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HISTORY

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William James Lytle: a historical review

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William Lytle (1896–1986)

Anatomist, surgeon

William James Lytle (Fig. 1), MB (Bachelor of Medicine), FRCS (Fellow of the Royal College of Surgeons) was born on 27 September 1896 to Mary Moore and William Lytle Senior, farmers in Maghera, County Londonderry. He had two brothers and two sisters. He studied at Campbell College and then Queens University in Belfast, where in 1918, having won several prizes in anatomy, he graduated M.B., Ch.B. (Bachelor of Chirurgerie), B.A.O. (Bachelor of the Art of Obstetrics), with first-class honours. He had served as surgeon probationer and later sub-lieutenant in the Royal Naval Volunteer Reserve from 1915 [2].

After early appointments at the Children's Hospital in Liverpool and Ancoats Hospital in Manchester, he became a surgical registrar in Sheffield in 1923 and was appointed an honorary consultant in 1929.

He was known as 'Jimmy' by his friends. One of his surgical registrars in the 1950s, Mr. Michael Reece, refers to him as a ''shrewd and lovely man with a keen sense of humour''. He was a consultant surgeon then assistant professor, then postgraduate dean in Sheffield.

Mr. Lytle was a general surgeon in the finest tradition, taught anatomy and surgery to the nurses, undergraduates, and postgraduates and was much loved and respected for this and his sense of humour. A student in the 1920s remembers him emphasizing the need for diagrams in patients' notes and being a stickler for planning the required surgery.

He became a member of the Moynihan Chirurgical Club in 1942 and was president of both the Sheffield Medico-Chirurgical Society and Sheffield Medical Society. He was the first postgraduate medical dean of Sheffield University, a post he held for 10 years. He was a member of the Sheffield Ulster Society of which he became president in 1965. He strongly supported the Society's non-political and non-sectarian policies.

In 1940, he married Margery Wier, a pharmacist and daughter of a Sheffield general practitioner. They had two children, Elizabeth and John Lytle, who became an anaesthetist, and five grandchildren.

He did a great deal of work on the inguinal and femoral regions. He also described a groove in the posterior surface of the pancreas in which the common bile duct sinks out of sight, and where stones may be palpable if present [7].

His work on the posterior wall [1, 13, 4] of the inguinal canal describes a bilaminar structure of the fascia transversalis at the deep ring, which hitches the cord up laterally when the transversus muscle contracts. He divided it into a deeper transversalis fascia and a superficial 'transversus muscle fascia', which is thickened above the inguinal ligament as the iliopubic tract. He had developed numerous drawings and slides, including some by Mr. Kidd, to describe the anatomy of hernia.

Professor Lytle stated that the 'Genital branch which supplies the cremaster muscle and the skin of the groin and scrotum, accompanied by the cremaster artery and veins, enters the inguinal canal not through the deep ring but through the posterior wall 1 cm medial to the ring at the upper border of the iliopubic tract' [12].

He described the history of hernia repair and the importance of repair of the internal ring in 1945 and 1954 [5]. In 1970, he described the structure, development, function, and repair of the deep inguinal ring.

The descent of the testis was initially described by John Hunter. Hesselbach described the deep inguinal

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Fig. 1. William James Lytle

ring in 1816. Mr. Lytle studied the opening through which the testes leave the abdominal cavity by examining foetuses from the 5th month onwards [10]. His observations were as follows (the novel Lytle concept being the role of the pillars of the ring):

The first stage is the formation of the ring opening, and the second stage is the formation of the U-shaped ring. In the 1st month of foetal life, the testis appears as a swelling in the caudal end of the genital ridge and pushes its way into the body cavity by the 6th week. The gubernaculum appears as a short, thin stalk fixed to the lower pole of the testis and epididymis. It passes into and lies in the ventral wall of the foetus in the position of the future inguinal canal. The testicular blood supply from the aorta enters high up on the genital ridge and has a long intra-abdominal course. About the 8th week of foetal life, the processus vaginalis pushes outwards in front of and around the sides of the gubernaculum, where it is attached to the abdominal wall. It penetrates into the groin around the gubernaculum and frees the gubernaculums from the developing inguinal muscle layers, except for a posterior mesentery. The deep inguinal ring and later the inguinal canal are thus formed. About the 5th month of foetal life, a U-shaped thickening of the transversalis fascia begins to appear around the ring opening and is well developed at the 7th month. The now swollen gubernaculum enters the ring through the widely separated pillars. The testis now leaves the abdominal cavity, the ring narrows around the cord, and widely separated pillars of the ring come together. The processus vaginalis closes around birth. If obