# Hii Chii Kok
# v
# Ooi Peng Jin London Lucien and another

**[2016] SGHC 21**

High Court — Suit No 806 of 2012
Chan Seng Onn J
23, 29, 30 April; 6–9 May; 30 September; 1–3, 28–31 October 2014; 25–27 August; 2–4, 8–9, 14–16 September; 27 November 2015

Tort — Negligence — Breach of duty

Tort — Negligence — Causation

22 February 2016 Judgment reserved.

**Chan Seng Onn J:**

## Introduction

1 A number of factors collectively suggested to a multi-disciplinary team of physicians with sub-specialty skills at the medical centre of the 2nd defendant, the National Cancer Centre of Singapore Pte Ltd ("NCCS"), that the plaintiff, Dato' Seri Hii Chii Kok, *might* have neuroendocrine tumours ("NETs") in his pancreas at two locations, *viz*, the body of his pancreas ("the PB lesion") and the uncinate process of his pancreas ("the PU lesion"). They diagnosed him with pancreatic NETs ("PNETs"). This diagnosis shall be referred to as "the clinical diagnosis". They were, at the same time, alive to the possibility that the plaintiff might be suffering from a *very rare* but less serious

condition known as pancreatic polypeptide hyperplasia ("hyperplasia"), particularly in relation to the PU lesion. This diagnosis shall be referred to as "the differential diagnosis". The consensus opinion of all the experts who testified at the trial was that the most definitive way to tell PNETs apart from hyperplasia is through post-operative histopathology. Having analysed the consensus opinion of the experts, I have no reason to believe that there is a diagnostic tool or investigative procedure that is able to differentiate between these two conditions pre-operatively.

2 The plaintiff was informed of both the clinical diagnosis and differential diagnosis ("the diagnoses"), as well as his options flowing therefrom. The NCCS highlighted that the plaintiff had the option of waiting for six months or surgically resecting the PB lesion and the PU lesion (collectively, "the pancreatic lesions"). He consulted the 1st defendant, Professor Ooi Peng Jin London Lucien ("Prof Ooi"), to ascertain if the pancreatic lesions could be surgically resected. Prof Ooi found that the lesions could be removed via a Whipple procedure for the PU lesion and a surgical resection for the PB lesion ("the Whipple Surgery").

3 Having considered his options and the risks they each carried, the plaintiff decided that he wanted "aggressive treatment" and decided to proceed with the Whipple Surgery. Alas, it was found through post-operative histopathology that the plaintiff suffered from the *rare* condition of hyperplasia in the pancreatic lesions and did not have PNETs.

4 Notwithstanding his desire for "aggressive treatment", the plaintiff now turns around and sues Prof Ooi and the NCCS ("the defendants") for negligence

in relation to the diagnoses of his condition and the advice rendered to and their post-operative management of him.

5 The law on medical negligence is set out in the decision of the Court of Appeal in *Khoo James and another v Gunapathy d/o Muniandy and another appeal* [2002] 1 SLR(R) 1024 ("*Khoo James v Gunapathy*"). Singapore law currently follows the position set out in the English decision of *Bolam v Friern Hospital Management Committee* [1957] 1 WLR 582 ("*Bolam*" or "*Bolam* test") as supplemented by *Bolitho v City and Hackney Health Authority* [1998] AC 232 ("*Bolitho*" or "*Bolitho* test") (together, "the *Bolam – Bolitho* test"). The *Bolam – Bolitho* test applies clearly to the question of diagnosis and treatment. It has been argued before the High Court on at least three occasions in *Surender Singh s/o Jagdish Singh and another (administrators of the estate of Narindar Kaur d/o Sarwan Singh, deceased) v Li Man Kay and others* [2010] 1 SLR 428; *D'Conceicao Jeanie Doris (administratrix of the estate of Milakov Steven, deceased) v Tong Ming Chuan* [2011] SGHC 193; and *Tong Seok May Joanne v Yau Hok Man Gordon* [2013] 2 SLR 18 that the doctrine of informed consent should apply instead of the *Bolam – Bolitho* test to the question of whether a doctor has been negligent in his advice to the patient as regards material risks and alternative treatment options. It was noted in all these decisions that the High Court is bound by *Khoo James v Gunapathy* to apply the *Bolam – Bolitho* test in relation to the question of medical advice. I am of a similar view.

6 English law has moved away from the *Bolam – Bolitho* test and now applies the doctrine of informed consent in assessing whether a doctor has been negligent as regards the disclosure of material risks and alternative treatment options to the patient. The law as it stands in England is set out in the landmark decision of *Montgomery v Lanarkshire Health Board (General Medical Council*

*intervening)* [2015] AC 1430 ("*Montgomery*"). The UK Supreme Court ("UKSC") in *Montgomery* was of the view that the law has to move away from medical paternalism and adopt a more patient-centric approach to the issues of medical advice and informed consent. Such an approach is also found in Australian, Canadian and Malaysian law. The two different approaches set out in *Montgomery* and the *Bolam – Bolitho* test respectively are each backed by philosophers *par excellence*. Plato advocates (as a tool of persuasion) that a physician has a dialogue with the patient, "imparts instructions to them, so far as possible" and "gives no prescription until he has gained the patient's consent" (see Plato, *Laws IV*, section 720(d)). Hippocrates, on the other hand, expressly injuncts the physician against revealing every risk to the patient (see Hippocrates, *Decorum XVI*, 296 – 299). It remains to be decided if Singapore law should follow the approach in *Montgomery*.

7 Applying the *Bolam – Bolitho* test in the present case, as I must, I find that the defendants were not negligent in reaching the diagnoses and in their advice rendered to the plaintiff, and that Prof Ooi was also not negligent in the post-operative management of the plaintiff. Even if I were to apply the approach in *Montgomery* to analyse whether the defendants took reasonable care to ensure that the plaintiff was aware of any material risks involved in the Whipple Surgery and of any reasonable alternative or variant treatments, I would still find that the defendants had not been negligent.

## The facts

8 That plaintiff is a Malaysian businessman. He is the founder and Executive Chairman of a conglomerate involved in several diversified business areas and the controlling shareholder of a private education provider in

Malaysia. The plaintiff holds a law degree and was an English language journalist at some point during his career.

9 Prof Ooi is a surgeon specialising in hepatobiliary and pancreatic ("HPB") surgery as well as surgical oncology. He is the Chairman of the Division of Surgery and a Senior Consultant Surgeon at the Singapore General Hospital ("SGH"). He holds a concurrent appointment as Senior Consultant at the NCCS. Prof Ooi has performed over 250 pancreatic operations to date.

10 The NCCS manages a specialist oncology centre that provides outpatient specialist care for cancer patients. Of the cases that are managed by the NCCS, those which raise complex and novel medical issues are referred to a tumour board comprising a multi-disciplinary team of doctors with the relevant sub-specialty skills ("the Tumour Board"). The members of the Tumour Board discuss and consider the factors relevant to a case to, *inter alia*, reach a diagnosis and determine the treatment options.

***The plaintiff's medical history***

11 Between 2002 and 2010, the plaintiff consulted various doctors in Malaysia relating to medical problems concerning his lungs, thyroid and prostate. He underwent surgery for hyperthyroidism in 2000. In 2003, it was discovered that there were nodules in his lungs. Sometime on or around 23 November 2006, the plaintiff experienced pain in his left shoulder and underwent a chest x-ray at the Sime Darby Medical Centre ("SDMC") at Selangor, Malaysia. The x-ray showed an oval-shaped solid 12mm nodule in the lateral segment of the right middle lobe of the lung ("the lung nodule"). The lung nodule grew to 18mm by 17 June 2010. Histopathological analysis of the tissue obtained from the right lung nodule via a computed tomography-guided

biopsy, performed in Malaysia on 8 July 2010, identified the lung nodule to be a NET of low grade malignancy ("the lung NET").

12 On 13 July 2010, the plaintiff consulted Dr Foo Yoke Ching ("Dr Foo YC"), a medical oncologist at SDMC, regarding the treatment of the lung NET. She diagnosed the plaintiff as suffering from neuroendocrine carcinoma of the right lung. Dr Foo YC took the view that it was advisable for the plaintiff to undergo a "radioisotope Gallium scan" in Singapore to further investigate his condition. To this end, Dr Foo YC referred the plaintiff to Dr Koo Wen Hsin ("Dr Koo"), a medical oncologist at the NCCS, for investigation of the lung NET. In her email to Dr Koo, Dr Foo YC stated, *inter alia*, that "[the plaintiff] is keen to have surgery in Singapore. I would be grateful if you can advise him".[1]

13 On 19 July 2010, a positron emission tomography ("PET") scan using a radioisotope Gallium68 tagged with DOTATATE ("Gallium scan") combined with an x-ray computed tomography ("CT") scan was performed on the plaintiff by Dr Andrew Tan ("Dr Tan"), a nuclear medicine physician at the SGH. The Gallium scan performed on the plaintiff will be referred to singly as "the plaintiff's Gallium scan". The two combined scans will be referred to as the "the plaintiff's Gallium PET/CT" scan. The results of the plaintiff's Gallium PET/CT scan may be summarised as follows:[2]

(a) very minimal tracer avidity ("tracer uptake") in the right lung nodule (Standardised Uptake Values ("SUV") max 0.8);

[1] Dr Koo's AEIC, p 28.

[2] Dr Koo's AEIC, p 17-18.

(b) other visualised sub-centimetre lung nodules bilaterally but without any significant tracer uptake;

(c) focal areas of increased tracer uptake in the pancreatic uncinate process (SUVmax 23.0) and in the pancreatic body (SUVmax 13.2), with no definite corresponding mass or soft tissue thickening seen;

(d) mildly increased tracer uptake in the thyroid parenchyma, which may be secondary to hyperplasia; and

(e) physiological type uptake in the pituitary, liver, spleen, kidneys and adrenals.

14 The plaintiff requested for advice from Dr Tan on the findings of the plaintiff's Gallium PET/CT scan. Dr Tan informed the plaintiff that the increased tracer uptake in the pancreatic lesions could suggest the existence of PNETs. However, as no definite mass was seen in the plaintiff's Gallium PET/CT scan, Dr Tan advised him to further undergo a contrast enhanced CT scan or a magnetic resonance imaging scan ("MRI scan").

15 On the very next day, the plaintiff went back to SDMC and an MRI scan ("the plaintiff's MRI scan") was performed on him to ascertain if any mass was visible in the pancreatic lesions. The plaintiff's MRI scan revealed no mass in the pancreatic lesions of the plaintiff. On 21 July 2010, the plaintiff saw Dr Foo YC to update her on the plaintiff's Gallium PET/CT scan and the plaintiff's MRI scan.

16 The plaintiff was informed by Dr Tan on 22 July 2010 that his case was to be discussed by the Tumour Board on 29 July 2010 so as to obtain a consensus on the plaintiff's clinical diagnosis and the relevant courses of action he might

be able to pursue. Dr Tan also explained that the discrepant findings between the plaintiff's Gallium scan and the plaintiff's MRI scan were not uncommon due to the fact that the Gallium scan looks at cellular function whereas the MRI scan or CT scan looks at anatomy. As a result, the Gallium scan may pick up cellular abnormalities even in instances where no anatomical changes have occurred.

17 The plaintiff nevertheless went to the NCCS on 22 July 2010 with his friend, Dato' Diong Tak Chong ("Dato' Diong"). Dato' Diong had arranged a consultation for the plaintiff with Dr Darren Lim ("Dr Lim"), a senior consultant oncologist at the NCCS. Dr Lim documented a diagnosis of NETs with reference to the parathyroid, lung and pancreas. Dr Lim's opinion was for the lung NET to be treated with ablation/surgery and for the PNETs to be treated with octreotide.

18 The plaintiff then consulted Dr Koo. After reviewing the entire medical history of the plaintiff and all the scans taken up till that point, Dr Koo arrived at a diagnosis that the plaintiff had a primary PNET with secondary metastasis to the lung since 2003. Dr Koo's evidence was that in arriving at his diagnosis, he considered: (1) the increased tracer uptake in the plaintiff's Gallium scan at the pancreatic lesions; (2) the histopathological diagnosis that the right lung nodule was a NET; (3) the gradual increase in the size of the right lung nodule; and (4) the multiple small well-circumscribed nodules in the periphery of the lungs.

19 Dr Koo's opinion was that notwithstanding the indolent clinical picture, surgery of the pancreatic lesions might still present the best chance of cure from PNETs. Dr Koo then referred the plaintiff to Prof Ooi for review and

consideration of the indications and feasibility of surgery. I note from an email sent by Dr Koo to Dr Foo YC after the consultation with the plaintiff that he had put before the plaintiff three options (1) octreotide treatment, (2) radiopharmaceutical treatment and (3) surgery. His analysis of the three options was as follows:[3]

(a) If the objective was a complete eradication of NETs, then octreotide treatment would not achieve a cure.

(b) Radiopharmaceutical treatment was usually reserved for unresectable lesions and required the patient to go to Europe for repeated therapy sessions.

(c) Of the three options, surgery was "not unreasonable", as there might hopefully be no or slow recurrence.

***The plaintiff's consultation on 22 July 2010 with Prof Ooi and Prof Ooi's advice***

20 The plaintiff met Prof Ooi at about 3.10pm on the same day *ie*, 22 July 2010. The plaintiff asserted at trial that Prof Ooi only told him once orally (and that was during this consultation) that he *definitely* suffered from cancer in the pancreas[4] and that surgery was the *only* option that the plaintiff should pursue.[5] This was however categorically denied by Prof Ooi. I note from the email sent by Dr Koo to Dr Foo YC that the purpose behind sending the plaintiff to Prof Ooi was to ascertain if the pancreatic lesions were resectable. Notwithstanding

[3] Dr Koo's AEIC, p 27.

[4] Transcript dated 29 April 2014, p 98 and 115.

[5] Transcript dated 29 April 2014, p 152

the differences between Prof Ooi and the plaintiff's versions on what was said during the consultation, it was acknowledged by the plaintiff that by the end of the consultation, he knew that the Whipple Surgery (that was recommended by Prof Ooi) was a major surgery; he knew that there was an associated mortality risk of 5%; and Prof Ooi had discussed with him the limitations of pre-operative biopsy. Prof Ooi's contemporaneous outpatient medical records of his consultation with the plaintiff were divided into sections.[6] He recorded the medical history of the plaintiff, the result of the scans performed on him, the surgical options in relation to the pancreas, a diagrammatic illustration of the Whipple Surgery, the surgical and anaesthetic risks and the treatment options (including non-surgical options).

21 Based on the above, it appears that Prof Ooi had explained and/or discussed the following during the consultation with the plaintiff:

(a) two surgical options of (i) a localised pancreatic resection of the PB lesion combined with a Whipple procedure to remove the PU lesion (*ie*, the Whipple Surgery); or (ii) a total pancreatectomy (removal of the entire pancreas);

(b) how the resection and anastomosis in relation to the pancreatic surgery would be performed (with illustrations);

(c) the two sets of risks associated with surgery, those associated with general anaesthesia and those associated with the surgery;

(d) the risk of mortality was less than 5%; and

[6] Prof Ooi's AEIC, pp 168 – 171.

(e) the other non-surgical treatment options of radionuclear treatment and chemotherapy, as well as the palliative nature of chemotherapy.

22 At trial, the plaintiff contended that the consultation with Prof Ooi was "*less than 15 minutes*" and that the detailed discussion noted above could not have taken place in that limited time.[7] He however recalled Prof Ooi diagrammatically illustrating what the surgery entailed on a blank sheet of A4 size paper and that the entire discussion filled many pages.[8] Later, the plaintiff admitted that he could not recall how long his consultation with Prof Ooi lasted but he thought that it lasted for 15 minutes or at most 20 minutes.[9] Prof Ooi stated that the consultation lasted for about 45 minutes. When it was pointed out by counsel for Prof Ooi to the plaintiff that there was a good 71-minute lapse between the time the plaintiff consulted Prof Ooi, *viz*, 3.10pm, and the time the plaintiff paid the bill at the counter of the NCCS, *viz*, 4.21pm, the plaintiff said that he went for a drink with Dato' Diong at the café "downstairs" just outside or nearby the NCCS building prior to the payment of the bill.[10] When counsel for Prof Ooi suggested that it was not likely that he would have left the NCCS building even before paying the bill, particularly, as he was rushing for a flight at 5.25pm that day,[11] the plaintiff said that Dato' Diong helped him to pay the bill.

[7] Transcript dated 23 April 2014, pp 146 –147.

[8] Transcript dated 29 April 2014, p 102 – 103.

[9] Transcript dated 29 April 2014, pp 102 – 103.

[10] Transcript dated 29 April 2014, p 103.

[11] Transcript dated 29 April 2014, p 100.

23 I do not believe that the plaintiff would have gone for a leisurely drink with Dato' Diong before payment of the bill. It is more likely that he would have paid the bill soon after the conclusion of the consultation with Prof Ooi and then rush to the airport to catch his flight. I am more inclined to accept Prof Ooi's evidence that special arrangements had been made to accommodate the plaintiff's appointment on that day and he had no other patients to attend to after the plaintiff. Therefore, Prof Ooi was able to provide more time for consultation. I accept Prof Ooi's evidence that the consultation lasted much longer than suggested by the plaintiff and there was sufficient time for Prof Ooi to go through with the plaintiff the various details, and provide the explanation and advice as evidenced by the medical notes recorded contemporaneously by Prof Ooi during the consultation. I do not accept the plaintiff's contention that these contemporaneous medical notes were not genuine. On a balance of probabilities, I find that Prof Ooi did have a lengthy consultation with the plaintiff where the matters stated at [21] above were discussed.

24 On the question whether Prof Ooi had misled the plaintiff during the consultation on 22 July 2010 into believing that he *definitely* suffered from cancer in the pancreas[12] and that surgery was the *only* option,[13] I note that the contents of the emails and correspondence point consistently in the opposite direction. The emails in relation to (i) seeking a second medical opinion from a private oncologist and (ii) obtaining further clarifications and discussing what further tests and investigations ought to be or could be done in order to verify if the PU lesion was a PNET or hyperplasia would defy logic if it were true that the diagnosis indicated by the defendants, and in particular Prof Ooi, was

[12] Transcript dated 29 April 2014, p 98 and 115.

[13] Transcript dated 29 April 2014, p 152

already so certain and conclusive as alleged by the plaintiff, *viz*, that he was *definitely* suffering from cancer in the pancreas. There was much prevarication when the plaintiff was pointedly asked questions during cross-examination whether Prof Ooi had in fact told him that he definitely had cancer or neuroendocrine cancer. I do not believe that Prof Ooi, as an experienced consultant of many years (since 1997) specialising in HPB and pancreatic surgery and a senior surgical consultant at the NCCS, a specialist medical centre for cancers, would have loosely used the term "cancer" when he meant a "tumour" or that he would have used those terms so interchangeably as the plaintiff had suggested during his prevarications. For Prof Ooi as a specialist in his field, the words "cancer" and "tumour" mean very different things, and it is not likely for him to misuse those terms or use them interchangeably. I further note that the plaintiff never complained orally or in writing to either of the defendants soon after learning that there was no cancer or PNET found in the post-operative specimens of his pancreas by the SGH histopathologist. This strongly suggests to me that the defendants had at no time informed the plaintiff of any *definitive* diagnosis of cancer or neuroendocrine cancer. Dato' Diong, who was present with the plaintiff at the 22 July 2010 consultation with Prof Ooi, also never mentioned in his affidavit of evidence-in-chief ("AEIC") that Prof Ooi had informed the plaintiff that he definitely had cancer or neuroendocrine cancer in his pancreas, which accords with the position of Prof Ooi. On evaluating the entirety of the evidence, I find that the plaintiff was never told at any time by the defendants that he suffered or *definitely* suffered from cancer or neuroendocrine cancer, or that surgery was the *only* option that he should pursue, both of which either in combination or singly had allegedly caused him to give his consent for the Whipple Surgery.

25 I go further to find that it is also unlikely that the plaintiff would have misunderstood what Prof Ooi had told him and mistakenly believed that he had "cancer of the neuroendocrine type"[14] after his consultation with Prof Ooi. This is because the plaintiff had asked relevant questions and sought relevant clarifications via email on essentially why the clinical diagnosis of PNETs could not be made more definitive by ruling out hyperplasia. With the undisputed emails clearly evidencing that there was never mention of any diagnosis of cancer or neuroendocrine cancer, I am driven inexorably to find that the defendants, and in particular Prof Ooi, had never misinformed the plaintiff of that alleged definitive diagnosis and that no such definitive or conclusive diagnosis of cancer or neuroendocrine cancer was ever made. I will further elaborate on my reasons for this finding under the sub-section of this judgment entitled "The defendant was not informed or advised that he had pancreatic cancer" (see [90] – [98] below).

26 On 23 July 2010, Dr Tan sent an email to the plaintiff at 3.21pm. He recommended that the plaintiff wait till 29 July 2010 for the consensus opinion of the Tumour Board before making any decision.

27 The plaintiff then emailed Prof Ooi at 4.56pm. The subject of the email was "*Neuroendocrine tumours of the pancreas*". He stated that he and his family were trying to "absorb the technicalities" of his case and that he was agreeable in principle to Prof Ooi's recommendation "for surgery on [the plaintiff's] pancreas to remove the two tumours", and would "revert" to him in the week to follow up as to the proposed dates in August 2010 for surgery.[15] Prof Ooi replied

[14] Transcript dated 29 April 2014, p 115

[15] 1 DCB 79.

that he would wait for the plaintiff's decision. As pointed out by counsel for the NCCS, although the plaintiff had insisted in his testimony at trial that both Dr Koo and Prof Ooi told him he had "pancreatic cancer", his own emails demonstrate that he was well aware of the appropriate terminology when discussing his situation with the relevant doctors.

28 On the following day, the plaintiff replied to the email that Dr Tan sent on 23 July 2010. The plaintiff agreed that his case was clinically uncertain and stated that although Prof Ooi recommended surgery, he was all for "aggressive treatment" and believed that Prof Ooi had "the expertise and experience to give sound advice and perform the surgery well". However, he stated that he was still concerned about the discrepant findings between the plaintiff's Gallium scan and the plaintiff's MRI scan. He was therefore waiting for the opinion of the Tumour Board so as to make a "more informed decision on the way forward".[16]

29 I pause to note that, apart from the indications in the plaintiff's Gallium scan of some abnormality in his pancreas, the plaintiff had been having diarrhoea three to four times a day and had undergone a previous sub-total thyroidectomy for thyrotoxicosis 15 years ago.

***The Tumour Board's Diagnoses and Advice***

30 Thus far, the plaintiff had received a clinical diagnosis from Dr Koo that he had a primary PNET with secondary metastasis to the lung. Of the three options set out to him, surgery was recommended. The plaintiff was then told by Prof Ooi that surgery was feasible. It was Dr Koo's evidence that, since he

[16] Dr Tan's AEIC, p 26.

found the plaintiff's case interesting and complex, he recommended that it be put before the Tumour Board for a consensus opinion. The plaintiff knew that the Tumour Board would be reviewing his case on 29 July 2010 and was asked by Dr Tan to wait for the consensus opinion of the Tumour Board.

31 The Tumour Board met on 29 July 2010. The individuals present and their respective disciplines are summarised in the table below:

| **Name** | **Discipline** |
|---|---|
| Dr Koo | Medical oncology |
| Dr Donald Poon | Medical oncology |
| Dr Tan | Radiology/nuclear medicine |
| Dr Pierce Chow | Surgical oncology (HPB speciality) |
| Dr Jacqueline | Pathology |

32 The Tumour Board decided on a number of issues including a differential diagnosis of hyperplasia and the utility of obtaining a biopsy. After the Tumour Board developed its consensus opinion ("the Tumour Board's Diagnoses and Advice"), Dr Tan updated the plaintiff on the Tumour Board's Diagnoses and Advice, as he had by then been in constant communication with the plaintiff. Dr Tan wrote to the plaintiff as follows:[17]

[17] 6 AB 190.

> Hi [Dato' Hii]
>
> We have just finished the [Tumour Board] meeting, and I thought I might update you on the consensus[.]
>
> 1. The impression is that the pancreas lesion and right lung lesion are 2 separate entities or primaries.
>
> 2. The lung lesion is known to be slow growing and well differentiated type [NET], and surgical options are fairly straight forward.
>
> 3. The pancreas lesion is more troublesome. The impression is that the pancreas lesions are real despite negative MRI and CT findings, and these are of increased importance as compared with the lung lesion, as it is appreciated that pancreatic neuroendocrine lesions have a higher propensity for spread.
>
> 4. The current risk of spread or metastasis is not known. The [PB lesion] measures 1.5cm based on the PET SUV outline.
>
> 5. In regards to the [PU lesion], it can represent a [NET] or [hyperplasia]. Current literature is yet uncertain on the significance of such uncinate somatostatin uptake.
>
> 6. The consensus is for removal of the [PB lesion]. The [PU lesion] is more uncertain, as the surgical side-effects/morbidity may be higher. You might want to discuss the surgical options with [Prof Ooi].
>
> 7. The second option is to wait and repeat another scan in about 6 months.
>
> 8. [It is] a balance of risk of possible [tumour] growth/spread versus surgical risks.
>
> I hope this may give you a clearer picture of your options. Do feel free to contact me if you have any other queries. Also, if you want to speak to other patients regarding [NETs], I can put you in touch with a patient advocacy group that we are in close contact with.
>
> [Note: "PET SUV outline" above refers to Positron Emission Tomography Standardised Uptake Values outline.]

33 Based on the Tumour Board's Diagnoses and Advice, it is clear that the Tumour Board was of the view that the PB lesion was likely to represent a NET while the PU lesion could either be a NET or hyperplasia. The Tumour Board

then provided the plaintiff with the option of (1) waiting for six months; or (2) resecting the PB lesion and discussing the surgical options in relation to the PU lesion with Prof Ooi.

34 I note that Dr Koo also sent an email to Dr Foo YC to update her on the situation. This email was also copied to the plaintiff. In that email, Dr Koo set out the deliberations of the Tumour Board, albeit in less amount of detail.

***Prof Ooi's further advice and the plaintiff's decision to proceed with the Whipple Surgery***

35 The plaintiff thereafter forwarded the Tumour Board's Diagnoses and Advice to Prof Ooi to ask for his further opinion. Prof Ooi replied as follows:[18]

> (a) "*[A]s what we have previously discussed*", the pancreatic lesions should be addressed as a priority given that the growth and activity of the lung lesions were slower than the pancreatic lesions.
>
> (b) It was difficult to conclude whether the PB lesion and PU lesion represented NETs or hyperplasia from the plaintiff's Gallium PET/CT scan, as both lesions lit up on the plaintiff's Gallium scan. However, he felt that if they had to remove one of the pancreatic lesions they should also remove the other as it would not make sense to remove only one lesion.
>
> (c) "*[A]s we previously discussed*", waiting six months for a repeat scan was an option, but the plaintiff would need to accept the risk of the

[18] 6 AB 186 – 187.

pancreatic lesions turning out to be tumours with a potential of metastasis while waiting.

(d) The surgical morbidity and mortality of the Whipple Surgery would be higher than for the removal of the PB lesion alone in general, but surgeon and patient factors should also be taken into consideration.

(e) Younger and fitter patients, experienced surgeons and centres with higher volume of cases have better outcomes.

(f) "*[A]s explained to [the plaintiff] at the consultation, [when they went] through the surgical procedure and risks*" of the Whipple Surgery, while the Whipple Surgery carried risks, the plaintiff happened to be a good risk candidate in terms of expected outcome.

(g) He would be happy to proceed with the Whipple Surgery if the plaintiff was agreeable, or to discuss further on whether he wanted to leave one tumour (presumably, that which was supposedly in the PU lesion) and remove the other.

36 I note that this email explicitly referred to some of the discussions that Prof Ooi had with the plaintiff during the previous consultation on 22 July 2010, which buttresses Prof Ooi's position that he had an extensive discussion with the plaintiff which he had contemporaneously recorded in his medical notes. The plaintiff replied to Prof Ooi's email and stated that "all things considered", he wanted both the pancreatic lesions to be removed. He also stated that he preferred "option 2" (*ie*, surgery) of the two options set out in the Tumour Board's Diagnoses and Advice. Arrangements were then made for the plaintiff to arrive in Singapore on 13 August 2010, and have the Whipple Surgery performed by Prof Ooi on 16 August 2010.

***The plaintiff sought further clarification before surgery***

37 The plaintiff could appreciate that there was significant uncertainty involved in his case as none of the diagnostic tools apart from the Gallium scan could tell with a high degree of certainty that he had PNETs. He was cognisant of the clinical diagnosis and the differential diagnosis in the Tumour Board's Diagnoses and Advice. However, he had considered the risk of waiting for six months to observe any developments and decided to proceed with surgery instead. Nevertheless, on 8 August 2010, the plaintiff emailed Dr Tan for further clarification.[19] He asked why the Tumour Board felt that the PB lesion was more definitely a PNET, whereas it was not sure that the PU lesion was a PNET or hyperplasia. This clearly showed that the plaintiff had carefully read and understood the Tumour Board's Diagnoses and Advice as had been conveyed to him. In fact, the plaintiff admitted that he understood the contents of the email from Dr Tan that updated him of the Tumour Board's Diagnoses and Advice.

38 Dr Tan replied later that day explaining that there were always limitations with diagnostic imaging, and there would be percentages of false positives or false negatives.[20] Dr Tan also explained that in the case of a Gallium scan, the concern generally was more with false negatives. He pointed out that the Tumour Board did discuss if the PB lesion could have been a false positive, but eventually concluded with confidence that the lesion was real as the scan findings were in their view quite clear. Dr Tan also explained that there was uncertainty relating to the PU lesion as the tracer uptake could be due to hyperplasia. However, he noted that the literature was not very conclusive on this. Dr Tan pointed out that the tracer uptake in the plaintiff's PU lesion was

[19] 6 AB 193.

[20] 6 AB 193.

higher than what was expected even accounting for the possibility of hyperplasia, but nevertheless it could not be conclusively characterised as a PNET.

39 On 9 August 2010, the plaintiff emailed Dr Tan again.[21] This time, the plaintiff said he had been advised to undergo an Endoscopic Ultrasound ("EUS") and asked Dr Tan if arrangements could be made for him to undergo such an investigation. The plaintiff did not mention whom he received the advice from. Dr Tan replied on the same day and advised the plaintiff to seek a second opinion from Dr Tan Yu Meng ("Dr Tan YM"), a senior consultant oncologic surgeon previously with the NCCS but now in private practice. Dr Tan expressed the opinion that an EUS alone might not be conclusive, and the plaintiff could consider an EUS guided needle biopsy or an Endoscopic Retrograde Cholangiopancreatography ("ERCP") guided biopsy if that option was technically feasible.

40 On 10 August 2010, the plaintiff emailed Prof Ooi to ask about an EUS guided Fine Needle Aspiration biopsy ("EUS-FNA"). Prof Ooi replied on the same day, and explained that the results of an EUS-FNA would only be useful if the results were positive. A negative result would not lead to a conclusion that it was safe to leave the pancreatic lesions alone. In Prof Ooi's opinion, there was a slight risk with an EUS-FNA and it was also not beneficial in the plaintiff's situation.[22]

41 On 12 August 2010, the plaintiff emailed Dr Tan again. The plaintiff said that he had been advised that an EUS-FNA would only be useful if it was

[21]6 AB 196 – 197.

[22]6 AB 194.

positive and it would be unwise to leave the lesions alone even if the results of the EUS-FNA were negative.[23] Dr Tan replied on the same day. He stated as follows in his reply:[24]

(a) The EUS-FNA would be useful if the findings were positive.

(b) He explained the use of the term "carcinoids" and "carcinoma" in relation to the lung lesions, and that the plaintiff's lung lesions were classified as "carcinoids".

(c) As regards surgical options, Dr Tan stated that his personal opinion was that subject to technical feasibility, it would be best for the PB lesion to be resected with biopsy of the PU lesion.

(d) He stated that he had personal reservations on the significance of the PU lesion as it could be hyperplasia and the Whipple Surgery was a major procedure.

(e) He invited the plaintiff to speak with Dr Tan YM if he wanted a second opinion on the surgical options.

42 Therefore, before the plaintiff proceeded for surgery, I find that he was made fully aware and he understood that the PU lesion could turn out to be hyperplasia instead of a PNET, and a negative result obtained from an EUS-FNA would not negate the chance that the PU lesion might be a PNET instead of hyperplasia.

[23] 6 AB 196.

[24] 6 AB 195 – 196.

***The Whipple Surgery***

43 I note from Prof Ooi's outpatient medical records that the plaintiff consulted with him again on 13 August 2010. The plaintiff was accompanied by his wife, son and friend. Prof Ooi stated that he discussed with the plaintiff the option of delaying the surgery and monitoring the pancreatic lesions and, in relation to surgical options, to resect only the PB lesion or both the pancreatic lesions. According to Prof Ooi, the plaintiff decided to have both the pancreatic lesions removed. The plaintiff, however, stated that the consultation was brief and Prof Ooi informed him that he would "carry out the surgery to remove both the cancerous lesions" in the plaintiff's pancreas.[25]

44 The plaintiff had by this time the benefit of the Tumour Board's Diagnoses and Advice (see [32] and [33] above), which Dr Tan had clearly set out and explained to him. The plaintiff also had the benefit of the views and the detailed advice set out in several of Dr Tan's emails to him. I find that Prof Ooi had also made clear to him the surgical and non-surgical options and the implications of those options (see [20] and [21] above). Additionally, he also knew that the clinical diagnosis was that of PNETs (and not "cancer" or "pancreatic cancer") and had carefully referred to PNETS in his correspondence with Prof Ooi (see [27] above). I find that the plaintiff had been informed of all the various options open to him and the advantages and disadvantages of each option. He had sought clarifications when needed and was promptly provided with the clarifications that he needed to decide on which option to take. He was even advised that he could seek a second opinion from Dr Tan YM, a private oncologist and surgeon. After carefully reviewing all his options, the plaintiff decided to proceed with resection of both the pancreatic lesions. He also

[25] The plaintiff's AEIC, para 60.

concluded that proceeding with the EUS-FNA and obtaining a negative result would not significantly change the considerations or indications for surgery as there remained a real risk that the PU lesion might be a PNET instead of hyperplasia.

45 On the morning of 16 August 2010, the plaintiff was admitted to the SGH[26]. The plaintiff consented in writing to undergo a "*Whipple's Procedure + Resection of body tumour*"[27] *ie*, the Whipple Surgery. The Whipple Surgery, which was carried out by Prof Ooi, commenced at 10.30am.

46 During the operation, Prof Ooi mobilised the plaintiff's pancreatic head to allow for proper examination. Prior to the actual resection, Prof Ooi examined the pancreas using (a) bimanual palpation ("palpation"), which is a form of physical examination performed on the pancreas; and (b) intraoperative ultrasound ("IOUS"). The palpation detected two distinct areas of induration (hardening that is distinct from the surrounding tissues) that corresponded to the two areas of increased tracer uptake on the plaintiff's Gallium scan. Using palpation, the PU lesion was estimated to be 2cm, and the PB lesion was estimated to be 1cm by 0.5cm. This corresponded with the estimated sizes of the alleged PNETs on the plaintiff's Gallium scan. The IOUS did not show any distinct lesions.

47 Prior to closure, two surgical drains, *viz*, the right surgical drain and the left surgical drain, were placed to allow post-operative secretions to drain externally, and to monitor for potential problems that might arise following the Whipple Surgery. The Whipple Surgery took about 4 hours and 50 minutes. The

[26] 1 AB 76.

[27] 1 AB 94 –95.

pancreatic lesions identified on the plaintiff's Gallium scan were successfully removed and there were no adverse events intraoperatively.

48 The resected specimens (consisting of the PU lesion, bile duct, distal stomach and duodenum) and the separate excised PB lesion were sent for histopathological examination on 16 August 2010. The histopathology results dated 26 August 2010 reported that the "*appearances are suggestive of islet cell hyperplasia*" and the "*possibility of multiple microadenomas was considered in the differential diagnosis*".[28]

***Post-operative care and subsequent complications***

49 After the surgery, the plaintiff was managed as an inpatient during the period from 16 to 27 August 2010 ("the post-operative period"). The plaintiff stated that he experienced considerable pain during the first three days of surgery and that the surgical drains were continuously draining fluids. He also stated that he suffered from nausea and vomiting prior to his discharge.

50 The plaintiff was reviewed by members of the medical and nursing staff and Prof Ooi during the post-operative period. Prof Ooi gave detailed evidence of the plaintiff's condition during the post-operative period. The condition of the plaintiff was summarised in the following manner in Prof Ooi's closing submissions:[29]

| **The relevant factor** | **Description** |
|---|---|

[28] 1AB 80 – 81.

[29] Prof Ooi's closing submissions dated 14 November 2015, para 51.

| | |
|---|---|
| Overall Condition | The plaintiff was well throughout the inpatient admission, save for a high pulse rate and low-grade fever in the immediate post-operative period, which was not unexpected after a major surgery. The plaintiff could be taken off morphine by post-operative day ("POD") three, and he was pain free thereafter except for some minor pain on POD five. Pain score remained at zero from POD six onwards. |
| Bowel continuity | The plaintiff was started on clear feeds on 24 August 2010 and progressed to a soft diet on 26 August 2010. The plaintiff was able to pass flatus and stools which represented bowel continuity and suggested no anastomotic leak or defect in the gastrointestinal tract. |
| Drain fluids | The drain fluids were non-bilious throughout the admission, indicating that there was no |

| | |
|---|---|
| | breakdown in the anastomoses. High fluid amylase found on POD four, pancreatic juice seen on POD nine, and high drainage volume showed that the plaintiff had a pancreatic fistula which was controlled, and which could be managed conservatively with drains. |
| Blood test indicators | The plaintiff's total white blood cell count and serum amylase levels were initially high (which was not unexpected after a major surgery) but trended downwards as expected. This suggested that there was no ongoing inflammation or infection. The haemoglobin and red cell count were also normal for a post-operative patient. |

51 The plaintiff was discharged on 27 August 2010. By the time of his discharge, the right surgical drain had been dry and was removed. Prof Ooi asserted that the plaintiff was clinically well at the time of discharge. The plaintiff was prescribed a two-week course of antibiotics and scheduled for an early follow-up appointment on 3 September 2010.

52 Even before the outpatient review on 3 September 2010, the plaintiff had, on 2 September 2010, consulted Dr Agasthian Thirugnanam ("Dr Agasthian") in relation to the removal of the lung NET.

53 During the outpatient review on 3 September 2010, it was noted that the plaintiff's serum amylase level and total white cell count were in the normal range, suggesting that there was no pancreatitis (inflammation) or infection. The plaintiff informed that he did not have fever or abdominal pain. He was also eating and passing motion well. The plaintiff informed Prof Ooi that his left drain had been dry for the past three days. Prof Ooi removed the left drain after confirming that the plaintiff's wound had healed well and that he had no abdominal symptoms.

54 The plaintiff emailed Dr Tan on 5 September 2010 to talk about surgical options in relation to his lung NET. Dr Tan replied on the same day. He stated that the plaintiff should focus on the recovery process. He also stated that the significance of hyperplasia in the pancreatic lesions was still not certain and that it might represent pre-tumourous lesions. He stated that it was good news that the pancreatic lesions were not overtly cancers based on the histopathology.

55 The plaintiff emailed Prof Ooi on 9 September 2010. He informed that the recovery process was well except that everything he ate tasted bitter. Prof Ooi replied to him that the bitter taste was due to the antibiotics that the plaintiff was consuming. There was some draining on the site of the Whipple Surgery on 13 September 2010. The plaintiff informed Prof Ooi of this. Prof Ooi informed the plaintiff via email that it would eventually dry.

56 On the night of 15 September 2010, the Plaintiff contacted Prof Ooi to say that he was vomiting blood. Prof Ooi advised the Plaintiff to seek urgent

medical attention. The plaintiff went to the SDMC on 15 September 2010. After a series of scans, the plaintiff underwent surgery on 16 September 2010 to remove necrotic tissue at the posterior wall of the stomach and for a revision gastro-jejunostomy ("the Second Surgery").

57 On 4 October 2010, the plaintiff was transferred from SDMC to Hospital Selayang in Kuala Lumpur ("Hospital Selayang"). At Hospital Selayang, a diagnosis of "hepaticojujenostomy anastomotic leak" was made and an exploratory laparotomy was performed on 20 October 2010 ("the Third Surgery"). Portions of the plaintiff's pancreas and the plaintiff's spleen were removed. The plaintiff was discharged from Hospital Selayang on 9 November 2010. It was stated in the outpatient record of Dr Krishnan Raman that the plaintiff remained well when he was last seen on 13 February 2012.

58 The plaintiff, however, claims that he continues to suffer from the after effects of the Second Surgery and Third Surgery that were performed on him as a result of the Whipple Surgery allegedly not being successful. The plaintiff states that his losses are as follows:

(a) he has to receive insulin administration four to five times a day after the three surgeries;

(b) he is unable to enjoy an active lifestyle and fully attend to his business, and has to maintain a strict diet;

(c) he has to visit the toilet frequently; and

(d) he continues to need medical review and care.

59 The plaintiff also highlights that he suffers pain, discomfort and other disabilities. There is no need for me to list these alleged losses in detail or analyse if each of them can be claimed at law. As the trial has been bifurcated, the real question to be answered here is whether Prof Ooi and/or the NCCS have in the present case fallen below the standard of care expected of them such that their liability in negligence is established. The same question has to be determined in relation to the plaintiff's alternative case against the NCCS for breach of contract.

**The issues**

60 It is uncontroversial that a doctor owes a duty of care to the patient and that both Prof Ooi and the NCCS would respectively owe the plaintiff a duty of care. The plaintiff alleges that the NCCS' duty of care extends beyond its involvement in the plaintiff's pre-surgical diagnosis and advice in this regard. He argues that by reason of some kind of a non-delegable duty, the NCCS' duty of care extended to the Whipple Surgery and the post-operative period. I must note at the outset that the existence of this non-delegable duty has not been properly pleaded by the plaintiff except from a vague allegation in the plaintiff's reply that "the [NCCS] was responsible for the medical treatment and care rendered to him at the behest of the [NCCS]". Nevertheless, given that I am of the view that the plaintiff would not succeed in proving that the NCCS owed him a non-delegable duty in relation to the Whipple Surgery and care extended during the post-operative period, I see no need to dismiss this allegation on the *sole* basis that it had not been properly pleaded.

61 By reason of the above, the following issues arise for consideration:

(a) whether the NCCS owed a non-delegable duty to the plaintiff in relation to the Whipple Surgery and care during the post-operative period;

(b) whether the defendants fell below the requisite standard of care in reaching their diagnoses of the plaintiff's condition;

(c) whether the defendants fell below the requisite standard of care in the advice they rendered to the plaintiff;

(d) whether Prof Ooi fell below the requisite standard of care in the care extended to the plaintiff during the post-operative period; and

(e) on the question of causation, whether the plaintiff would have changed his decision otherwise.

**The NCCS did not owe the plaintiff a non-delegable duty in relation to the Whipple Surgery and post-operative care**

62 The plaintiff argues that the NCCS owed a non-delegable duty to the plaintiff in relation to the Whipple Surgery and care during the post-operative period. The plaintiff relies on the decision of the UKSC in *Woodland v Swimming Teachers Association* [2014] AC 537 ("*Woodland*"), which was endorsed by the High Court in *BNM (administratrix of the estate of B, deceased) on her own behalf and on behalf of others v National University of Singapore and another* [2014] 2 SLR 258.

***The applicable legal principles***

63 In *Woodland*, the appellant was a ten-year old pupil attending swimming lessons organised by her school during school hours. The respondent-education

authority was responsible for the swimming lessons; however, an independent contractor provided a swimming teacher and a lifeguard. The independent contractor had contracted with the respondent to provide swimming lessons. During one such swimming lesson, the appellant got into difficulties and was found "hanging vertically in the water". She was resuscitated but suffered serious hypoxic brain injury. The appellant sued the respondent-education authority.

64 The respondent-education authority successfully struck out the plaintiff's claim before the English High Court on the basis that the respondent-education authority did not owe the appellant a non-delegable duty of care. The appellant's appeal of the decision of the High Court was dismissed by the English Court of Appeal. The UKSC then unanimously allowed the appeal. It held that the essential feature of a non-delegable duty of reasonable care was that a defendant had control over a vulnerable claimant for the purpose of performing a function for which the defendant had assumed responsibility. Since the case related to a striking out, the UKSC did not have to articulate whether the respondent-education authority had breached its duty of care. It only had to pronounce if it owed a non-delegable duty to the appellant. The UKSC ruled on this point in the affirmative (at [26]). It held that within school hours, the school was in such a position of responsibility and control over a pupil entrusted to it for certain integral functions that it owed a non-delegable duty to the pupil in carrying out those functions. The swimming lessons in that case was one such integral part of the school's teaching and supervisory functions. It would be *fair, just and reasonable* to hold a school liable for injury caused by the negligence of an independent contractor to whom it had delegated the teaching and supervisory functions and control over the pupil during the school day.

65 Lord Sumption noted (at [5]) that the law of negligence is generally fault-based. As a result, save for situations where vicarious liability is established, a person is generally only personally liable for his own negligent acts. His Lordship recognised that the expression "non-delegable duty" had become "the conventional way of describing those cases in which the ordinary principle is displaced and the duty extends beyond being careful, to procuring the careful performance of work delegated to others."

66 He then recognised two categories of non-delegable duties. The first category involves a class of cases in which the defendant employs an independent contractor to perform some function which is either inherently hazardous or liable to become so in the course of his work. Lord Sumption observed (at [6]) that this class of cases was "large, varied and anomalous". I record my agreement with Lord Sumption that this category of non-delegable duties should be founded on the special public policy *vis-à-vis* operations involving exceptional danger to the public. Imposing a non-delegable duty in such situations yields a net social benefit.

67 The second category articulated by Lord Sumption is relevant to the present factual matrix. He noted (at [7]):

> The second category of non-delegable duty … comprises cases where the common law imposes a duty on the defendant which has three critical characteristics. First, it arises not from the negligent character of the act itself but because of an antecedent relationship between the defendant and the claimant. Second, the duty is a positive or affirmative duty to protect a particular class of persons against a particular class of risks, and not simply a duty to refrain from acting in a way that foreseeably causes injury. Third, the duty is by virtue of that relationship personal to the defendant. The work required to perform such a duty may well be delegable, and usually is. But the duty itself remains the defendant's. Its delegation makes no difference to his legal responsibility for the proper

> performance of a duty which is in law his own. In these cases, the defendant is assuming a liability analogous to that assumed by a person who contracts to do work carefully. The contracting party will normally be taken to contract that the work will be done carefully by whomever he may get to do it…

68 Lord Sumption then identified (at [23]) the underlying principles upon which non-delegable duties of care should be imposed as follows:

> (a) The claimant is a patient or child, or for some other reason is especially vulnerable or dependent on the protection of the defendant against the risk of injury.
>
> (b) There is an antecedent relationship between the claimant and the defendant, independent of the negligent act or omission itself, (i) which places the claimant in the actual custody, charge or care of the defendant, and (ii) from which it is possible to impute to the defendant the assumption of a positive duty to protect the claimant from harm, and not just a duty to refrain from conduct which will foreseeably damage the claimant. It is characteristic of such relationships that they involve an element of control over the claimant, which varies in intensity from one situation to another.
>
> (c) The claimant has no control over how the defendant chooses to perform those obligations, *ie*, whether personally or through employees or through third parties.
>
> (d) The defendant has delegated to a third party some function which is an integral part of the positive duty which he has assumed towards the claimant; and the third party is exercising, for the purpose of the function thus delegated to him, the defendant's custody or care of the claimant and the element of control that goes with it.

(e) The third party has been negligent not in some collateral respect but in the performance of the very function assumed by the defendant and delegated by the defendant to him.

(together, "the *Woodland Principles*")

69 Lord Sumption also endorsed (at [24]) the decision of the English Court of Appeal in *Farraj v King's Healthcare NHS Trust* [2010] 1 WLR 2139 ("*Farraj*"). In *Farraj*, a hospital had employed an independent laboratory to analyse a tissue sample for a patient who was not being treated by the hospital. The patient was therefore not in its custody or care. Both the hospital and the laboratory were found to be negligent at first instance. However, the English Court of Appeal held that the hospital was not liable for the negligence as the patient was not under its custody or care. The rationale as noted by Dyson LJ (at [88]) in imposing non-delegable duties on hospitals is that the "hospital undertakes the care, supervision and control of its patients who are in special need of care".

70 Observing the formulation of the *Woodland Principles* and the view of the English Court of Appeal in *Farraj*, it appears that the existence of a non-delegable duty of a hospital for the functions it undertakes turns centrally on the responsibility for the care, supervision and control that it has assumed for those functions in relation to the patient, a vulnerable person who has placed himself under the hospital's direct care, supervision and control. In every case, however, it must be fair, just and reasonable to impose a non-delegable duty.

***Application of the Woodland Principles***

71 I set out the application of the relevant limbs of the *Woodland Principles* to the present case:

(a) As the plaintiff was a patient, he was vulnerable or dependent on the protection of the NCCS against the risk of injury.

(b) There was an antecedent relationship between the claimant and the NCCS independent of the Whipple Surgery and care during the post-operative period. However, the plaintiff was no longer in the actual custody, charge or care of the NCCS when he decided to proceed with the Whipple Surgery with Prof Ooi. He was in the custody and care of the SGH. The NCCS was only licensed as a medical clinic. It was neither capable, nor did it hold itself out to the plaintiff that it was capable, of providing surgery and inpatient care. The plaintiff knew that he would have to go to the SGH to undergo the surgery by Prof Ooi. The NCCS definitely owed a duty to the plaintiff in relation to pre-operative clinical diagnoses and advice rendered in this connection. However, it is not possible to impute to the NCCS the assumption of a positive duty to protect the plaintiff from harm that might arise from the surgery and post-operative care.

(c) The plaintiff had complete control over whom he chose to perform surgery with. While the NCCS had referred the plaintiff to Prof Ooi, the plaintiff knew that he could choose another surgeon or seek a second opinion from another surgeon or have his operation done at another hospital. In this regard, I note that Dr Tan had offered to put the plaintiff in touch with Dr Tan YM for a second opinion if he so decided.

The duty of care of the NCCS, in this regard, can only extend to recommending a surgeon with the requisite expertise to perform the Whipple Surgery. The NCCS undoubtedly did so in the present case.

(d) In light of the above, the NCCS had not delegated to Prof Ooi some function which is an integral part of its positive duty.

72 The fact that the Whipple Surgery followed from the Tumour Board's Diagnoses and Advice cannot render the NCCS liable for any potential complication arising from the Whipple Surgery or the post-operative management of the plaintiff. The only way the NCCS might be liable for the losses flowing from the Whipple Surgery would be if the diagnoses leading to the said surgery itself were reached negligently. If the diagnoses were not reached negligently, but only the conduct of the Whipple Surgery was negligent, it would not be "fair, just and reasonable" to suggest that the NCCS, a medical clinic, is liable for a surgery which had been performed negligently in another hospital. I must highlight in any case that it is not the plaintiff's pleaded case that the Whipple Surgery itself was performed negligently.

73 I note further that the NCCS led evidence to show that it was a separate legal entity from the SGH. In this regard, it called Dr Soo Kee Chee ("Dr Soo"), a senior consultant and director of the NCCS, to give evidence.[30] The plaintiff alleges without substantiation that the NCCS maintains a surgical facility at the SGH. The plaintiff's argument in seeking to impose a non-delegable duty on the NCCS, a medical clinic, would, if successful, require every medical clinic to insure itself from risks flowing from a potential botched surgery not executed by it but performed at another hospital by a surgeon that it may have

[30] Dr Soo's AEIC, para 4.

recommended. This also goes towards showing that the imposition of a non-delegable duty in such circumstances cannot be "fair, just and reasonable".

74 In sum, I am of the view that the NCCS owed a duty of care to the plaintiff only in relation to the pre-operative diagnoses and advice rendered in this regard. Once the plaintiff decided to proceed with the Whipple Surgery at the SGH with Prof Ooi, the liability that arises from the performance of the Whipple Surgery and the post-operative care thereafter should not be traced back to the NCCS as the NCCS owed no duty of care to the plaintiff in relation to the performance of the Whipple Surgery and the post-operative management of the plaintiff undertaken by Prof Ooi at the SGH, which is an entirely different legal entity from the NCCS. Very importantly, the NCCS has never assumed any responsibility and control over the plaintiff for the purpose of performing the Whipple Surgery and managing his condition post-operatively. Surgery is not one of the functions undertaken by the NCCS, which is a specialist medical clinic only. There is therefore no possible delegation of any surgical functions (which it does not have in any case) to the SGH by the NCCS to begin with, and it has never assumed any institutional responsibility for any surgery performed at another independent hospital, even though the NCCS might have recommended or assisted in the arrangements for the plaintiff to have his surgery performed at the SGH by Prof Ooi.

***Observations on vicarious liability***

75 The plaintiff pleaded that the NCCS would be vicariously liable for the negligence of its "employees, servants and/or agents". In his closing submissions, the plaintiff states that he "will not be making further submissions on vicarious liability itself but will demonstrate that liability for negligence may be imputed on the [NCCS'] employees, servants and/or agents".

76 Although the plaintiff's position on vicarious liability is unclear, I must nevertheless highlight for completeness that, while I am prepared to hold that the NCCS would be vicariously liable in relation to any service performed by Prof Ooi on behalf of the NCCS (which includes his pre-operative advice on the options available to the plaintiff), the NCCS cannot be vicariously liable for the Whipple Surgery and the post-operative care that took place at the SGH. The plaintiff was admitted to the SGH for the Whipple Surgery and inpatient care.

**The diagnoses of the plaintiff**

77 Before analysing if the defendants were negligent in arriving at their diagnoses, *viz*, the clinical diagnosis and the differential diagnosis, I will recapitulate the respective diagnoses that were arrived at by each of the defendants. I will then set out the allegations raised by the plaintiff before analysing if the defendants were negligent in relation to their diagnoses of the plaintiff's condition.

***The clinical and differential diagnoses arrived at and the recommended treatment***

78 The diagnoses of the NCCS can be found in the Tumour Board's Diagnoses and Advice that was communicated to the plaintiff. I reproduce only the portions relevant to the pancreas:

> …
>
> 3. The pancreas lesion is more troublesome. The *impression is that the pancreas lesions are real despite negative MRI and CT findings* and these are of increased importance as compared with the lung lesion, as it is appreciated that *pancreatic neuroendocrine lesions have a higher propensity for spread.*
>
> 4. The current risk of spread or metastasis is not known. The [PB lesion] measures 1.5cm based on the PET SUV outline.

> 5. *In regards to the [PU lesion], it can represent a [NET] or [hyperplasia].* Current literature is yet uncertain on the significance of such uncinate somatostatin uptake.
>
> 6. The consensus is for removal of the [PB lesion]. The [PU lesion] is more uncertain, as the surgical side-effects/morbidity may be higher. You might want to discuss the surgical options with [Prof Ooi].
>
> …
>
> [emphasis added]

79 The Tumour Board's Diagnoses and Advice stated that both "the pancreatic lesions are real despite negative MRI and CT findings". However, the Tumour Board took the view that the PU lesion could either be PNETs or hyperplasia. In other words, there was a differential diagnosis of hyperplasia in relation to the PU lesion. There was no differential diagnosis of hyperplasia specifically indicated in relation to the PB lesion. It can be inferred from the above that the clinical diagnosis for the PB lesion was that of PNETs. The Tumour Board also observed that PNETs have a high propensity for spread/metastasis.

80 I note for completeness that the fact that PNETs have a higher propensity to metastasise as opposed to the NETs in the lung was accepted by both the plaintiff and the defendants during trial. In fact, the plaintiff's expert, Professor Irvin Modlin ("Prof Modlin"), Professor of Surgery at Yale University School of Medicine, even agreed in evidence that PNETs were somewhat like "sleepy… cats" and that they could "behave terribly" suddenly even if they looked benign at first glance.[31]

[31] Transcript dated 7 May 2014, pp 37 – 39.

81 In the Tumour Board's Diagnoses and Advice, it was stated that surgery was indicated for the PB lesion, but discussions in relation to the PU lesion should be undertaken with Prof Ooi. I note that Prof Ooi thereafter advised the plaintiff to remove both the pancreatic lesions (see [35] above).

82 Intraoperatively, Prof Ooi mobilised the pancreatic head and, using palpation, estimated from the induration that PU lesion was 2cm, and the PB lesion was 1cm by 0.5cm. This corresponded with the estimated sizes on the plaintiff's Gallium scan. As noted, the IOUS did not show any distinct lesions. The point that is made here is that palpation was used as a further diagnostic tool by Prof Ooi and it is one that would only be available to the operating surgeon before resection of the pancreatic lesions.

***The plaintiff's allegations***

83 In the pleaded case of the plaintiff and the further and better particulars provided, the plaintiff alleges that the defendants had been negligent by reason of the following:

(a) the plaintiff had been wrongly diagnosed with pancreatic cancer;

(b) various findings such as the CT and MRI scans and blood test results had not been properly considered in arriving at the diagnosis;

(c) a pre-operative EUS-FNA and intraoperative frozen section should have been carried out; and

(d) the Whipple Surgery was not reasonably indicated and should have been aborted after a negative IOUS.

84 Allegation (a) stands on its own and is the subject of a separate analysis. Allegations (b) – (d) however are not to be analysed separately. They relate to the various diagnostic tools that should be considered in arriving at a diagnosis of NETs. I therefore propose to analyse them together as part of the inquiry of whether the defendants were negligent in reaching the diagnoses. I note that the plaintiff in his closing submissions has suggested that the defendants have not taken a position on any diagnosis as they have constantly suggested that the plaintiff was suspected of having NETs.[32] This submission lacks even superficial attractiveness. The clinical diagnosis of NETs can only be *confirmed* upon post-operative histopathology. In developing a clinical diagnosis (and a differential diagnosis, if there is one), the doctor has to consider and scientifically analyse the various test results, symptoms and history of the patient and decide where they probably point to in terms of the likely diagnosis. The question for the court in turn is to analyse whether the physician, in reaching his diagnosis, acted in accordance with a practice accepted as proper amongst a responsible body of medical practitioners skilled in that area. The opinion of the latter would, of course, have to rest on a logical basis.

***The law on medical negligence***

85 Before I deal with each of the above allegations in turn, I propose to set out the *Bolam – Bolitho* test (as accepted in *Khoo James v Gunapathy*) that I have to apply in assessing if the defendants were negligent in relation to these allegations.

86 The court in *Khoo James v Gunapathy* observed (at [54]) as follows in relation to *Bolam*:

[32] The plaintiff's closing submissions, para 521.

> This principle took root in English jurisprudence when McNair J relied on *Hunter v Hanley* ([53] *supra*) as the basis for his now famous direction to the jury in *Bolam v Friern Hospital Management Committee* [1957] 1 WLR 582 at 587; [1957] 2 All ER 118 at 122, where he said:
>
> > [A doctor] is not guilty of negligence if he has *acted in accordance with a practice accepted as proper by a responsible body of medical men skilled in that particular art* … Putting it the other way round, a man is not negligent, if he is acting in accordance with such a practice, merely because there is a body of opinion that takes a contrary view.
>
> [emphasis added]

87 As noted in *Khoo James v Gunapathy* (at [59]) the above test in *Bolam* was supplemented in *Bolitho*:

> The Bolam test was later supplemented by the House of Lords decision in *Bolitho v City and Hackney Health Authority* [1998] AC 232; [1997] 4 All ER 771. There, Lord Browne-Wilkinson, with whom his brethren agreed, made it clear that the court was not bound to find for a defendant doctor simply because a body of experts testified in his favour. To qualify as a responsible body of opinion, *such testimony must have a logical basis. This meant that the experts had to have directed their minds to the comparative risks and benefits and have reached a "defensible conclusion" on the matter* …
>
> [emphasis added]

88 Put together, in applying the *Bolam – Bolitho* test, the court has to analyse if the medical practitioner had "*acted in accordance with a practice accepted as proper by a responsible body of medical men skilled in that particular art*" and the "*testimony* [*of the responsible body of medical men*] *must have a logical basis*."

89 Naturally, in order to show whether the defendants acted in accordance with a *practice accepted as proper*, the plaintiff and defendants adduced expert evidence before the court by medical practitioners in specific areas that touch

on the present case. I set out in Table 1 below the respective experts and the area of their expertise:

**Table 1: Experts who gave evidence**

| **Area of speciality** | **The plaintiff's expert** | **The NCCS' expert** | **Prof Ooi's expert(s)** |
|---|---|---|---|
| HPB Surgery | Prof Modlin | - | Professor Markus Büchler ("Prof Büchler") |
| | | | Professor Krishnakumar Madhavan ("Prof Madhavan") |
| Nuclear medicine | Dr Lisa Bodei ("Dr Bodei") | Professor Irene Virgolini ("Prof Virgolini") | - |
| Histopathology | Professor David | - | Dr Frank Bergmann |

| | | | |
|---|---|---|---|
| | Klimstra ("Prof Klimstra") | | ("Dr Bergmann") |
| Cythopathology | - | Professor Martha Pitman ("Prof Pitman") | - |
| Oncology | - | Dr Foo Kian Fong ("Dr Foo") | |

***The plaintiff was not informed or advised that he had pancreatic cancer***

90 PNETs arise from the endocrine cells of the pancreas, also known as the islets of Langerhands. As noted by a paper referred to by Prof Büchler, *viz*, Jianliang Zhang *et al*, "Current Understanding of the Molecular Biology of Pancreatic Neuroendocrine Tumors" (2013) 105 Journal of National Cancer Institute 1005 ("the Zhang paper"),[33] the full spectrum of disease ranges from early-stage benign hyperplasia or adenoma and localised well-differentiated NETs to more advanced metastatic or poorly differentiated neuroendocrine carcinomas ("NECs"). I must caution that there is controversy as to whether hyperplasia is a disease. However, as my decision does not turn on an affirmative finding on that, I only make some observations (at [168] – [170]) below. I highlight the Zhang paper only to show that PNETs relate to endocrine

[33] Exhibit 1D24.

cells, which present themselves in their most malignant form as NECs. I note that the plaintiff's pleaded case suggests that he was negligently informed and advised by the defendants that "*he was suffering from pancreatic cancer and needed to undergo an urgent Whipple surgery*".[34] On the first day of trial, his counsel stated that "*the plaintiff was actually diagnosed to suffer from a cancer which is called the neuroendocrine cancer of the pancreas*"[35]. In closing submissions, counsel for Prof Ooi argued that the term "pancreatic cancer" refers to pancreatic exocrine adenocarcinomas, which relate strictly to the exocrine or acinar cells and not the neuroendocrine cells of the pancreas. Therefore, the plaintiff should not be able to pursue this allegation as the case he ran at trial was different from his pleaded case. Although I am prepared to accept that a PNET is not the same as pancreatic cancer, I do not think that this is a sufficient basis to find that the plaintiff is not able to pursue the allegation that he had been misinformed by the defendants that he had pancreatic cancer. A better approach, in my view, would be to go straight into the evidence to analyse whether the plaintiff was at any time in fact informed or advised by the defendants that he was suffering from pancreatic cancer.

91 I note at the outset that the plaintiff's case that he had been *informed or advised* by the defendants that he was suffering from "pancreatic cancer" was not borne out by the opinion of the Tumour Board, the medical notes recorded by Prof Ooi and the correspondence between the plaintiff and the defendants, all of which referred to NETs, PNETs and hyperplasia (and not to any *pancreatic cancers*, NECs or pancreatic exocrine adenocarcinomas or to "*a cancer which is called the neuroendocrine cancer of the pancreas*"). The

[34] The plaintiff's bundle of pleadings, p 9.

[35] Transcript dated 23 April 2014, p 5.

plaintiff has identified an email subject header and administrative forms where the words "Ca" (*ie*, cancer) and carcinoid have been used. However, as will be seen at [95] below, these documents do not establish the plaintiff's case that he was informed or advised by the defendants that he was suffering from pancreatic cancer. In fact, I note that the Tumour Board's Diagnoses and Advice refers exclusively to PNETs and hyperplasia. I reproduce it below for convenience:

> 3. The pancreas lesion is more troublesome. The impression is that the pancreas lesions are real despite negative MRI and CT findings and these are of increased importance as compared with the lung lesion, as it is appreciated that pancreatic neuroendocrine lesions have a higher propensity for spread.
>
> 4. The current risk of spread or metastasis is not known. The [PB lesion] measures 1.5cm based on the PET SUV outline.
>
> 5. In regards to the [PU lesion], *it can represent a [NET] or [hyperplasia]*. Current literature is yet uncertain on the significance of such uncinate somatostatin uptake.

92 Nowhere in the Tumour Board's Diagnoses and Advice or the defendants' written communications do they inform the plaintiff that he had been diagnosed or definitely diagnosed with pancreatic cancer or NECs or for that matter "*a cancer which is called the neuroendocrine cancer of the pancreas*". The defendants only highlighted to the plaintiff the likelihood of PNETs and hyperplasia. In fact, the evidence reveals that the plaintiff was aware that he might suffer from PNETs or hyperplasia.

93 As noted at [37] above, on 8 August 2010, the plaintiff emailed Dr Tan for further clarification.[36] He asked why the Tumour Board had reached the view it had. The plaintiff himself never referred to any "cancer", "pancreatic cancer" or "neuroendocrine cancer" when he explicitly asked questions in his email on

[36] 6 AB 193.

why the Tumour Board was more certain of its diagnosis of PNET for the PB lesion but unsure whether the PU lesion was a PNET or hyperplasia. This demonstrates that the plaintiff was not labouring under any misapprehension that the two lesions in his pancreas had been definitely diagnosed as pancreatic cancers. If he had believed that his diagnosis had been so definitive, there would have been no reason to make further enquiry or ask further questions. I reproduce the plaintiff's questions as follows:

> I forgot to ask these questions earlier: Why would [the Tumour Board] feel that the body lesion is more definitely a neuroendocrine tumour [*ie*, a NET], whereas it is not sure that the head tumour is a similar lesion or a hyperplasia.
>
> …

94 Dr Tan's reply in this regard is not germane to the present analysis. It is sufficient to note for present purposes that the plaintiff himself was made fully aware that there was a chance of him suffering from either PNETs or hyperplasia but at no time was pancreatic cancer indicated even as a possibility in the diagnosis or as a differential diagnosis. Additionally (as noted at [27] above), in the header of his own email to Prof Ooi, the plaintiff referred to "[NETs] of the pancreas" and not to "pancreatic cancer" or to "*neuroendocrine cancer of the pancreas*". This shows that, in his mind, he could not have been thinking or believing that he was suffering from pancreatic cancer of some form.

95 I note that counsel for the plaintiff pointed to an email from Dr Koo to Dr Foo YC and the plaintiff with the email subject header entitled "Neuroendocrine ca".[37] It was unclear where counsel for the plaintiff was planning to go with this reference, but I nevertheless highlight for completeness that that email was part of an email thread *commenced by Dr Foo YC* who used

[37] Transcript dated 25 August 2015, p 62 and 6 AB 183.

that header because "[the plaintiff] was diagnosed to have neuroendocrine carcinoma"[38] of the lung while he was in Malaysia. Dr Koo thus explained that he was merely replying to that email to update Dr Foo YC as a matter of convenience.[39] As noted, the plaintiff at all times knew that he was dealing with PNETs (see [94] above). The plaintiff also refers to certain administrative forms that used the words "CA PANCREA"[40] and "Histological type: neuroendocrine, carcinoid"[41] to buttress his case that he was wrongly diagnosed of pancreatic cancer. Prof Ooi and Dr Koo clarified in their testimonies that these forms were filled in by administrative staff. I accept their evidence. In any case, I note that these administrative forms would have had *no bearing on the plaintiff's view* on what condition he suffered from; these forms were neither used to inform the plaintiff of his condition nor advise him on the same.

96 When asked in the course of cross-examination to clarify if he was aware that PNETs were different from pancreatic cancer, the plaintiff's response was as follows:[42]

> A: I knew that tumour can be cancerous and non-cancerous. But in reference to my own tumour, I was at that point of time believing that my tumour was cancerous after consultation.
>
> Court: So you have changed a bit in your evidence. Now you are telling me throughout all these emails, you were aware the tumour is not cancer, that the tumour can be cancerous and also can be non-cancerous.
>
> A: Yes, that's correct.

[38] 6 AB 181 – 182.

[39] Transcript dated 25 August 2015, p 62 and 6 AB 183.

[40] DCB 137.

[41] 1 AB 29.

[42] Note of Evidence dated 29 April 2014, pp 53 – 54.

97 The plaintiff gave evidence that he got the impression that the tumours he had were cancerous not from the defendants but from his research on the internet and his consultation with doctors in Malaysia. I reproduce his evidence in this regard:[43]

> Q: I asked you on what basis you formed the view that neuroendocrine tumour is a cancer. You gave me a list, you talked about your Malaysian doctors, and I asked whether anything else, and you said no, so my conclusion must be that none of the doctors in Singapore, Professor Ooi, Dr Tan, Dr Koo, Dr Lim, told you that a neuroendocrine tumour is a cancer?
>
> A: *If you ask me whether they say it in my face that neuroendocrine tumour is a cancer,* ***no,*** but if you ask me whether I formed the impression from what they say, such as, 'If you don't cut it out now, it will spread, mestastasis [*sic*], spreading', what other conclusion would you expect me to draw?
>
> [emphasis added in italics and bold italics]

98 The plaintiff accepts that he knew the difference between PNETs and pancreatic cancer. He also accepts that he was not told explicitly by the defendants that he suffered from pancreatic cancer.[44] In fact, he accepts that he was told by the defendants in the written communications that he might be suffering from PNETs. In the circumstances, I find on a balance of probabilities that the plaintiff was never informed or advised by the defendants that he suffered from pancreatic cancer or neuroendocrine cancer. This is nothing but a bald allegation levied against the defendants by the plaintiff in a futile attempt to fortify his claim.

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[43] Transcript dated 23 April 2014, pp 149 – 150.

[44] Transcript dated 23 April 2014, pp 126, 149 – 150.

***The defendants were not negligent in arriving at the clinical and differential diagnoses***

99 The analysis here is whether the NCCS, as represented by the Tumour Board, was negligent in reaching its clinical diagnosis of PNETs in relation to the pancreatic lesions and its differential diagnosis of hyperplasia in relation to the PU lesion. The involvement of Prof Ooi in developing the clinical diagnosis and differential diagnosis is not significant as his role was to analyse the surgical resectability of the pancreatic lesions. Prof Ooi's role becomes more salient in analysing the results of his palpation and the IOUS of the pancreas itself during the Whipple Surgery.

100 By way of summary, the following were considered by the Tumour Board in reaching the diagnoses:

(a) the results of the plaintiff's Gallium PET/CT scan;

(b) the results of the plaintiff's MRI scan;

(c) the symptoms that were highlighted by the plaintiff; and

(d) the plaintiff's medical history.

101 The following were *additionally* considered by Prof Ooi during the Whipple Surgery:

(a) the results of the IOUS; and

(b) the results from the palpation of the pancreas.

*The plaintiff's Gallium scan: the findings*

102 The plaintiff's Gallium scan of course played a central role in the defendants reaching the diagnoses. Therefore, I first propose to analyse the expert evidence in relation to the utility of the Gallium scan as a diagnostic tool for PNETs. I will then consider the results of the plaintiff's Gallium scan and its diagnostic value.

103 The Gallium scan is a full body scan that is used in the diagnosis of NETs in countries where its use is approved. The Gallium scan operates by detecting and analysing the distribution of the somatostatin analog (DOTATATE) throughout the body after the introduction of a radioisotope, *viz*, Gallium68, tagged with DOTATATE, into the body. The radioisotope binds to the somatostatin receptors, which are expressed in cells rich with somatostatin receptors. These cells "light up" *ie*, appear as bright spots ("hotspots"), on the Gallium scan. The Gallium scan is the diagnostic tool of choice specifically for the detection of NETs as the neuroendocrine cells in the NETs are rich in expressing somatostatin receptors. Therefore, hotspots in the Gallium scan indicate an abnormal agglomeration of neuroendocrine cells. In such a situation one might expect a NET to be found where there is a hotspot. The relevant field of medical inquiry in relation to the interpretation of Gallium scans is nuclear medicine.

104 The uptake of the radioisotope tracer by the somatostatin cells (*ie*, tracer uptake) is measured using a semi-quantitative measure known as standardised uptake value (*ie*, SUVmax). Naturally, as there are neuroendocrine cells present in various parts of the body, there would be physiological uptake (*ie*, expected background activity) and non-physiological (*ie*, pathological) uptake of the tracer in the body. The higher the tracer uptake, the more concentrated the "light

up" or hotspot would be in the Gallium scan. Such a focal hotspot, when it is not normally expected to be present in that part of the body, will therefore suggest an abnormal formation, aggregation and conglomeration of a large number of neuroendocrine cells.

105 As noted, there were two areas of focal uptake in the plaintiff's Gallium scan. I reproduce the relevant observations:[45]

> …
>
> There are focal areas of increased tracer uptake seen in the pancreatic uncinate process (SUVmax 23.0, image 177) and in the pancreatic body (SUVmax 13.2, image 165). No definite corresponding mass is evident.

106 In the pancreas, a focal tracer uptake will be indicative of (1) the presence and concentration of neuroendocrine cells; or (2) inflammatory cells present in areas of inflammation within the pancreas, *ie*, pancreatitis. The second condition is not of relevance in the present dispute as the parties accept that there was no evidence of pancreatitis in the plaintiff.

107 The primary advantage of the Gallium scan over conventional imaging scans such as the CT scan and the MRI scan is that it identifies specifically that the lesion, where there is an increased tracer uptake, relates to an abnormal formation, aggregation or conglomeration of neuroendocrine cells. This advantage is not present in conventional imaging which cannot identify the cell type of the lesion. This is because the CT scan and the MRI scan only use cross-sectional imaging to identify abnormalities, meaning that they look out for differences in tissue density. Therefore, a CT or MRI scan will not be useful in

[45] DCB 48 – 49.

specifically identifying NETs even though the imaging may reveal the presence of mass.

108 The plaintiff's nuclear medicine expert, Dr Bodei, is a nuclear medicine physician at the European Institute of Oncology in Milan. During trial, Dr Bodei essentially agreed that the Gallium scan is the "gold standard" in assessing PNETs. She accepted that it is the best diagnostic test that is available to detect PNETs and is superior to the CT scan and the MRI scan because of its sensitivity and specificity.[46] Prof Virgolini, a nuclear medicine physician at the Medical University of Innsbruck, was called by the NCCS to give expert evidence on issues pertaining to nuclear medicine. Prof Virgolini also gave evidence that the Gallium scan is the more sensitive and specific test for the detection of NETs.[47] In this regard, I reproduce the comparative results in relation to the sensitivity, specificity and accuracy set out in Michael Gabriel *et al*, "$^{68}$GA-DOTA-Tyr$^{3}$-Octreotide PET in Neuroendocrine Tumors: Comparison with Somatostatin Receptor Scintigraphy and CT" (2007) 48(4) The Journal of Nuclear Medicine 508 ("the Gabriel paper")[48] in the Table 2 below:

**Table 2: A comparison of three imaging modalities**

| **Parameter** | **PET (*ie*, Positron Emission Tomography) (Gallium scan) (%)** | **SPECT (*ie*, Single Photon Emission Computed Tomography) (%)** | **CT (%)** |
|---|---|---|---|

[46] Transcript dated 9 May 2014, p 144.

[47] Transcript dated 8 September 2015, pp 53 –54.

[48] Exhibit 2D13.

| | | | |
|---|---|---|---|
| **Sensitivity** | 97 | 52 | 61 |
| **Specificity** | 92 | 92 | 71 |
| **Accuracy** | 96 | 58 | 63 |

109 The Gabriel paper was referred to by Dr Bodei and Prof Virgolini. As regards the MRI scan, it was noted in Aaron I. Vinik *et al*, "NANETS Consensus Guidelines for the Diagnosis of Neuroendocrine Tumours" (2010) 39(6) Pancreas Journal 713 at 727 – 728[49] ("the Vinik paper"), which was referred to by Dr Bodei, that the results of conventional imaging including the MRI scan are dependent to a large degree on the tumour size. In this regard, conventional imaging studies detect greater than 70% of PNETs that are more than 3cm but less than 50% of PNETs that are less than 1cm, therefore frequently missing smaller primary PNETs. Therefore, there remains the chance and the real risk that the results from conventional imaging such as CT or MRI scans might produce false negative results, *ie*, suggesting that there is no mass or tumour when there actually is one.

110 Having said that, the values in the Table 2 above cannot be taken to apply categorically across the anatomy as they are not adjusted for false positive results that might occur with greater likelihood in different parts of the anatomy. Dr Bodei's evidence was that it is not possible to make much of the results of the Gallium scan without a corresponding CT or MRI scan as the pancreas is an

[49] Dr Bodei's Affidavit at 278 – 279.

area of false positivity.[50] However, Prof Virgolini's evidence was more nuanced. She agreed with Dr Tan's view (see [38] above) that in relation to the pancreatic body or tail lesions, the issue was more with false negatives.[51] However, she agreed with Dr Tan's view that there was greater uncertainty in relation to the interpretation of a hotspot in the Gallium scan in the uncinate process of the pancreas ("the uncinate process") because there was a chance of a false positive, *ie*, the lesion does not represent a tumour but instead hyperplasia.[52]

111 Again, I do not think that the scientific literature as it stands is able to provide accurately a figure as to the likelihood of false positives in the uncinate process. However, I note that Prof Virgolini and Dr Bodei both alluded to the analysis in Paolo Castellucci *et al*, "Incidence of Increased $^{68}$Ga-DOTANOC Uptake in the Pancreatic Head in a Large Series of Extrapancreatic NET Patients Studied with Sequential PET/CT" (2011) 52(6) The Journal of Nuclear Medicine 886 ("the Castellucci paper"). Prof Virgolini explained the analysis in this paper. She highlighted that the 100 patients analysed in this paper did not have pancreatic tumours. However, 23% of those patients had diffused uptake in the pancreatic head and uncinate process while 8% of those patients had focal uptake in the same.[53] Therefore, what the Castellucci paper shows is that even where there is focal tracer uptake in the uncinate process, there appears to be an 8% chance that such tracer uptake is physiological and does not represent a NET.

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[50] Transcript dated 9 May 2014, pp 52 –53.

[51] Transcript dated 8 September 2015, p 51.

[52] Transcript dated 8 September 2015, pp 52 –53.

[53] Transcript dated 9 September 2015, pp 9 –11.

112 After having analysed the evidence given both by Prof Virgolini and Dr Bodei, it appears that the Gallium scan still remains the "gold standard" in diagnosing whether an individual suffers from PNETs, be it in the pancreatic head and uncinate process or in the pancreatic body or tail. In fact, Prof Virgolini was also able to provide the opinion that a focal uptake would be more in "the malignant direction" while a diffused uptake would suggest a "more benign" histology.[54] Dr Bodei's evidence was no different: she said in response to my clarification that one would be able to detect a PNET in the uncinate process when "an area of focal uptake" is observed.[55]

113 There was also discussion on the SUVmax values in the plaintiff's Gallium scan. Dr Bodei suggested that "very high values tend to be indicative of a malignancy".[56] However, Dr Bodei pointed out that the literature was unclear on what was a very high value because the literature suggested a range of "cut-off" points.

114 In this regard, I was referred first to V. Prasad & R. P. Baum, "Biodistribution of the Ga-68 labeled somatostatin analogue DOTA-NOC in patients with neuroendocrine tumors: characterization of uptake in normal organs and tumor lesions" (2010) 54(1) The Quarterly Journal of Nuclear Medicine and Molecular Imaging 61 ("the Prasad & Baum paper"). The authors there suggested that "physiologic uptake in the [uncinate process] of pancreas can be differentiated from the uptake in pancreatic tumors with high diagnostic accuracy by keeping a cut-off SUVmax of 8.6". This cut-off value can be used

[54] Transcript dated 8 September 2015, p 16.

[55] Transcript dated 9 May 2014, p 19.

[56] Transcript dated 9 May 2014, p 55.

to differentiate between a physiological uptake and PNETs with sensitivity and specificity of 92% and 94% respectively. In a more recent paper by A. Kroiss *et al*, "$^{68}$Ga-DOTA-TOC uptake in neuroendocrine tumour and healthy tissue: differentiation of physiological uptake and pathological processes in PET/CT" (2013) 40 European Journal of Nuclear Medicine and Molecular Imaging 514 ("the Kroiss paper"), it was suggested that the cut-off SUVmax of 17.1 could be used to differentiate between a physiological uptake and PNETs with sensitivity and specificity of 90% and 93.6% respectively.

115 In the present case, the SUVmax value in relation to the plaintiff's Gallium scan was 23.0 for the PU lesion and 13.2 for the PB lesion. The state of learning at the time of the Tumour Board Advice is contained in the Prasad & Baum paper. Based on that paper, it is more than clear from the SUVmax value in the plaintiff's Gallium scan that the tracer uptakes in the PU lesion and, *a fortiori*, the PB lesion, which generally does not lend itself to false positives, are not likely to be physiological.

116 Prof Virgolini accepted that the literature (referring to the Prasad & Baum paper and the Kroiss paper) indicates, *inter alia*, that the SUVmax value could indicate a "cut-off" point between benign and malignant lesions in the uncinate process. However, Prof Virgolini was of the view that the so-called "cut-off" should not be determinative in relation to the uncinate process given that there is a chance of false positives, but should only give a direction on the nature of the lesion "which is [nevertheless] significant".[57] The SUVmax value of 23.0 in relation to the PU lesion in the plaintiff's Gallium scan does suggest

[57] Transcript dated 9 September 2015, pp 13 – 15.

a direction of malignancy whether one uses the "cut-off" proposed in the Prasad & Baum paper or the Kroiss paper.

117 Let me summarise the points that I have sieved from the evidence thus far:

(a) the plaintiff's Gallium scan shows two regions of focal uptake and both experts on nuclear medicine agree that focal uptakes are a sign of malignancy;

(b) the Gallium scan has a chance of giving a false positive result in relation to the PU lesion;

(c) the Gallium scan has a chance of giving a false negative result in relation to the PB lesion;

(d) the SUVmax value of 23.0 in relation to the PU lesion of the pancreas is in the direction of malignancy; and

(e) though the plaintiff's CT and MRI scans do not show a corresponding mass, conventional imaging modalities, such as the CT and MRI scans, frequently miss smaller PNETs.

*Should the plaintiff's MRI scan have displaced the suspicion entertained on the back of the plaintiff's Gallium scan?*

118 The central argument of the plaintiff's experts, Prof Modlin and Dr Bodei, is that while the Gallium scan was the "gold standard", the suspicion of PNETs must be displaced in light of the negative findings on the plaintiff's MRI

scan. This position is entirely *curious* given that both Prof Modlin[58] and Dr Bodei[59] admitted readily that the suspicion of PNETs would still be raised if the Gallium scan shows focal uptake but the conventional imaging including the MRI scan does not show a corresponding mass. In fact, Dr Bodei even referred to the position in the Vinik paper noted at [109] above that the MRI scan frequently missed smaller PNETs.[60]

119 Prof Büchler, Consultant General Surgeon at Heidelberg University Hospital, was Prof Ooi's expert on HPB surgery. Prof Büchler further observed that the suspicion of PNETs was rendered stronger by the fact that the plaintiff's Gallium scan showed two areas of focal uptake in the pancreas. He took the view that this was "absolutely unusual."[61] I will discuss the relevance of this view below.

*Should an EUS-FNA be performed?*

120 The question to be asked is whether the additional test of EUS-FNA would have helped the Tumour Board and Prof Ooi in reaching a diagnosis of the plaintiff's condition. The plaintiff called Prof Klimstra, Professor of Pathology at the Sloan-Kettering Cancer Centre, to give expert evidence on the utility of an EUS-FNA. The NCCS called Prof Pitman, Pathologist at the Cytopathology Laboratory at Massachusetts General Hospital, while Prof Ooi called Dr Bergmann, Senior Pathologist at the Institute of Pathology, University of Heidelberg. The EUS-FNA would only be useful in the present case if it can

[58] Transcript dated 7 May 2014, pp 81 – 82.

[59] Transcript dated 9 May 2014, pp 146 – 147.

[60] Transcript dated 9 May 2014, p 93.

[61] Transcript dated 3 September 2015, p 81.

differentiate between PNETs and hyperplasia because the plaintiff's central complaint in relation to the diagnoses seems to be that the defendants did not take sufficient steps to ensure that PNETs were ruled out and a correct diagnosis of hyperplasia was made.

121 By way of overview, EUS-FNA is a form of biopsy involving the aspiration for laboratory analysis of one or more cells from a lesion using a fine needle guided by EUS. It is therefore a cytologic analysis as it examines a few cells, as opposed to a histologic analysis that analyses the structure of cells when linked together as part of a lesion. To be specific, the medical discipline that would be most relevant to the issue of EUS-FNA would be cytopathology. Prof Klimstra is a surgical pathologist whose work does not regularly involve the interpretation of cytopathology.[62] As conceded by Prof Klimstra, Prof Pitman, who is a cytopathologist, has "significantly more experience interpreting pancreatic cytopathology" than he has.[63]

122 Prof Klimstra's opinion was follows:[64]

> So my opinion is putting a needle in that PET positive hot spot would have produced so many endocrine cells that whether they were diagnostic of a endocrine tumour, that's not the point, it would have raised the spectre at least that there was a endocrine tumour. Whether you did it by FNA or you did it by core biopsy, an intraoperative biopsy, that it would have not looked like normal acinar tissue, and you could not have confidently said that there was no tumour present.

[62] Transcript dated 30 September 2014, p 32.

[63] Transcript dated 30 September 2014, p 33.

[64] Transcript dated 28 October 2014, p 11.

123 He also accepted that surrounding morphological architecture of cells cannot be seen on an FNA.[65] However, his central argument was that the proportion of neuroendocrine cells in the FNA would have enabled the diagnosis of NETs. I reproduce his evidence in cross-examination:[66]

> Q. Why do you say you need 75 per cent neuroendocrine cells before you would be concerned when the normal pancreas has only 1 to 2 per cent neuroendocrine cells?
>
> A. Well, what I said is that in order to establish an unequivocal diagnosis of the tumour, it would be preferable to have the substantial majority of cells on the fine needle aspirate to be neuroendocrine cells. One can always obtain a small component of contaminating normal tissue when approaching a mass with a biopsy. So it doesn't need to be 100 per cent, but it should be certainly more than 75 per cent.
>
> But I also acknowledge that if you had a population of neuroendocrine cells that was somewhere less than 75 per cent and more than, perhaps, 20 or 25 per cent, that may be sufficient to raise concerns, as we were discussing earlier. There is a gray zone in cytology.
>
> Q. There is indeed a gray zone and I think we are hearing a lot of this grayness in the course of these proceedings. *But these numbers that you mentioned, earlier you mentioned 40 per cent before you would say there is some concern or some suspicion. Now the figure is 20 per cent.* Would I be correct to say Dr Klimstra, that there's no actually no published data or figures that provide those benchmarks, do you agree?
>
> A. Yes, and I think I made it very clear to his Honour when he posed the question, that *I was putting some hypothetical numbers in order to try to give some context* to the statement about the proportion of cells that might cause concern.
>
> [emphasis added]

[65] Transcript dated 30 September 2014, p 68.

[66] Transcript dated 1 October 2014, pp 50 – 51.

124 Prof Pitman gave evidence that the EUS-FNA was operator dependent and false positives and false negatives may occur due to technical difficulties in obtaining the specimen. She was also of the view that the EUS-FNA would not be able to distinguish between PNETs and hyperplasia as the "morphological appearance of an endocrine cell from pancreatic hyperplasia and [PNET] is indistinguishable".[67] For the same reason, she viewed that an intraoperative core biopsy would have also "produced a very challenging biopsy specimen leading to either an indeterminate or false positive diagnosis for [PNET]".[68]

125 Prof Pitman also crucially noted that because cytology cannot distinguish between endocrine cells of hyperplasia and neoplasia, a FNA yielding endocrine cells would have only confirmed the clinical diagnosis of PNETs.[69] This is because so many neuroendocrine cells would be aspirated when a lesion with hyperplasia is hit by the needle that it would raise the suspicion of PNETs as whenever there is an abnormal amount of neuroendocrine cells, PNETs cannot be ruled out.[70] Prof Pitman opined out that a 10 – 20% proportion of neuroendocrine cells in a FNA (as would have likely been the case in the plaintiff's FNA in her evidence) would raise the suspicion of NETs. In this regard, Prof Pitman pointed out that Prof Klimstra's suggestion that anything below 40% neuroendocrine cells in a FNA would be interpreted as negative for NETs is not supported by any literature.[71] I observe that this might not even be supported by Prof Klimstra's experience, whose work, unlike

[67] Prof Pittman's AEIC, p 59 (para 14(a)).

[68] Prof Pittman's AEIC, p 60 (para 14(c)).

[69] Prof Pittman's AEIC, p 61.

[70] Transcript dated 28 October 2014, pp 10 – 11, 33,

[71] Transcript dated 28 October 2014, pp 39 – 44.

Prof Pitman, does not involve cytopathology. Additionally, Prof Klimstra himself admitted that his analysis was based on hypothetical numbers. Lastly, Prof Pitman pointed out that a definitive diagnosis of hyperplasia, microadenoma and NETs could only be made on histopathology because of the significance of morphology in such a diagnosis.[72]

126 Dr Bergmann's evidence was as follows:[73]

> 20 While in experienced hands cytology may be well suited to distinguish PNET from other pancreatic neoplasms … cytology is not able to adequately differentiate between PNET and islet cell hyperplasia: the cytologic findings of islet cell hyperplasia were reported to be essentially indistinguishable from those of PNETs … There are no remarkable differences between individual cells aspirated from nodules of neoplastic and hyperplastic neuroendocrine cells of the pancreas, and the only minor difference is that the clusters of neoplastic cells are larger than those of hyperplastic cells.

127 Dr Bergmann also argued that the proportion of cellularity cannot be used (contrary to Prof Klimstra's view) to differentiate between PNETs and hyperplasia as the proportion of cellularity depends on whether any other contaminating cells have been picked up.[74]

128 I must also point out another difficulty: the EUS-FNA in this case would have been tantamount to a "blind FNA" as the EUS would not have revealed a mass to begin with, hence there was nothing much to guide the FNA accurately to the location of the hotspot in the pancreas for the biopsy.[75] Sampling error thus increases. After considering the experts' evidence, I am inclined to accept

[72] Transcript dated 29 October 2014, pp 83 – 84.

[73] Dr Bergmann's AEIC, p 36 (para 20).

[74] Transcript dated 2 October 2014, pp 22 – 24.

[75] Transcript dated 1 October 2014, pp 103 – 104.

Prof Pitman and Dr Bergmann's evidence over Prof Klimstra's. I note in this regard that there is no supporting literature to show that an EUS-FNA, even on the assumption that the fine needle could be successfully guided to hit the targeted hotspot for the biopsy, can differentiate between hyperplasia and PNETs. I am also unable to accept Prof Klimstra's hypothetical "cut-offs" as a guide in determining whether a diagnosis of PNETs as opposed to hyperplasia can be made on the back of an EUS-FNA.

129 Prof Modlin also strongly advocated that an EUS-FNA should have been performed in the present case as it had a 95% negative predictive value. However, it was later clarified by Prof Büchler that this figure related to pancreatic cancers and not PNETs.[76] It was also pointed out to Prof Klimstra that there was literature that suggested that the efficacy of EUS-FNA in relation to PNETs fell below 50% to which Prof Klimstra agreed.[77] All this is however beside the point as this figure of 50% relates to situations where an EUS-FNA evinced false negative results for PNETs and do not relate to differentiating between PNETs and hyperplasia (see generally M Voss *et al*, "Value of endoscopic ultrasound guided fine needle aspiration biopsy in the diagnosis of solid pancreatic masses" (2000) 46 Gut 244).

130 On the other hand, Prof Büchler confirmed that there was no need for the Tumour Board to have recommended that an EUS-FNA be carried out before it recommended surgery as an EUS-FNA did not enable better decision-making in relation to pancreatic surgery.[78] Prof Madhavan, Consultant Surgeon

[76] Transcript dated 2 September 2015, p 40.

[77] Transcript dated 1 October 2014, p 55.

[78] Transcript dated 3 September 2015, pp 109 – 110.

at the National University Hospital, who was also Prof Ooi's expert on surgery, confirmed that not proceeding with the EUS-FNA before the Tumour Board recommended surgery was supported because (1) the images would not have been seen on EUS as they were not seen in the IOUS that uses the same imaging modality; and (2) there was the possibility of sampling error in EUS-FNA.[79]

131 Prof Modlin's general "kitchen sink" approach is that many different tests should be performed before reaching a diagnosis of PNETs. In his view, while each test had its limitations, adding them together gave "a cumulative quotient which increase[d] [the] positive predictive value".[80]

132 When asked for his view on Prof Modlin's approach, Prof Büchler gave the following response.[81]

> … I disagree with this statement. We are, in clinical practice nowadays, not on our way to do as many as possible tests. This is not what we do, rather than we do some tests, and we supplement these tests once in a while with another test, but we certainly don't do as many as possible tests to get more evidence. This is certainly not our way of diagnosing and of decision-making in pancreatic tumours.
>
> We take the best test that is the Dotatoc scintigraphy in this situation. So we do the best test and we might supplement this best test with one or two other tests, but we certainly don't go for six, seven or eight or nine tests under the conditions of the more, the better, because this is not the case. The more is not the better, regarding testing in medicine.
>
> So why is that? Why is that? To give an explanation, we have learned, again painfully, that the more tests you do, the more false positive diagnosis you generate. So each new test has a chance for a new false positive diagnosis. This, we know very well.

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[79] Prof Madhavan's AEIC, p 46 (para 10).

[80] Transcript dated 7 May 2014, p 86.

[81] Transcript dated 2 September 2015, pp 33 – 34.

> And then there is also the cost issue, the more tests you do, the more does it cost, and the more tests you do, the more time you need in such patients, and then the time is extended until the patient will get the definitive treatment.

133 It seems to me that an EUS-FNA in the present case would have not assisted in the central issue of differentiating between hyperplasia and PNETs and would have had no positive diagnostic value. I also accept Prof Büchler's evidence, as it is entirely logical. The better approach is to use the best and most accurate test available and not conduct as many tests as possible because as the number of tests (which have lower efficacy or accuracy in detection) increases, the greater will be the chances of generating false positive diagnoses and false negative diagnoses. This evidence is also supported by the view of Prof Madhavan who also took the view that surgery may be recommended without an EUS-FNA.

*The palpation and negative IOUS*

134 The last allegation that I will analyse before I discuss if the defendants were negligent in relation to their diagnoses and treatment plan is the negative IOUS and findings from palpation. The plaintiff's argument is that Prof Ooi was negligent on the basis that he should have aborted surgery when he found that the IOUS did not reveal an anatomical structure of a tumour in the pancreatic lesions.

135 I note that Prof Ooi had stated that he continued with the Whipple Surgery notwithstanding the negative IOUS results because there were two distinct areas of induration when he palpated the plaintiff's pancreas during surgery after he had mobilised it. These areas of induration, according to Prof Ooi, corresponded to the areas of increased tracer uptake in the plaintiff's Gallium scan. Therefore, by the time Prof Ooi operated on the plaintiff and just

prior to the actual resection of the two lesions in the pancreas, there was, apart from the results of the plaintiff's Gallium scan, further confirmation from the palpation that the plaintiff's pancreas was not normal.

136 I note that the plaintiff alleged a further material fact in his AEIC that was not pleaded: he had requested for an intraoperative biopsy of the frozen section to be performed. I would address this at a later point in the judgment.

137 I now turn to the evidence on proceeding with the Whipple Surgery based on the additional positive finding of indurations during the palpation of the pancreas and in the absence of positive findings from the IOUS. Prof Pitman provided evidence that there "[were] plenty of examples of [IOUSs] being negative when there was indeed a tumour present".[82] Prof Pitman reasoned that because the Gallium scan was known to be the most sensitive test for the detection of NETs, the strong positive findings on the plaintiff's Gallium scan would put to doubt the other tests that do not show an anatomical structure indicating that there was a tumour. I am inclined to accept this very logical reasoning of Prof Pitman.

138 On the issue of palpation, I produce Prof Ooi's evidence on what he felt when he palpated the pancreas:[83]

> …
>
> So in palpation, we will feel an area that is different from the surrounding pancreas. Pancreas normally feels a bit softish, it's not mushy, but it's a bit softish. If you feel an area of induration, induration means hardness, so you actually feel something that is not quite right in that area.

[82] Transcript dated 28 October 2014, pp 72 – 73.

[83] Transcript dated 26 August 2015, pp 221 – 223.

> Now, obviously we have no way of seeing inside, we can only feel. But sometimes a surgeon's hands, especially an experienced surgeon's hands, can actually feel more than you can see.
>
> In this case I felt something in the head of the pancreas where the uncinate process was. In correlation with the Gallium scans that were available in theatre, in theatre we have a computer screen opposite where we're operating, and we always operate with a screen in front of us to tell us where we think lesions are. We will correlate what we see during surgery or what we feel during surgery with what was thought to have been there in the pre-surgery stage, whatever imaging we were using.
>
> So here I felt two lesions. You will see the findings in line number 2:
>
> "*2 cm well-demarcated indurated area at head of pancreas/uncinate process corresponding to the Gallium Dotatate scan.*"
>
> So it was *quite well-demarcated* in palpation, it *wasn't a vague fullness or a vague induration*. It was a *well-demarcated induration*.
>
> Number two, which is the third sentence:
>
> "*Separate 1 x 0.5 cm distinct indurated area at mid body superior surface cranial edge*".
>
> Superior surface means in the front of the pancreas facing the patient's front, cranial edge means on the top border towards the head rather than towards the feet.
>
> And to illustrate further I drew a diagram which cannot be drawn on the computer system either but was drawn after it was printed in the operating theatre itself. The diagram shows you where I felt the indurations to be and the plan resection line that was taken."
>
> So that was done during surgery. This report was done after surgery was over. The palpation was done during surgery.
>
> [emphasis added]

139 In terms of diagnostic tools, apart from the results of the plaintiff's Gallium scan, by the time Prof Ooi eventually proceeded with the Whipple Surgery, he also received indication from his palpation of the pancreas that there were lesions that needed to be removed. It is significant that the indurated areas

for both lesions were positively found by Prof Ooi to be distinct and well-demarcated. However, as accepted by Prof Ooi, the palpation did not enable him to distinguish between PNETs and hyperplasia. In fact, as it has been seen thus far, other that post-operative histopathology, none of the diagnostic tools (including MRI scan, CT scan and IOUS) are able to distinguish between PNETs and hyperplasia. So the argument that Prof Ooi should have realised that there was absolutely no PNETs or other serious complications relating to the pancreatic lesions in light of the negative IOUS results is not tenable for the same reasons already discussed in the context of why a negative CT or MRI scan would not displace suspicion of PNETs in light of positive findings in the plaintiff's Gallium scan (see [118] – [119] above), which was also supported by the added positive findings of two distinct and well-demarcated indurations corresponding to the two areas of focal uptake shown on the plaintiff's Gallium scan.

140 As noted, Prof Modlin was the plaintiff's expert in the field of surgery. He gave evidence that induration of the pancreas is "a highly subjective phenomenon and difficult to appreciate with any degree of objectivity at surgery especially if wearing gloves."[84]

141 Prof Büchler and Prof Madhavan were Prof Ooi's experts on the issue. Prof Büchler however stressed the importance of palpation in the hands of an experienced pancreatic surgeon to feel for a solid lesion or tumour before deciding on the next surgical steps. His evidence was as follows:[85]

> Q. Can you tell us why, to a surgeon, more weight would be placed on the palpation than the IOUS?

[84] Prof Modlin's AEIC, p 212.

[85] Transcript dated 2 September 2015, pp 37 – 38.

> A. Yes, I mean, the experienced surgeon is what is needed for pancreatic surgery. Pancreatic surgery is quite demanding, probably the most demanding surgery when it comes to operations within the belly. Pancreatic surgery is the most demanding, and therefore the palpation of the gland, of the pancreas is so important. And you can palpate the whole gland very carefully, and then you see the pancreas looks normal at certain parts and then it does not look normal here at another part, and then you feel a solid lesion, a tumour, and only then you decide.
>
> So this is, I want to say, the most important decision-making during the operation. It's more important than any other kind of decision-making during the operation, but the restriction is it must be an experienced pancreatic surgeon, because the residents and the younger surgeons, they do not have the experience to differentiate between normal and not normal.

142 Prof Büchler also gave evidence on whether Prof Ooi should have proceeded with surgery in light of the negative IOUS:[86]

> Q. When it comes to the actual surgery, an intraoperative ultrasound was carried out.
>
> A. Yes.
>
> Q. Which did not demonstrate a mass.
>
> A. Yes.
>
> Q. Shouldn't the surgery have stopped there rather than proceeding to carry out a Whipple surgery?
>
> A. This is an important question, because it shows how surgery is placed, how surgery is applied. A surgeon palpates the pancreas, looks at the pancreas, explores the pancreas, from different sides, and the palpation is also from different sides. Then the surgeon can also do an intraoperative ultrasound. There is no "must". He can do this. This is giving further aspects. Thereafter, he or she decides to do a resection or not.
>
> *The palpation of the pancreas is an important step to decide what kind of surgery I will apply. The palpation is*

[86] Transcript dated 3 September 2015, pp 110 – 111.

> *an important step for the right decision-making*. Therefore, the intraoperative steps will come to a decision where the right steps, and then the decision for surgery, ie, removal of the pancreatic head and enucleation of the pancreatic body were made.
>
> [emphasis added]

143 I also note that when asked during cross-examination on whether the IOUS has replaced palpation, Prof Madhavan's evidence is that the IOUS has not replaced but has complemented palpation.[87] Prof Madavan's view is logically held and supported by literature that suggests that IOUS and palpation are complementary diagnostic tools. In this regard, I note the reference to Jeffrey A. Norton *et al*, "Intraoperative Ultrasonographic Localization of Islet Cell Tumors: A Prospective Comparison to Palpation" (1988) 207(2) Ann Surg. 160. It was there stated at 168 as follows:

> In conclusion, even though palpation was the single best localization method because of equal sensitivity within the pancreas and better sensitivity outside the pancreas, the present results demonstrate that, in fact, palpation and IOUS are complementary because IOUS detects some tumours that are not palpated and can provide information concerning malignant potential not detected by palpation.

144 I have the task of weighing the evidence of Prof Modlin, on the one hand, and Prof Büchler and Prof Madhavan, on the other, in deciding on the utility and diagnostic value of palpation. It is uncontroversial that this issue pertained exclusively to the realm of surgery. Prof Modlin agreed at trial that his evidence had "to be seen in the context of the fact that [he had] done very little surgery [himself] in the past ten years, and absolutely none in the past five years".[88] Many of the comments made by Prof Modlin are therefore not based

[87] Transcript dated 15 September 2015, p 66.

[88] Transcript dated 6 May 2014, pp 168 – 169.

on his own experience. On the other hand, Prof Büchler is a practising surgeon. He stated in evidence that he had done 1,000 Whipple procedures during his entire career and 600 of them in the last ten years.[89] Prof Büchler's department at the Heidelberg University Hospital had performed 8,000 pancreatic operations in the last 14 years, and is the largest pancreatic surgery centre in the world. As the issue of palpation relates to surgery, I prefer Prof Büchler's views as he has the necessary extensive practical experience to support them. His view on the diagnostic value of palpation is also supported by the academic literature.

145 Turning to the separate allegation that an intraoperative core biopsy should have been carried out, I analyse the evidence of the pathologists. As noted, Prof Klimstra was the plaintiff's expert on pathology. While Prof Klimstra's evidence seems to be that an intraoperative core biopsy should have been done, he agreed that there would not have been time to do the "special stainings" required to differentiate between PNET and hyperplasia intraoperatively.[90] Therefore, the issue of an intraoperative core biopsy, apart from being not pleaded, is a complete red herring in the present case, as it would not have provided any useful diagnostic information. In fact, it has not escaped my notice that a biopsy of a frozen section was performed intraoperatively. Prof Ooi's intraoperative record of the pathologist's comments were: "[a]reas of induration noted as specified but no distinct tumour on sectioning, [frozen section] shows endocrine islets – ? hyperplasia versus tumour".[91] The pathologist still could not differentiate between hyperplasia and PNETs from the biopsy of the frozen section, which was the reason for the pathologist's

[89] Transcript dated 2 September 2014, p 4.

[90] Transcript dated 1 October 2014, p 117.

[91] 1 DCB 137.

insertion of a question mark. It is therefore clear that an intraoperative core biopsy, even if performed prior to resection of the pancreatic lesions, would similarly not be able to differentiate between the clinical diagnosis and differential diagnosis. Instead, it would have raised suspicion on some abnormality in the pancreatic lesions. More importantly, the pathologist in his report on the frozen section biopsy could not and did not exclude the possibility of a PNET but in fact included "tumour" as a possibility together with "hyperplasia". I note that the plaintiff did not pursue the allegation that an intraoperative core biopsy prior to resection of the pancreatic lesions ought to be performed in his closing and reply submissions.

146 The plaintiff also initially suggested that other tests, including the Chromogranin-A ("CgA") test and the carbohydrate antigen 19-9 ("CA19-9") test, should have been performed in the present case. The plaintiff's own witness, Prof Modlin, described the CgA test to be "useless" in relation to the diagnosis of PNETs.[92] The allegations that further tests such as the CgA test and the CA19-9 test should have been performed was also not canvassed in the plaintiff's closing and reply submissions.

*Applying the legal test*

147 Having set out the evidence of the medical experts on the efficacy of the various diagnostic tools, I now proceed to analyse if the defendants were negligent in omitting to carry out any further tests and in arriving at the clinical diagnosis and differential diagnosis based on the information that they had. In this regard, the focus would be on the Tumour Board's Diagnoses and Advice

[92] Transcript dated 7 May 2014, p 21.

and Prof Ooi's intraoperative diagnostic findings. I will further analyse whether surgery was indicated based on the clinical and differential diagnoses.

148 Prof Modlin, the plaintiff's expert on surgery was in his expert report critical of the fact that the "physicians at [the NCCS]" decided to rely solely on the plaintiff's Gallium scan in light of the negative results obtained from the plaintiff's MRI scan. He contended that they should have realised that the results from the plaintiff's Gallium scan could be false positives. He was of the view that, *inter alia*, a pre-operative EUS and an intraoperative biopsy should have been conducted prior to the surgical resection of the pancreatic lesions.[93]

149 Dr Bodei, the plaintiff's expert on nuclear medicine, considered that there was no evidence of the presence of a PNET. She said that a complex surgical procedure, *ie*, the Whipple Surgery, was not justified by the information obtained from the plaintiff's Gallium scan. She opined that there was a need to reassess the matter in six months. She was of the view that the IOUS should have further warned Prof Ooi that the Whipple Surgery should not have been proceeded with.[94]

150 Prof Klimstra, the plaintiff's expert on pathology, was of the view that an EUS-FNA, if carried out, would have shown that the plaintiff had a "normal pancreas" and did not have a PNET. He opined that an intraoperative biopsy would have revealed the same. In this regard, he noted that "special staining" during the intraoperative biopsy would have allowed the differentiation between PNETs and hyperplasia.[95] He took the view that there was insufficient evidence

[93] Prof Modlin's AEIC, pp 210 – 211.

[94] Dr Bodei's AEIC, p 180.

[95] Prof Klimstra's AEIC, p 88 (para 12).

to justify surgical resection of the pancreatic lesions as the plaintiff's MRI scan was negative, there were no elevations in the serum biomarkers for NETs, the pancreas at surgery did not contain a grossly visible tumour mass and the IOUS was negative.[96]

151 The thrust of the evidence of the plaintiff's experts is that the defendants did not act reasonably and in accordance with accepted standards of practice in reaching their diagnoses and in advising the plaintiff as there were many factors suggesting that the plaintiff might not be suffering from PNETs. The defendants failed to carry out further tests such as the EUS-FNA and an intraoperative core biopsy that would have provided further evidence that the plaintiff did not have PNETs.

152 Prof Modlin was of the view that anything in the email exchanges between the plaintiff and the defendants was not relevant to his analysis as an expert. His opinion was based solely on the medical records provided to him and he did not see the need for anything else to be considered including the emails. This is unfortunate. Often in litigation, the court has to take into account what parties allege was said at the material time when assessing the quality and reasonableness of the advice and recommendations rendered to the patient on his medical condition. In the present case, there are, before this court, contemporaneous email exchanges showing (a) the many factors that were taken into account by the defendants in arriving at the clinical diagnosis and differential diagnosis; (b) the advice and recommendations that were received by the patient; and (c) why certain tests were considered, discussed with the plaintiff and eventually not proceeded with. To my mind, such discussions and

[96] Prof Klimstra's AEIC, p 88 – 89 (para 13)

deliberations would have formed part of the medical record were the doctor and patient in a face-to-face consultation as the doctor would then have made contemporaneous notes of his discussions with the patient. In the case of an overseas patient, the consultation may also take place for convenience via email, and I do not see why such emails cannot form part of the medical record for consideration by the expert when giving his expert opinion. The fact that Prof Modlin chose to give evidence disregarding all these email exchanges[97] impacts the weight that can be assigned to his evidence on whether the defendants had properly informed the plaintiff of his medical condition and on whether the alternatives offered to the plaintiff were reasonable. This is, of course, quite apart from the fact that Prof Modlin had done no surgeries at all in the last five years and little surgery in the last ten years (see [144] above). This has to be contrasted against Prof Büchler who had done 600 pancreatic surgeries in the last ten years. However, I do note that Prof Modlin eventually said that his opinion remained unchanged despite considering the emails, which he was aware of.

153 Dr Bodei accepted that the emails constituted advice to the patient and covered issues relating to diagnosis.[98] However, Dr Bodei does not appear to have considered the Tumour Board's deliberations as set out in the email containing the Tumour Board's Diagnoses and Advice as she annexed in her AEIC all the documents she considered in reaching her opinion and none of the email correspondence was included. I must highlight that it is important that all relevant evidence must be put before the expert for him or her to comment on. It might well be the case that a more favourable opinion might be elicited by

[97] Transcript dated 7 May 2014, p 171.

[98] Transcript dated 9 May 2014, pp 60 - 61.

narrowing the documents that are considered by the expert; however, the court would have to discount the weight of an expert's opinion if it finds that the expert did not consider all the relevant material in reaching his or her opinion.

154 Prof Büchler took the view that the diagnoses of the Tumour Board were reasonable. He reasoned that the plaintiff's Gallium scan showed that there were two bright hotspots. He said that this must be viewed in the context of the rest of the pancreas where there were no other hotspots. I reproduce his evidence:[99]

> A. But it's so obvious, this scan. If we would have seen this obvious scan in Heidelberg, in our tumour board we would have come to the same conclusion, namely sent him to surgery, *because it is so obvious there are two lesions, and the SUV, which you know what it is, is the amount of opacification, the SUV is so very high that it is -- it can always be a false positive, but it is not expected* to be a false positive, because we see many scintigraphies with some vague opacification at some place here or there, where the physicians say there is something here, but we are not sure.
>
> This scan of this patient we discuss here is so, I want to say, impressive, because it shows these two --
>
> …
>
> A. So bright and so clear that we certainly would discuss a false positive. But I mean how should -- a false positive scintigraphy always comes from vague opacification somewhere, where they say it's little bit more than normal, we are not sure, but it can be -- but this is not this case.
>
> *This case is so clear, there is nothing in the whole pancreas except the two hotspots, so this is not a case that is regarded likely for false positive.* It's a case that is regarded clear-cut sign of disease.
>
> [emphasis added]

155 It was then suggested to Prof Büchler that the clinical diagnosis of the Tumour Board was not reasonable because of the following reasons: (1) the

[99] Transcript dated 2 September 2015, pp 150 – 151.

finding of two primaries is very rare; (2) the plaintiff's MRI scan showed a negative result; and (3) the CT scan that accompanied the plaintiff's Gallium scan also showed a negative result. Prof Büchler disagreed. His evidence in response is as follows:[100]

> I repeat that again. We had a clear-cut history of a neuroendocrine tumour proven in the lung long before; number one. Number two, we had the Dotatate diagnostic with two hotspots in the pancreas that should not be there. This is absolutely unusual.
>
> So we do not deal only with a hotspot in the pancreatic head; we have two hotspots -- pancreatic head and body. That is something that is very suspicious for a neuroendocrine lesion in the pancreas or two.
>
> And then we have the discussion in a tumour board, which was a very valid discussion under non-surgeons about what is the right decision for the patient. Then a decision was made for an exploration surgery.
>
> …
>
> This is a very concrete, step-by-step, well-balanced attitude to approach such a patient. And for me, not living in this country but working in a centre comparable to this here, this is the right approach.

156 According to Prof Büchler, the presence of two "absolutely unusual" hotspots in the pancreas would have raised the index of suspicion in relation to the existence of NETs. Prof Büchler also highlighted that while the "wait and see" approach would be an alternative to the Whipple Surgery, this did not render the option of surgery any less reasonable. Prof Büchler's view was supported by academic literature, *viz*, Joshua S. Hill *et al*, "Pancreatic Neuroendocrine Tumors: The Impact of Surgical Resection on Survival" (2009) Cancer 741 where it is noted at 742 as follows:

[100] Transcript dated 3 September 2015, pp 81 – 82.

> The mainstay of treatment for PNETs is surgical resection. Patients who have undergone resection have been reported to have a decreased likelihood of future metastasis and disease-specific death compared with patients who did not undergo resection. …

157 In any case, I note that the merit of the "wait and see" strategy is something better analysed under the rubric of whether the defendants had been negligent in their advice. Prof Büchler was also able to enlighten the court that only less than 1% in a sample of about 400 patients who were surgically operated for PNETs were found to have hyperplasia.[101] This is probably the best statistical data that one has to work with as Prof Büchler has a concurrent appointment at the European Pancreatic Centre in Heidelberg, Germany, which is the largest pancreatic surgery centre in the world. This information is useful in elucidating how rare the condition of hyperplasia is. When evaluating probabilities and the index of suspicion and when confronted with two possible conditions which the pre-operative tests cannot reasonably differentiate, I accept that the condition that is far more common would be more reasonably indicated to the patient as the clinical diagnosis than the other condition that is very rare. I think that it is neither logical nor reasonable to offer a diagnosis that the much rarer condition is the more likely condition when the available tests cannot distinguish between the two conditions.

158 Prof Virgolini also commented on the diagnoses of the Tumour Board. She agreed that the diagnoses of the Tumour Board as reported in the email containing the Tumour Board's Diagnoses and Advice was an "accurate way of stating the position."[102] Prof Virgolini then stated that she shared the view of the

[101] Transcript dated 2 September 2015, pp 6 – 7.

[102] Transcript dated 8 September 2015, pp 46 – 47.

Tumour Board that the clinical diagnosis for the PB lesion would be PNETs in light of tracer uptake in the plaintiff's Gallium scan. In that process, she noted that she had seen at least 2,000 Gallium scans in her experience. She said that surgery was indicated for the PB lesion and the tumour board in her institution would have recommended the same. As regards the PU lesion, she agreed with the view of the Tumour Board that the differential diagnosis of hyperplasia could not be ruled out.

159 Prof Madhavan was also challenged that it was not reasonable to conclude that the plaintiff had PNETs given that the plaintiff's MRI scan produced negative results. Prof Madhavan disagreed. He took the view that the background of a NET in the lung and the appearance of two lesions in the pancreas in the plaintiff's Gallium scan were factors that the Tumour Board rightly considered in reaching their diagnoses. He considered that the occurrence of hyperplasia was so rare that it was reasonable to come to the conclusion that the lesions in the plaintiff's pancreas represented PNETs.[103]

160 Similarly, Dr Foo, a Senior Consultant Medical Oncologist at Parkway Cancer Centre who gave expert evidence for the 2nd defendant, agreed with the diagnoses and proposed treatment plan of the Tumour Board.[104]

161 After having analysed and weighed the evidence of the experts, I find that the NCCS was not negligent in reaching (a) its clinical diagnosis, *ie*, that the plaintiff suffered from PNETs in the pancreas; and (b) its differential diagnosis, *ie*, that the PU lesion might be hyperplasia. The NCCS was also not negligent in formulating its proposed treatment plan where it suggested

[103] Transcript dated 15 September 2015, pp 85 – 86.

[104] Transcript dated 16 September 2015, p 44.

proceeding with the resection of PB lesion and discussing the options relating to the PU lesion with Prof Ooi. Prof Ooi in turn was not negligent in proceeding with the resection of both lesions of the pancreas having regard to the results of the plaintiff's Gallium PET/CT scan, the Tumour Board's Diagnoses and Advice and his palpation of the pancreas notwithstanding negative findings in the plaintiff's CT scan (done during the combined scan, *ie*, the plaintiff's Gallium PET/CT scan), the MRI scan and the IOUS. Let me elaborate.

162 As noted at [108] above, the Gallium scan is the most sensitive and advanced diagnostic tool available for the detection of PNETs. This still remains the case even after taking into account the 8% chance of a false positive result as noted in the Castellucci paper which was referred to by Prof Virgolini (see [111] above). While there was some dispute as to the relevant "cut-off" value in relation to the SUVmax value for the uncinate process, both Prof Virgolini and Dr Bodei however agreed that the SUVmax value for the PU lesion in the plaintiff's Gallium scan was nevertheless pointing in the malignant direction. I also note that the state of learning at the time of the Tumour Board's Diagnoses and Advice is contained in the Prasad & Baum paper. Based on that paper, which suggested a "cut-off" value of 8.6 for PNETs, it is more than clear from the SUVmax values in the plaintiff's Gallium scan that the tracer uptakes in the PU lesion (with SUVmax of 23.0) and, *a fortiori*, the PB lesion (with SUVmax of 13.2), which generally does not lend itself to false positives, are not likely to be physiological. Additionally, as noted by Dr Büchler, the index of suspicion in the plaintiff's case would have been raised by the fact that the plaintiff's Gallium scan showed two clear hotspots in the pancreas. I therefore find that the defendants' heavy reliance on the high positive predictive value of the plaintiff's Gallium scan is in no sense misplaced or negligent. In this regard, I

accept the evidence of Prof Virgolini, Dr Bodei (to the limited extent outlined) and Prof Büchler.

163 Insofar as the plaintiff suggests that the negative results from the plaintiff's CT and MRI scans and the IOUS should have displaced the diagnoses reached by the defendants of his condition and that that had made the defendants negligent, I accept Prof Büchler's reasoned evidence at [155] above on why the diagnoses of the Tumour Board still stood notwithstanding the negative findings in the plaintiff's CT and MRI scans and the IOUS. The weight of the expert evidence appropriately supported by the medical literature demonstrates quite clearly to me that the Tumour Board was entitled to reach the clinical diagnosis and the differential diagnosis notwithstanding the negative findings in the plaintiff's CT and MRI scans and the IOUS because of the limitations of CT and MRI imaging and IOUS as noted at [118] and [137] above.

164 As to the issue of whether the defendants were negligent in not conducting an EUS-FNA, I articulate the view that the defendants were not negligent in not recommending the EUS-FNA. In this regard, after analysing the entirety of the pathological evidence (at [124] – [127] above), I am not satisfied that the EUS-FNA would have provided any useful diagnostic information as it is not able to differentiate between PNETs and hyperplasia. This is quite apart from the difficulty of targeting the lesion which would not show up on the EUS and hence would result in a higher probability of sampling error for the biopsy. As stated at [128] above, I accept Prof Pitman and Dr Bergmann's evidence over Prof Klimstra's. I note in this regard that there is no supporting literature to show that the EUS-FNA could have differentiated between hyperplasia and PNETs. I am also unable to accept Prof Klimstra's

hypothetical "cut-offs" as a guide in determining whether a diagnosis of PNETs as opposed to hyperplasia can be made on the back of an EUS-FNA.

165 In any case, as will be noted below (at [248]), it is not as if the plaintiff knew nothing about the EUS-FNA's lack of positive diagnostic utility in his case. In this regard, I note that after the plaintiff, Dr Tan and Prof Ooi eventually discussed the EUS-FNA, the plaintiff proceeded for the Whipple Surgery without the ESU-FNA as he took the view that it would not provide any useful diagnostic information that would allow him to reach an informed decision of whether to proceed with the Whipple Surgery. The expert evidence adduced during the trial only confirmed this conclusion: the EUS-FNA would not have provided any diagnostic information that would enable one to differentiate between PNETs and hyperplasia.

166 As regards Prof Ooi's failure to not proceed with the Whipple Surgery after the negative IOUS, I accept Prof Büchler's evidence that the palpation of the pancreas is a good diagnostic tool in the absence of a positive IOUS. Prof Ooi did palpate the pancreas and felt the indurations in the pancreatic lesions. Therefore, Prof Ooi was reasonably entitled to rely on his findings during the palpation of the pancreas prior to the resection of the pancreatic lesions.

167 In relation to the treatment plan, while Prof Modlin's view was that surgery was not indicated in the plaintiff's case, as noted at [80] above, he also accepted that PNETs are like, to put it metaphorically, "sleepy… cats" and it is not possible to tell when they will "behave terribly". Prof Büchler, a surgeon with immense experience, highlighted that surgery should be indicated in the plaintiff's case for both pancreatic lesions given that there was no way of differentiating between the relatively more common PNETs and the much rarer

hyperplasia, short of a post-surgical histopathological analysis. I accept Prof Büchler's evidence that it was logical that surgery was eventually indicated for both lesions of the pancreas by Prof Ooi as it was not possible to tell if either of the pancreatic lesions were not PNETs. In this regard, I note that in the Tumour Board's Diagnoses and Advice, the decision of whether surgery should be indicated for the PU lesion was left to be discussed between Prof Ooi and the plaintiff.

168 Prof Büchler also seemed to suggest that surgery should be performed even if the relevant lesion was not a PNET but hyperplasia as hyperplasia is likely to be a precursor lesion for PNETs.[105] He however highlighted that one would have no way of knowing this in any case. The medical literature in support of this latter proposition still appears to be in flux. In this regard, I was referred to Debra Ouyang *et al*, "Pathologic pancreatic endocrine hyperplasia" (2011) 17(2) World Journal of Gastroenterology 137 ("the Debra paper"). The authors there noted at 141 as follows:

> It is not clear if pancreatic endocrine cell hyperplasia represents precursor lesions for [PNETs]. Diffuse endocrine hyperplasia, dysplasia and microadenoma are present in the pancreas of patients with MEN1 and VHL, and are indeed considered as precursor lesions.

169 Dr Bergmann's evidence was similar. He prefaced his discussion by highlighting that there is little research on hyperplasia because of its rarity as a condition. Dr Bergmann also referred to the Debra paper. He pointed out that the patients in five of the nine cases where hyperplasia was found also had PNETs. He accepted that it is unclear whether this showed that there is an

[105] Transcript dated 2 September 2015, p 115.

association or causal link with hyperplasia, but nevertheless made the point that hyperplasia could represent a precursor lesion for PNETs.[106]

170 While there are suggestions that hyperplasia *could* represent a precursor lesion for PNETs, I do not intend to rely on this part of Prof Büchler or Dr Bergmann's evidence as it cannot still be stated with a fair degree of confidence that hyperplasia represents a precursor lesion for PNETs.

171 As regards the additional argument raised that Prof Ooi should have also performed an intraoperative core biopsy, it is sufficient to highlight Prof Klimstra's evidence noted at [145] above that the "special stainings" required to differentiate between PNETs and hyperplasia could not be done timeously. In fact, as highlighted, the intraoperative biopsy of the frozen section that was carried out during the Whipple Surgery could not differentiate between PNETs and hyperplasia.

172 All in all, I am of the view that the diagnoses of the Tumour Board, *viz*, the clinical diagnosis of PNETs for the pancreatic lesions and the differential diagnosis of hyperplasia for the PU lesion are reasonable and logically arrived at when careful consideration is given to the patient's history, the results obtained from the various tests done, and the efficacy and limitations of each of those tests including those which could be carried out but were not. The diagnoses of the Tumour Board are supported by the opinions of leading medical experts in the relevant areas of specialisation and the opinions offered by these experts are entirely defensible. Prof Ooi's view that surgery was

[106] Transcript dated 3 October 2014, pp 97 – 98.

indicated for both lesions is reasonable and supported by the evidence of Prof Büchler, who has vast surgical experience.

173 I must also highlight that the Tumour Board is, at the end of the day, an inter-disciplinary gathering of a body of medical practitioners with the relevant medical expertise and specialisation who gathered specifically to discuss a complex and difficult case before them. They in turn analysed the case from multiple dimensions and weighed various inter-disciplinary concerns before forming a consensus opinion on the way forward. Given the rigorous analytical process involved in the development of a consensus opinion by the Tumour Board, the plaintiff has not satisfactorily shown to me how the Tumour Board in their shared wisdom had not arrived at a logical or reasonable consensus opinion.

**The defendants were not negligent in their advice to the plaintiff**

174 Much of the trial and submissions centred on whether the defendants were negligent in reaching the diagnoses. None of the experts seriously argued that the advice given by the defendants was not reasonable. The central criticism against the defendants by Prof Modlin was that an additional option of waiting for three months, which he considered to be a "reasonable strategy", should have been offered to the plaintiff.[107] Dr Bodei took the view that "a higher degree of caution"[108] had to be observed in dealing with the plaintiff. Her criticism *appears* to be that there was an insufficient degree of caution observed in advising the plaintiff. The plaintiff raises the following few areas where he

[107] Prof Modlin's AEIC, p 211.

[108] Dr Bodei's AEIC, p 180.

argues that the defendants had breached their duty of care in relation to their medical advice to him:

(a) the findings of the plaintiff's Gallium PET/CT scan and the MRI scan;

(b) the findings from various other tests including the CgA and CA19-9 tests; and

(c) the failure to obtain his informed consent prior to the Whipple Surgery.

175 I note that item (b) is no longer pursued by the plaintiff. This is because Prof Modlin, his own expert, was of the view that these tests are "useless" (see [146] above).

176 The court need only consider, under the current law as set out in *Khoo James v Gunapathy*, whether the advice rendered by the defendants can be accepted as proper and reasonable by a body of responsible medical experts and whether the opinions of those experts are defensible when the test of logic is applied. In relation to the issue of informed consent raised by the plaintiff, under the current law, I need only consider whether the advice of the defendants, on the risks of the Whipple Surgery and the alternatives to surgery available to the plaintiff, is considered proper and reasonable by a responsible body of medical experts.

177 In the present case, Dr Foo,[109] Prof Madhavan,[110] Prof Virgolini[111] and Prof Büchler[112] are in agreement that the advice rendered by the defendants is appropriate and reasonable. Prof Modlin's view has already been set out above. Dr Bodei only highlighted that the overall clinical picture of the plaintiff necessitated "a higher degree of caution".[113] The pathologists do not feature in this discussion as their evidence related solely to the diagnostic value of the EUS-FNA.

178 The medical experts did not dissect aspects of the advice given by the defendants to the plaintiff to argue that any one part was not appropriate, proper or reasonable. The sensible approach to this issue would be to recapitulate the advice that was given to the plaintiff and analyse whether the opinion of Dr Foo, Prof Madhavan, Prof Virgolini and Prof Büchler that the advice given by the defendants was appropriate and reasonable is logically held and whether their opinions are in any material sense undermined by the alleged criticisms set out in Prof Modlin and Dr Bodei's opinion as to the appropriateness, reasonableness and defensibility of the defendants' advice.

### *The plaintiff was properly advised on the efficacy of the diagnostic tools including the findings from the plaintiff's Gallium PET/CT scan and MRI scan*

179 It must be remembered that the plaintiff is a savvy businessman. He, by his own admission, has a good understanding of the English language. It is also

[109] Transcript dated 16 September 2015, p 44; Dr Foo's AEIC, pp 19 – 20.

[110] Transcript dated 15 September 2015, p8; Prof Madhavan's AEIC, pp 47 – 48.

[111] Transcript dated 9 September 2015, pp 106 – 107; Prof Virgolini's AEIC, pp 24 – 25.

[112] Transcript dated 3 September 2015, pp 192 –193; Prof Büchler's AEIC, p 37.

[113] Dr Bodei's AEIC, p 180.

obvious from a review of his correspondence with Dr Tan and Prof Ooi, as well as his evidence on being told by Malaysian doctors that he had pancreatic cancer (see [97] above), that he sought advice from multiple sources and actively researched his medical condition on the Internet. The plaintiff's broad complaints are that he was not properly advised on the findings of the plaintiff's Gallium PET/CT scan and MRI scan and that his informed consent was not obtained prior to the Whipple Surgery. I set out the advice rendered by each defendant respectively.

*Advice given by Prof Ooi*

180 The first time the plaintiff received advice from Prof Ooi was after his consultation with Dr Koo at the NCCS. In that consultation, Prof Ooi explained and/or discussed the following with the plaintiff:[114]

(a) two surgical options of (i) a localised pancreatic resection of the PB lesion combined with a Whipple procedure to remove the PU lesion (*ie*, the Whipple Surgery); or (ii) a total pancreatectomy (removal of the entire pancreas);

(b) how the resection and anastomosis in relation to the pancreatic surgery would be performed (with illustrations);

(c) the two sets of risks associated with surgery, those associated with general anaesthesia and those associated with the surgery;

(d) the risk of mortality was less than 5%; and

[114] DCB 65 – 68.

(e) the other non-surgical treatment options of radionuclear treatment and chemotherapy, as well as the palliative nature of chemotherapy.

181 In relation to point (c) above on risks, Prof Ooi identified, *inter alia*, the following risks flowing from general anaesthesia: anaphylaxis, acute myocardial infarction ("AMI"), cardiovascular accident ("CVA") or stroke, and lung problems in general. The plaintiff was informed that the risk of AMI and CVA were increased because he had hypertension. Prof Ooi also identified the following surgical risks flowing from the Whipple Surgery: a mortality risk of less than 5%, bleeding, infection, an anastomotic leak and pancreatitis.[115] To my mind, this is a very comprehensive list that highlights with caution all the significant risks that might materialise during the Whipple Surgery.

182 The plaintiff accepted during cross examination that the risks of surgery such as the 5% mortality risk were communicated to him by Prof Ooi during the consultation on 22 July 2010.[116] I find that the above discussion must have taken place between Prof Ooi and the plaintiff because when the plaintiff eventually sought Prof Ooi's opinion on the Tumour Board's Diagnoses and Advice, Prof Ooi cross-referred to many points that were previously discussed in his email reply to the plaintiff. I set out this advice again in full[117], which the plaintiff admitted had been clearly understood by him[118] at that time:

[115] DCB 67 – 68; Transcript dated 26 August 2015, pp 172 – 174.

[116] Transcript dated 23 April 2014, pp 143 –145.

[117] 6 AB 186 – 187.

[118] Transcript dated 29 April 2014, p 87.

(a) "*[A]s what we have previously discussed*", the pancreatic lesions should be addressed as a priority given that the growth and activity of the lung lesions were slower than the pancreatic lesions.

(b) It was difficult to conclude whether the PB lesion and PU lesion represented NETs or hyperplasia from the plaintiff's Gallium PET/CT scan, as both lesions lit up on the plaintiff's Gallium scan. However, he felt that if they had to remove one they should also remove the other as it would not make sense to remove only one lesion.

(c) "*[A]s we previously discussed*", waiting six months for a repeat scan was an option, but the plaintiff would need to accept the risk of the pancreatic lesions turning out to be tumours with a potential of metastasis while waiting.

(d) The surgical morbidity and mortality of the Whipple Surgery would be higher than for the removal of the PB lesion alone in general, but surgeon and patient factors should also be taken into consideration.

(e) Younger and fitter patients, experienced surgeons and centres with higher volume of cases have better outcomes.

(f) "*[A]s explained to [the plaintiff] at the consultation, [when they went] through the surgical procedure and risks*" of the Whipple Surgery, while the Whipple Surgery carried risks, the plaintiff happened to be a good risk candidate in terms of expected outcome.

(g) He would be happy to proceed with the Whipple Surgery if the plaintiff was agreeable, or to discuss further on whether he wanted to

> leave one tumour (presumably, that which was supposedly in the PU lesion) and remove the other.

183 The plaintiff admitted in his evidence that he understood in particular the important point that Prof Ooi made in his email to him on the uncertainty and non-conclusiveness of the diagnoses, namely, "as both the uncinate and body lesions light up on PET it would be difficult for anyone to be conclusive on whether these represent tumours [*ie*, PNETs] or hyperplasia so if we have to remove one we should also remove the other, otherwise it does not make sense."[119]

184 On 10 August 2010, the plaintiff emailed Prof Ooi to ask about EUS-FNA. This suggests to me that the plaintiff must have been finding out from his other medical contacts or researching on the internet whether there was an investigative tool that could tell the difference and establish whether the pancreatic lesions were in fact PNETs or hyperplasia and he wanted to know if EUS-FNA could help in this regard. Thus, I find that the plaintiff cannot maintain that he was not made aware of the limitations of the diagnostic tools and the diagnostic difficulties surrounding his case.

185 Prof Ooi replied on the same day, and explained that the results of an EUS-FNA would only be useful if the results were positive. A negative result would not lead to a conclusion that it was safe to leave the lesions alone. In Prof Ooi's opinion, there was a slight risk with EUS-FNA and in the plaintiff's situation it may not be beneficial.[120]

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[119] Transcript dated 29 April 2014, p 88 and Prof Ooi's AEIC, p 185.

[120]6 AB 194.

*Advice given by the NCCS*

186 The central piece of advice given by the NCCS to the plaintiff was the Tumour Board's Diagnoses and Advice. Based on the Tumour Board's Diagnoses and Advice, it is clear that the Tumour Board was of the view that the PB lesion was likely to represent a NET while the PU lesion could be a NET or hyperplasia. The Tumour Board then provided the plaintiff with the option of (1) waiting for six months; or (2) resecting the PB lesion and discussing the surgical options in relation to the PU lesion with Prof Ooi. The Tumour Board also set out very clearly that the plaintiff had to consider "a balance of risk of possible [tumour] growth/spread versus surgical risks". By this time, the plaintiff was already fully apprised of the surgical risks because of his consultation with Prof Ooi on 22 July 2010.

187 Additionally, Dr Tan had also explained on 22 July 2010 that the discrepant findings between the plaintiff's Gallium scan and the plaintiff's MRI scan were not uncommon due to the fact that the Gallium scan looks at cellular function whereas the MRI scan or CT scan looks at anatomy. As a result, the Gallium scan may pick up cellular abnormalities even in instances where no anatomical changes have occurred.

188 The NCCS via Dr Tan also ensured that the plaintiff understood the risks that arose in his case. I note for example that in an email dated 8 August 2010,[121] Dr Tan explained to the plaintiff (in response to his queries) that there were always limitations with diagnostic imaging, with a possibility of false positives or false negatives. Dr Tan also explained that in the case of a Gallium scan, the concern was more with a false negative. He pointed out that the Tumour Board

[121] 6 AB 193.

did discuss if the PB lesion could have been a false positive, but eventually concluded that the lesion was real as the scan findings were quite clear. Dr Tan also explained very cautiously and carefully that the uncertainty relating to the PU lesion arose because the tracer uptake in the PU lesion could be due to a condition called hyperplasia, but he noted that the literature was not very conclusive on this. Dr Tan pointed out that the tracer uptake in the plaintiff's case was higher than what was expected even accounting for the possibility of hyperplasia, but nevertheless it could not be conclusively characterised as definitely a NET.

189 Additionally, in response to the plaintiff's queries on whether an EUS should be performed, Dr Tan also gave the plaintiff advice that he should seek a second opinion from Dr Tan YM, a senior consultant oncologic surgeon in private practice. Dr Tan expressed the opinion that an EUS alone might not be conclusive, and the plaintiff could consider an EUS guided needle biopsy or ERCP guided biopsy if that option was technically feasible.[122]

*Analysis*

190 I first address the criticism levelled by Prof Modlin and Dr Bodei before proceeding to analyse the advice rendered. I note that both Prof Ooi and the Tumour Board had put before the plaintiff the option of waiting for six months to see if there were any developments. While Prof Modlin seems to take the view in his expert report that an option of waiting for three months would have been reasonable, he accepts in cross-examination that he would have told the plaintiff to follow up on his pancreas in "three or six months".[123] That being his

[122] 6 AB 196 – 197.

[123] Transcript dated 8 May 2014, p 186.

evidence, his criticism of the defendants' advice falls away completely. Dr Bodei takes the view that "a higher degree of caution" had to be observed in dealing with the plaintiff. Presumably, her view extends to suggesting that the advice to the plaintiff was not rendered with sufficient caution. On the present facts, it can be seen that the defendants had been very cautious in their advice to the plaintiff. Having the plaintiff's condition specifically considered by a multi-disciplinary team of relevant medical doctors and specialists comprising the Tumour Board within the NCCS to obtain a consensus opinion already indicates to me that an extremely cautious and careful approach was taken in the plaintiff's case. The Tumour Board's Diagnoses and Advice and Dr Tan's emails to the plaintiff set out in a nuanced manner the risks of each of the options that the plaintiff would have to weigh and consider before making his decision. Dr Tan's explanation on the chance of false positives and his comprehensive and detailed emails to the plaintiff also show that there were considerable efforts made to ensure that the plaintiff understood the nuances that underscored his condition. When one reads the Tumour Board's Diagnoses and Advice and Dr Tan's emails on (i) the reason why the plaintiff's negative MRI scan does not displace the suspicion of PNETs (see [187] above) and (ii) the finer points relating to the Tumour Board's interpretation of the plaintiff's Gallium PET/CT scan (see [188] above), the plaintiff's argument that he was not properly advised on the findings of his Gallium PET/CT scan and his MRI scan seems spurious.

191 On the facts, I find that the plaintiff was informed and advised in detail on the findings of his Gallium PET/CT scan and MRI scan. He was also apprised by Dr Tan of the reasons for the discrepant findings between the plaintiff's Gallium scan and the plaintiff's CT and MRI scans.

192 In relation to the issue of informed consent, the Tumour Board's Diagnoses and Advice also went on to consider the options available to the plaintiff, *viz*, surgery or to wait for six months. This was, of course, in addition to the range of options that were set out to the plaintiff in his consultation with Prof Ooi on 22 July 2010. The Tumour Board's Diagnoses and Advice also set out the key risks that had to be balanced by the plaintiff (surgical risks and the risk of metastasis). The plaintiff had by then obtained detailed advice on the surgical risks of proceeding with the Whipple Surgery from Prof Ooi (see [181] above).

193 When the plaintiff raised the issue of biopsy *ie*, EUS-FNA, Dr Tan and Prof Ooi had appropriately advised him on the relative merits of pursuing a biopsy.

194 Having analysed the defendants' advice in totality, I find that it withstands the criticisms of Prof Modlin and Dr Bodei. I also agree with Dr Foo, Prof Madhavan, Prof Virgolini and Prof Büchler that the defendants' advice was proper and reasonable. I do not find that the defendants' advice and the experts' opinion in relation to the defendants' advice to be illogical or indefensible in any respect. I am of the view that the defendants are not negligent in the advice they rendered to the plaintiff in relation to the plaintiff's Gallium PET/CT scan and MRI scan, the diagnostic tests, the options available to him and the recommendation to perform the Whipple Surgery.

195 The plaintiff had all the necessary information and advice he needed to give his informed consent to the Whipple Surgery in the present case. In this regard, I note that the plaintiff was apprised of alternative options and the risks that he would have to balance such as surgical risks on the one hand and risk of

metastasis on the other. Prof Ooi also highlighted the relevant anaesthetic and surgical risks (including the risk of leak and the mortality risk). In fact, I note that according to Prof Madhavan, the actual mortality risk quoted by Prof Ooi at less than 5% was a conservative estimate as the real figure is lower. All in all, it is because of the defendants' detailed and comprehensive advice that the plaintiff was eventually able to make an "informed decision on the way forward"[124] to proceed with the Whipple Surgery.

**The approach under *Montgomery* and its application to the facts**

196 As noted at the outset of this judgment, the law in relation to a doctor's advisory role has seen some significant developments in other jurisdictions. An authoritative pronouncement on the extent of the duty of a medical professional to advise a patient of risks involved in a medical procedure and alternative treatment options is found in *Montgomery*. Before I discuss *Montgomery*, I would set out the position of English law as it was before the decision of *Montgomery.* This is found in the decision of the House of Lords in *Sidaway v Board of Governors of the Bethlem Royal Hospital and the Maudsley Hospital and others* [1985] 1 AC 871 ("*Sidaway*"). I pause to consider *Sidaway* in some detail, as the views of the majority therein represent the law in Singapore as it stands. In that case, the House of Lords had to consider the question of whether the approach in *Bolam* applied in relation to a failure to advise a patient of risks involved in a treatment.

[124] Dr Tan's AEIC, p 26.

***Sidaway***

197 In *Sidaway*, the appellant suffered from recurrent pain in her neck, right shoulder and arms. She underwent an operation. The operation carried a risk, which was put at between 1 – 2%, of damage to the spinal column and the nerve roots. In consequence of the operation, the appellant was severely disabled. The appellant claimed damages for negligence against the hospital and the executors of the deceased surgeon ("the surgeon"). She relied solely on the alleged failure of the surgeon to disclose or explain to her the risks inherent in the operation.

198 The English High Court and Court of Appeal considered that the surgeon had satisfied the *Bolam* test in not informing the appellant of the risk inherent in the surgery, as it was an accepted practice to refrain from informing patients of that risk. All the expert witnesses specialising in neurology agreed that the doctor's advice was supported by a responsible body of medical opinion.

199 The appellant appealed. She argued that a doctrine of informed consent, based on the patient's right to know of material risks, should apply instead of *Bolam* on the issue of advice. Under the doctrine of informed consent, which was set out in decision of US Court of Appeals, District of Columbia Circuit in *Canterbury v Spence* (1972) 464 F 2d 772 ("*Canterbury*") as well as the decision of the Supreme Court of Canada in *Reibl v Hughes* (1980) 114 DLR (3d) 1 ("*Reibl v Hughes*"), the patient has a right to be informed of material risks by the doctor. This doctor's satisfaction of the attendant duty would in turn be determined by the court, and not the medical profession.

200 The House of Lords held (Lord Scarman dissenting) that the surgeon was not in breach of duty in failing to inform the appellant of the risk inherent in the surgery because it was an accepted practice to refrain from informing

patients of that risk. The majority of the House of Lords therefore applied the *Bolam* test.

201 The position most consistent with the law *as it stands* in Singapore is found in the speech of Lord Diplock. He considered that any alleged breach of a doctor's duty of care towards his patient, whether it related to diagnosis, treatment or advice, should be determined by applying the test in *Bolam*. He opined (at 895) that:

> … [W]e are concerned here with volunteering unsought information about risks of the proposed treatment failing to achieve the result sought or making the patient's physical or mental condition worse rather than better. The only effect that mention of risks can have on the patient's mind, if it has any at all, can be in the direction of deterring the patient from undergoing the treatment which in the expert opinion of the doctor it is in the patient's interest to undergo. *To decide what risks the existence of which a patient should be voluntarily warned and the terms in which such warning, if any, should be given, having regard to the effect that the warning may have, is as much an exercise of professional skill and judgment as any other part of the doctor's comprehensive duty of care to the individual patient, and expert medical evidence on this matter should be treated in just the same way.* The *Bolam* test should be applied.
>
> [emphasis added]

202 I note also the judgment of Lord Bridge of Harwich (with whom Lord Keith of Kinkel agreed). Lord Bridge recognised the existence of the doctrine of informed consent in cases such as *Canterbury*. However, he regarded the doctrine of informed consent as being "impractical in application". He noted as follows, at 899:

> … I regard the doctrine as quite impractical in application for three principal reasons. First, it gives insufficient weight to the realities of the doctor/patient relationship. A very wide variety of factors must enter into a doctor's clinical judgment not only as to what treatment is appropriate for a particular patient, but also as to how best to communicate to the patient the

> significant factors necessary to enable the patient to make an informed decision whether to undergo the treatment. The doctor cannot set out to educate the patient to his own standard of medical knowledge of all the relevant factors involved. He may take the view, certainly with some patients, that *the very fact of his volunteering, without being asked, information of some remote risk involved in the treatment proposed, even though he describes it as remote, may lead to that risk assuming an undue significance in the patient's calculations*. Secondly, it would seem to me quite *unrealistic in any medical negligence action to confine the expert medical evidence to an explanation of the primary medical factors involved and to deny the court the benefit of evidence of medical opinion and practice on the particular issue of disclosure which is under consideration*. Thirdly, the objective test which [the doctrine of informed consent] propounds seems to me to be so imprecise as to be almost meaningless. If it is to be *left to individual judges to decide for themselves what 'a reasonable person in the patient's position' would consider a risk of sufficient significance* that he should be told about it, the outcome of litigation in this field is likely to be quite unpredictable.
>
> [emphasis added]

203 Notwithstanding his rejection of the doctrine of informed consent, Lord Bridge appears to have added a qualification to the application of the *Bolam* test. He opined as follows, at 900:

> ... It would follow from this that the issue whether non-disclosure in a particular case should be condemned as a breach of the doctor's duty of care is an issue to be decided primarily on the basis of expert medical evidence, applying the *Bolam* test. But I do not see that this approach involves the necessity 'to hand over to the medical profession the entire question of the scope of the duty of disclosure, including the question whether there has been a breach of that duty.' Of course, if there is a conflict of evidence as to whether a responsible body of medical opinion approves of non-disclosure in a particular case, the judge will have to resolve that conflict. *But even in a case where, as here, no expert witness in the relevant medical field condemns the non-disclosure as being in conflict with accepted and responsible medical practice, I am of opinion that the judge might in certain circumstances come to the conclusion that disclosure of a particular risk was so obviously necessary to an informed choice on the part of the patient that no reasonably prudent medical man would fail to make it.*

[emphasis added]

204 It was noted by the Court of Appeal in *Khoo James v Gunapathy* that Lord Bridge's qualification above is encapsulated in the *Bolitho* test. The Court of Appeal opined at follows (at [141]):

> … [Lord Bridge's] concern clearly was that the question of advice and disclosure should not be abdicated entirely to the medical profession. He took the view that if a risk was substantial and there was no cogent clinical reason why disclosure should not be made, the judge was at liberty to conclude that no respectable medical expert would have failed to make it. To our minds, Lord Bridge's comment seems very much a forerunner to the more general qualification made by *Bolitho*. At its essence the message is one and the same – even if the doctor's actions were supported by a body of medical opinion, the court would still examine the expert testimony to see if it was founded on a logical basis. Lord Bridge's qualification, in retrospect, seems quite clearly vindicated by and subsumed under the ruling in *Bolitho*.

205 Lord Scarman dissented in *Sidaway*, taking a diametrically opposite view from Lord Diplock. He opined as follows, at 884 – 885:

> … If, therefore, the failure to warn a patient of the risks inherent in the operation which is recommended does constitute a failure to respect the patient's right to make his own decision, I can see no reason in principle why, if the risk materialises and injury or damage is caused, the law should not recognise and enforce a right in the patient to compensation by way of damages. …

206 Lord Scarman then proposed his view on how English law should develop, at 889 – 890:

> … To the extent that I have indicated I think that English law must recognise a duty of the doctor to warn his patient of risk inherent in the treatment which he is proposing: and especially so, if the treatment be surgery. The critical limitation is that the duty is confined to material risk. The test of materiality is whether in the circumstances of the particular case the court is satisfied that a reasonable person in the patient's position would be likely to attach significance to the risk. Even if the risk

> be material, the doctor will not be liable if upon a reasonable assessment of his patient's condition he takes the view that a warning would be detrimental to his patient's health.

207 Though the Court of Appeal in *Khoo James v Gunapathy* did not elaborate further on the doctrine of informed consent, it confirmed after considering the decision of *Sidaway* (at [143]) that the *Bolam* test applied to the issue of medical advice in Singapore law.

***Montgomery***

208 I now turn to discuss *Montgomery*. In that case, the appellant was at the material time pregnant. She was also diabetic and of small stature. She was under the care of a consultant obstetrician and gynaecologist ("the doctor") who was in turn employed by the respondent-health board. When the appellant was told by the doctor that she was having a large baby, she raised concerns about vaginal delivery. She was not told about the risks of her experiencing mechanical problems during labour. Women suffering from diabetes are likely to have larger than normal babies, and there can be a particular concentration of weight on the babies' shoulders. The appellant's pregnancy was therefore regarded as a high risk pregnancy.

209 The appellant proceeded to give birth to the son. During the vaginal delivery, her son's shoulder could not pass through her pelvis. This is a condition known as shoulder dystocia. As a result of the shoulder dystocia, the son was born with cerebral palsy and paralysis of the arm. The appellant sued the respondent and sought damages from the health board on behalf of her son.

210 Her central argument in pursuing the claim was that her son's injuries were attributable, in particular, to the doctor's failure to advise her about the

risk of shoulder dystocia and of the possibility of delivery by elective caesarean section. It was known that diabetic women had a 9 – 10% risk of shoulder dystocia during a vaginal delivery. The doctor gave evidence that she did not tell the appellant of this risk as the risk of a grave problem resulting for the baby was very small and, if dystocia was mentioned, most women would ask for a caesarean section, which was not in their interest. She also stated that the appellant did not ask her "specifically about exact risks".

211 The Lord Ordinary rejected the appellant's claim. He held that the question of whether a doctor's omission to warn a patient of inherent risks of proposed treatment constituted a breach of the duty of care depended on whether the omission was accepted as proper by a responsible body of medical opinion, which should not be incapable of standing up to rational analysis. I pause to note that the Lord Ordinary applied the *Bolam – Bolitho* test, as I have in the present case.

212 On the facts, the Lord Ordinary held that since the appellant had not "raised questions of specific risks" involved in vaginal delivery, the doctor's omission to warn her of the inherent risks in such a delivery did not constitute a breach of her duty of care because, on the expert evidence, that omission was accepted as proper by a responsible body of medical opinion; and that, even if the appellant had been given advice about the risk of serious harm to her baby as a consequence of shoulder dystocia, it would have made no difference, since she would not have elected to have her baby delivered by caesarean section. The appellant appealed.

213 The UKSC first considered *Sidaway*. It opined (at [75]) as follows on the view expressed therein by the majority:

> Since *Sidaway's* case, however, it has become increasingly clear that *the paradigm of the doctor-patient relationship implicit in the speeches in that case has ceased to reflect the reality and complexity of the way in which healthcare services are provided, or the way in which the providers and recipients of such services view their relationship. One development which is particularly significant in the present context is that patients are now widely regarded as persons holding rights, rather than as the passive recipients of the care of the medical profession. They are also widely treated as consumers exercising choices*: a viewpoint which has underpinned some of the developments in the provision of healthcare services. …
>
> [emphasis added]

214 The UKSC also alluded to social and legal developments:

> 80 In addition to these developments in society and in medical practice, there have also been developments in the law. Under the stimulus of the Human Rights Act 1998, the courts have become increasingly conscious of the extent to which the common law reflects fundamental values. …
>
> 81 The social and legal developments which we have mentioned point away from a model of the relationship between the doctor and the patient based on medical paternalism. They also point away from a model based on a view of the patient as being entirely dependent on information provided by the doctor. What they point towards is an approach to the law which, instead of treating patients as placing themselves in the hands of their doctors (and then being prone to sue their doctors in the event of a disappointing outcome), treats them so far as possible as adults who are capable of understanding that medical treatment is uncertain of success and may involve risks, accepting responsibility for the taking of risks affecting their own lives, and living with the consequences of their choices.

215 The UKSC then decided (at [86]) that the analysis of the majority in *Sidaway* would no longer represent the law in England in so far as it treated the doctor's duty to advise the patient of the risks of proposed treatment as falling within the scope of the *Bolam* test.

216 The UKSC then set out (at [87]) the applicable test in analysing a doctor's duty to advise the patient of the risks of a proposed treatment as follows:

> … An adult person of sound mind is entitled to decide which, if any, of the available forms of treatment to undergo, and her consent must be obtained before treatment interfering with her bodily integrity is undertaken. *The doctor is therefore under a duty to take reasonable care to ensure that the patient is aware of any material risks involved in any recommended treatment, and of any reasonable alternative or variant treatments. The test of materiality is whether, in the circumstances of the particular case, a reasonable person in the patient's position would be likely to attach significance to the risk, or the doctor is or should reasonably be aware that the particular patient would be likely to attach significance to it.*
>
> [emphasis added]

217 However, the UKSC acknowledged at [88] that the doctor is entitled to withhold information on a risk from the patient if he "reasonably considers that its disclosure would be seriously detrimental to the patient's health". This was referred to as the "therapeutic exception". The doctor also, most obviously, would be excused from conferring with the patient in circumstances of necessity, such as when the patient is unconscious and the situation is an emergency.

218 I summarise for convenience the guidance provided by the UKSC in relation to the application of the test set out at [216] above:

> (a) The assessment of whether a risk is material cannot be reduced to percentages. The significance of a given risk is likely to reflect a variety of factors besides its magnitude such as the nature and consequences of the risk: at [89].

(b) The doctor's advisory role involves dialogue. The doctor's duty is not therefore fulfilled by bombarding the patient with technical information which the patient cannot reasonably be expected to grasp: at [90].

(c) The therapeutic exception should not be abused. It is a limited exception to the general principle that the patient should make the decision whether to undergo a proposed course of treatment: at [91].

219 On the facts, the UKSC held that it was incumbent on the doctor to advise the appellant on the risk of shoulder dystocia because it was a substantial risk (which stood at 9 – 10 %) and discuss with her the alternative of delivery by caesarean section. The doctor therefore was in breach of duty. The UKSC also found that the therapeutic exception was inapplicable on the facts because although the communication of the risk of shoulder dystocia might lead to a request for caesarean sections, the "therapeutic exception" was not intended to enable doctors to prevent their patients from taking an informed decision. As regards the question of causation, the UKSC held that, had the appellant been advised of the risk of shoulder dystocia, she would have elected to deliver her son by caesarean section.

***Other jurisdictions following a similar approach in relation to advice on material risks***

220 The approach of the Supreme Court of Canada to the issue of informed consent is set out in the decision of *Reibl v Hughes* (see [199] above). This position has in turn been followed by the High Court of Australia in *Rogers v Whitaker* (1992) 175 CLR 479 ("*Rogers*"). I summarise the position in both these cases by reproducing a short passage from *Rogers*, at 489 – 490:

> Whether a medical practitioner carries out a particular form of treatment in accordance with the appropriate standard of care is a question in the resolution of which responsible professional opinion will have an influential, often a decisive, role to *play; whether the patient has been given all the relevant information to choose between undergoing and not undergoing the treatment is a question of a different order. Generally speaking, it is not a question the answer to which depends upon medical standards or practices*. Except in those cases where there is a particular danger that the provision of all relevant information will harm an unusually nervous, disturbed or volatile patient, no special medical skill is involved in disclosing the information, including the risks attending the proposed treatment…
>
> [emphasis added]

221 As in *Montgomery*, the court in *Rogers*, *inter alia*, took the view that the doctor was under a duty to take reasonable care to ensure that the patient is aware of any material risks involved in any recommended treatment. This is not assessed by applying the *Bolam* test. The decision of *Rogers* also affected the applicability of the *Bolam* test in relation to diagnosis, treatment and care of patients; however, as noted in Kumaralingam Amirthalingam, "Medical Negligence and Patient Autonomy: Bolam Rules in Singapore and Malaysia – Revisited" (2015) 27 SAcLJ 666 at 671 ("*Kumaralingam*"), the legislative reforms in Australia have preserved the position in *Rogers* only in relation to the duty to inform a patient of material risks.

222 In *Foo Fio Na v Dr Soo Fook Mun & Anor* [2007] 1 MLJ 593 ("*Foo Fio Na*"), the Malaysian Federal Court (Putrajaya) held (at [36]) that "the [*Bolam* test] has no relevance to the duty and standard of care of a medical practitioner in providing advice to a patient on the inherent and material risks of the proposed treatment". The approach advocated in *Foo Fio Na* is similar to that in *Rogers* (see *Kumaralingam* at 678). The Malaysian Court of Appeal (Putrajaya) in *DOMINIC Puthucheary & Ors (personal representatives of the estate of Thayalan a/l Kanapathipillai) v Dr Goon Siew Fong & Anor* [2007] 5

MLJ 552 has interpreted (at [16]) *Foo Fio Na*'s rejection of *Bolam* as applying to all aspects of medical negligence (see also *Kumaralingam* at 678 – 679).

***Analysis on the present facts***

223 Applying the approach in *Montgomery*, I would have to analyse whether the defendants took reasonable care to ensure that the plaintiff was aware of any material risks involved in the Whipple Surgery and of any reasonable alternative or variant treatments. The test of materiality in turn is whether, in the circumstances of the particular case, a reasonable person in the plaintiff's position would be likely to attach significance to the risk, or the defendants were or should reasonably have been aware that the plaintiff would be likely to attach significance to it.

224 On the present facts, the defendants would not be negligent. In this regard, I note that most of the analysis that would be relevant in relation to this issue has already been discussed generally at [192] and [195] above. Nevertheless, for completeness, I summarise my views again.

225 There are two relevant sets of risks. The first relates to the risks flowing from the fact that diagnoses might not represent the actual condition of the plaintiff on post-operative histopathology. Then there are of course the risks that arise specifically in relation to the Whipple Surgery and the complications that might flow from it. In terms of alternatives, one would consider whether the key alternatives to Whipple Surgery were set out to the plaintiff.

226 On the facts, the defendants had clearly discharged their duty in advising the plaintiff on the material risks and available alternatives. On 22 July 2010

when the plaintiff consulted Prof Ooi, Prof Ooi explained and discussed the following with the plaintiff:[125]

(a) two surgical options of (i) a localised pancreatic resection of the PB lesion combined with a Whipple procedure to remove the PU lesion (*ie*, the Whipple Surgery); or (ii) a total pancreatectomy (removal of the entire pancreas);

(b) how the resection and anastomosis in relation to the pancreatic surgery would be performed (with illustrations);

(c) the two sets of risks associated with surgery, those associated with general anaesthesia and those associated with the surgery;

(d) the risk of mortality was less than 5%; and

(e) the other non-surgical treatment options of radionuclear treatment, and chemotherapy, as well as the palliative nature of chemotherapy.

227 In relation to point (c) above on risks, Prof Ooi identified, *inter alia*, the following risks flowing from general anaesthesia: anaphylaxis, acute myocardial infarction *ie,* AMI, cardiovascular accident *ie*, CVA, or stroke, and lung problems in general. The plaintiff was informed that the risk of AMI and CVA were increased because he had hypertension. Prof Ooi also identified the following surgical risks flowing from the Whipple Surgery: a mortality risk of less than 5%, bleeding, infection, an anastomotic leak and pancreatitis.[126] To my

[125] DCB 65 – 68.

[126] DCB 67 – 68; Transcript dated 26 August 2015, pp 172 – 174.

mind, this is a very comprehensive list that highlights with caution all the material risks that might materialise during the Whipple Surgery.

228 I then note that in the Tumour Board Diagnoses and Advice, the NCCS also set out the key risks that had to be balanced by the plaintiff (surgical risks and the risk of metastasis) before considering the Whipple Surgery. The plaintiff had by then obtained detailed advice on the surgical risks of proceeding with the Whipple Surgery from Prof Ooi (see [226] – [227). The Tumour Board's Diagnoses and Advice also went on to consider the options available to the plaintiff, *viz*, surgery or to wait for six months. This was, of course, in addition to the range of options that were set out to the plaintiff in his consultation with Prof Ooi on 22 July 2010 (see [226(e)] above).

229 To my mind, the plaintiff had all the necessary information and advice he needed to give his informed consent to the Whipple Surgery in the present case. He knew of all the material risks (and even minor risks) that might arise. A whole range of non-surgical options were presented to him. In this regard, I note that the plaintiff was apprised of alternative options and the risks that he would have to balance such as surgical risks on the one hand and risk of metastasis on the other. Prof Ooi also highlighted the relevant anaesthetic and surgical risks (including the risk of leak and the mortality risk). In fact, I note that according to Prof Madhavan, the actual mortality risk quoted by Prof Ooi at less than 5% was a conservative estimate as the real figure is lower.

230 I also note that, in resonance with *Montgomery*, the defendants did not just bombard the plaintiff with technical information. The advice to the plaintiff on the risks he had to balance were explained and even elaborated on at length

when the plaintiff had further questions. This is evident from the detailed correspondence between the plaintiff and the defendants.

231 All in all, it is because of the defendants' detailed and comprehensive advice that the plaintiff was eventually able to make a "more informed decision on the way forward"[127] to proceed with the Whipple Surgery. I therefore hold that even if the defendants have to be assessed on the standard set out in *Montgomery*, I would not have found them to be negligent in the advice they had rendered to the plaintiff.

**Prof Ooi was not negligent in relation to his post-operative care**

232 As noted at [74], the NCCS did not owe a non-delegable duty of care to the plaintiff in relation to the Whipple Surgery and post-operative care. The plaintiff's central complaints in relation to post-operative care are that (i) he was not managed properly during his inpatient stay after the surgery; (ii) he was discharged on 27 August 2010 notwithstanding the fact that he had not fully recovered; and (iii) Prof Ooi did not appreciate the blood test results on 3 September 2012 during the plaintiff's outpatient review.

233 Prior to closure, two surgical drains, *viz*, the right surgical drain and the left surgical drain, were placed to allow post-operative secretions to drain externally, and to monitor for potential problems that might arise following the Whipple Surgery. After the Whipple Surgery, the plaintiff was managed as an inpatient during the post-operative period, *ie*, the period from 16 to 27 August 2010. The plaintiff stated that he experienced considerable pain during the first three PODs and that the surgical drains were continuously draining fluids. He

[127] Dr Tan's AEIC, p 26.

also stated that he suffered from nausea and vomiting prior to his discharge. The right surgical drain was removed by 27 August 2010, but when the plaintiff was discharged on the same day, the left surgical drain was still attached to him and was draining fluid.

234 I note that, in general, the leakage of enzyme-containing fluid from the pancreatic tissue or duct of any origin is regarded as a post-surgical situation known as a pancreatic fistula. As noted in a paper referred to by Prof Büchler, *viz*, Thilo Hackert *et al*, "Postoperative pancreatic fistula" (2011) 9 The Surgeon 211 ("the Hackert paper") at 212, "the existence of any fluid output *via* an intraoperatively or postoperatively inserted drain on or after postoperative day three with an amylase content greater than three times the upper normal serum value" indicated a post-operative pancreatic fistula. The Hackert paper stated at 214 that a pancreatic fistula, *inter alia*, can be managed by drainage alone. It was accepted by all experts that gave evidence on this point that the plaintiff probably had a pancreatic fistula pursuant to the definition of that condition as set out in the Hackert paper.

235 The plaintiff was prescribed a two-week course of antibiotics and scheduled for an early follow up appointment on 3 September 2010. As regards the outpatient review on 3 September 2010, it was argued that the plaintiff's haemoglobin level was slightly low. His serum amylase level and total white cell count were, however, in the normal range, suggesting that there was no pancreatitis (inflammation) or infection.

236 Prof Modlin stated the following in his expert report:[128]

[128] Prof Modlin's AEIC, p 212.

> The hospital chart indicates that in the postoperative phase there was clear evidence that [the plaintiff] was not recovering smoothly from his unnecessary Whipple procedure. Overall there was evidence of sepsis and demonstrable excessive fluid drainage from the catheters that had been left in place as well as abnormal pancreatic enzyme levels. When viewed as a matrix of clinical and biochemical information it should have been apparent that [the plaintiff] was suffering from anastomotic leakage. Thus in the postoperative period (date of surgery: 16.8.10) elevated temperature, elevated WCC, elevated amylase and lipase were noted as well as massive pancreatic drainage volume, bilious material and prolonged ileus. All of these are consistent with the diagnosis of anastomotic leakage and sepsis. …

237 During trial, Prof Modlin gave evidence that the temperature of the plaintiff was elevated "almost every single day" and that he was given a drug known as Paracetamol regularly to suppress his temperature artificially. Prof Modlin added that "the drainage [was increasing]" and yellow. In his view, "any prudent and reasonable physician would accept the fact that [there was] a potential complication in [the plaintiff's] abdomen". Prof Ooi therefore should have analysed whether there was an anastomotic leak.[129] By this, Prof Modlin meant that Prof Ooi should have asked for an abdominal CT scan with dye to be conducted to ascertain if there was an anastomotic leak.

238 In Prof Modlin's view, the increased drainage was acceptable only during the first two PODs. He cautioned that one ought to be anxious if there was a leak after PODs three and four.[130] However, the Hackert paper does not seem to support Prof Modlin's evidence. That paper was referred to by Prof Büchler. It appears to me from the Hackert paper that it is normal for the drains

[129] Transcript dated 8 May 2014, p 95.

[130] Transcript dated 8 May 2014, p 68.

to continue to leak (for up to two to four weeks) if the plaintiff has a pancreatic fistula.

239 Prof Büchler took a different view from Prof Modlin. In his view, though the left surgical drain of the plaintiff was still in place when he was discharged, there were no signs of inflammation. In his view, it was the usual international standard to discharge a patient with a controlled pancreatic fistula that has been sufficiently drained and therefore is not affecting the patient's health in terms of fever, pain or elevated white blood cells.[131] Therefore, he took the view that Prof Ooi's decision to discharge the plaintiff on 27 August 2010 was reasonable and appropriate. He also noted that there was no secretion from the left drain on 3 September 2010 during the outpatient consultation. Therefore, he said that there was no need for further investigation.

240 Prof Büchler also noted that unless there was blood or bile, the management of a pancreatic leak, *ie*, fistula, "would be wait and see". He said that 90 – 95% of pancreatic leaks have been controlled by a "wait and see policy".[132] Indeed, it is noted in the Hackert paper (at 214) that an uncomplicated fistula can be usually managed by drainage alone for two to four weeks, *ie*, the wait and see approach.

241 I note that Prof Büchler also addressed Prof Modlin's allegation that Prof Ooi had "suppressed" the temperature of the plaintiff artificially using Paracetamol. He contended that the temperatures "that count", *ie*, suggest infection or a complication, would be those above 38.5ºC which could not be

[131] Prof Büchler's AEIC, pp 34 – 35.

[132] Transcript dated 2 September 2015, p 54.

influenced by the administration of drugs.[133] He therefore suggested that there was no indication from the body temperature of the plaintiff that he might be suffering from an infection or inflammation; the plaintiff's temperature at the time of discharge was 37.7ºC.

242 Prof Madhavan's evidence was similar. He stated that although the plaintiff had mild intermittent fever and raised white blood cell count in the first few PODs, the white blood cell count had started to come down by the time the plaintiff was discharged. He also noted that the high amylase levels in the drain fluids was to be fully expected in light of the pancreatic fistula and should not have affected the decision to discharge the plaintiff. He also noted that the plaintiff had himself requested to go back to Malaysia. He stated that the reasons for delaying discharge of a patient should be fever, rising white blood cell count, positive blood cultures or blood in the drains. In this regard, he noted that a simple persistence of fluid leaking from the drain itself was no reason to delay the discharge of a patient.[134] Prof Madhavan also noted that the plaintiff's white blood cell count was normal after discharge and that suggested that there was no infection. Hence, there was no need for further investigation during the plaintiff's outpatient consultation on 3 September 2010.

243 Indeed, I note that Prof Madhavan's observation was poignant as the normal white blood cell count of the plaintiff by 3 September 2010 would have suggested that the plaintiff did not have infection. In fact, Prof Madhavan was also able to point out why Prof Modlin was incorrect in suggesting that the surgical drains attached to the plaintiff were secreting bile. He pointed out that

[133] Transcript dated 2 September 2015, p 55.

[134] Prof Madhavan's AEIC, pp 49 – 50.

the drainage of bile would not stop[135] if there was an anastomotic leak. He gave evidence that a yellowish discharge would progressively become green if there was a discharge of bile[136] from an anastomotic leak. Prof Madhavan's explanation made logical sense to me. However, in the case of the plaintiff, all the readings recorded by both the nurses in the ward and Prof Ooi suggested that the fluids discharged were serous, *ie*, clear,[137] by the time the plaintiff was discharged.

244 Apart from this, the observations generally also revealed that the plaintiff's condition had been improving. By POD four he had stopped vomiting, by POD nine he took feeds well and by POD ten, *ie*, 26 August 2010, he was eating very well and "very keen to go home"[138].

245 Assessing the evidence of the experts in the round and in light of the Hackert paper, I find that it was not unreasonable or improper for Prof Ooi to have discharged the plaintiff on 27 August 2010. I accept that it was appropriate and reasonable for Prof Ooi to "wait and see" and observe the plaintiff's draining of fluids from the surgical drains and his temperature. In the present case, by the time the plaintiff was discharged, the fluids draining from the left surgical drain were clear and the right surgical drain was removed as it had dried out. There was therefore no suspicion that the plaintiff was draining bile. The plaintiff's temperature was also not in the range which Prof Büchler highlighted as giving rise to concern. Most importantly, the plaintiff himself was able to communicate that he was well and had commenced eating by then. As noted by

[135] Transcipt dated 15 September 2015, p 91.

[136] Transcript dated 15 September 2015, pp 101 – 102.

[137] Exhibit 1D20.

[138] DCB 193 and Exhibit 1D20.

Prof Madhavan, there was no blood in the surgical drains and no sign of the white blood cell count of the plaintiff rising. The discharge of the plaintiff must also be viewed in the context where he had a follow-up outpatient appointment with Prof Ooi soon thereafter on 3 September 2010.

246 Additionally, I also find that there was no basis for suspecting that the plaintiff's condition needed any further investigation during the outpatient consultation on 3 September 2010. As noted by Prof Madhavan, the plaintiff's white blood cell count was in the normal range and hence there was no reason to suspect that he had an anastomotic leak, sepsis or inflammation. Additionally, by 3 September 2010, the plaintiff's left surgical drain had been dry for three days and he did not have a fever or any abdominal pain. Therefore it would appear that the plaintiff's pancreatic fistula had completely healed by that date as noted. It was also noted by Dr Büchler that there was no basis for suspecting that the plaintiff might be bleeding as his haemoglobin levels were "excellent". In fact, it was brought to my attention that the plaintiff was well enough to visit his lung surgeon, Dr Agasthian, to discuss the removal of the lung NET on 2 September 2010.

247 On the whole, I accept Prof Büchler's and Prof Madhavan's evidence which seem to me to be entirely logical and defensible. I find that Prof Ooi was not negligent in not conducting further investigations on 3 September 2010. While Prof Modlin was of the view that the plaintiff must have suffered the anastomotic leak sometime before 3 September 2010, I do not think that he was able to muster the objective clinical data to support his assertions. Almost all the objections he raised against Prof Ooi in his post-operative management of the plaintiff were countered point-by-point by Prof Büchler and Prof Madhavan, not only based on their experience and opinion but also on their ability to muster

the evidence (such as the normal white blood cell data, the absence of the relevant high temperature to indicate infection, the absence of a continuous bile discharge to indicate an anastomotic leak *etc*.) to convincingly support their opinion that Prof Ooi's post-operative care of the plaintiff was appropriate. This is, of course, apart from the fact that Prof Büchler and Prof Madhavan are practising surgeons while Prof Modlin has not performed surgeries for five years. While this factor is in no sense determinative, it went towards the weight that is ascribed to his view of the post-operative management of the plaintiff by Prof Ooi. Accordingly, I find that Prof Ooi had not been negligent in his post-operative care of the plaintiff.

**The plaintiff would not have changed his decision otherwise: causation**

248 The plaintiff contends, *inter alia*, that further tests, such as the EUS-FNA should have been performed on him before he decided to proceed with the Whipple Surgery. It is incumbent on the plaintiff to show, as a matter of causation, that (i) he would have taken up the option of EUS-FNA if it was put before him; and (ii) that the result of the EUS-FNA would have made him change his mind to not go for the Whipple Surgery. The plaintiff has not been able to establish either of these points.

249 As I have pointed out, the plaintiff was alive to the option of an EUS prior to the Whipple Surgery. When he discussed this with Dr Tan on email, Dr Tan recommended that EUS alone might not be conclusive, and the plaintiff could consider an EUS guided needle biopsy or an ERCP guided biopsy of the uncinate process if that option was technically feasible.[139] The plaintiff emailed Prof Ooi to ask about an EUS-FNA. Prof Ooi replied on the same day, and

[139] 6 AB 196.

explained that the results of an EUS-FNA would only be useful if the results were positive. A negative result would not lead to a conclusion that it was safe to leave the pancreatic lesions alone. In Prof Ooi's opinion, there was a slight risk with an EUS-FNA and in the plaintiff's situation it might not be beneficial. The plaintiff assimilated these points, and asked Dr Tan for his views. Dr Tan agreed that EUS-FNA would only be useful if there was a positive finding. As we know, no EUS-FNA was eventually performed on the plaintiff.

250 As will be seen, the first question of whether the plaintiff would have pursued an EUS-FNA, on the present facts, is intertwined with the second question of whether the EUS-FNA would have provided any useful diagnostic information. The plaintiff was only concerned at the material time with obtaining information that would enable him to decide whether or not to surgically resect the pancreatic lesions. On the facts, the plaintiff made the informed decision to not proceed with the EUS-FNA on the back of his discussions with Dr Tan and Prof Ooi. It is clear from the correspondence that the plaintiff understood the lack of positive diagnostic value of the EUS-FNA. I also find from the expert evidence that the EUS-FNA is not able to differentiate between PNETs and hyperplasia (see [125] above). In the circumstances, it is readily apparent that an EUS-FNA if performed would not have altered the plaintiff's decision to proceed with the Whipple Surgery.

251 The plaintiff also wanted "aggressive treatment". After having been well apprised of the difficulties and complications of the diagnoses in his case, the limitations of the diagnostic scans, the potential false positives and false negatives, the fact that the diagnosis of PNETs could never be conclusive given the diagnostic limitations, the presence of a differential diagnosis of hyperplasia and the risks relating to the major surgery, he decided to so proceed. He wanted

to take an aggressive approach to wholly eliminate any possible risk of the pancreatic lesions being PNETs and hence, he proceeded to have the Whipple Surgery, knowing full well that it was a major surgery. I must also highlight that this desire for "aggressive treatment" can be seen once again from the fact that on 2 September 2010,[140] after just having completed the Whipple Surgery, the plaintiff wasted no time in meeting his lung surgeon, Dr Agasthian, with the view towards removing the lung NET. It was Dr Tan who informed the plaintiff that he should focus on recovering from the Whipple Surgery first instead of pursuing his quest to rid himself of all potential health hazards from tumours.

**Conclusion**

252 In conclusion, I find that the defendants were not negligent in reaching their clinical diagnosis and differential diagnosis. In this regard, I establish from the entirety of the evidence of the defendants' experts, which is logical and supported by scientific literature, that the diagnoses were appropriate and reasonable, and the defendants had reached the diagnoses in a manner that a responsible body of medical men skilled in the relevant medical specialisations would have accepted as proper. Based on the diagnoses, it was entirely proper and acceptable for Prof Ooi to recommend surgery in relation to both the pancreatic lesions. After the positive palpation, it was also proper and reasonable for Prof Ooi to proceed with the resections of both the pancreatic lesions during the Whipple Surgery. He was not negligent in doing so as he had acted in accordance with a practice that a responsible body of HPB surgeons would have considered proper and acceptable.

[140] Transcript dated 26 August 2015, p 278.

253 The defendants were also not negligent in their advice to the plaintiff. In this regard, I find that the advice provided to the plaintiff was very thorough and I agree with the defendants' experts that the advice given was appropriate, reasonable and comprehensive. The defendants set out the alternatives available to the plaintiff and the material risks in relation to each alternative. The plaintiff was thus able to balance these risks prior to giving his informed consent to the Whipple Surgery (on both the approaches set out in *Khoo James v Gunapathy* and *Montgomery* respectively).

254 The NCCS did not owe a non-delegable duty to the plaintiff in relation to the Whipple Surgery or post-operative care of the plaintiff. Prof Ooi was not negligent in his post-operative care of the plaintiff. It is established from the defendants' expert opinions that the plaintiff was fit for discharge. There was no reason to suspect that the plaintiff might be suffering from anastomotic leak, sepsis or inflammation by the time the plaintiff was discharged and during the consultation on 3 September 2010.

255 The plaintiff elected to not proceed with the EUS-FNA after considering the diagnostic value of the test. In any event, an examination of the aspirate from an EUS-FNA would not have been able to distinguish between PNETs and hyperplasia to make a difference to the diagnoses, the advice and recommendations of the defendants.

256 In light of the above, I dismiss the plaintiff's claims *in toto*.

257 I will hear parties on costs if not agreed.

Chan Seng Onn
Judge

Palaniappan Sundararaj and Lim Min (Straits Law Practice LLC) for the plaintiff;
Edwin Tong *SC*, Mak Wei Munn, Tham Hsu Hsien, Christine Tee and Hoh Jian Yong (Allen & Gledhill LLP) for the first defendant;
Kuah Boon Theng, Felicia Chain, Gerald Soo and Karen Yong (Legal Clinic LLC) for the second defendant.

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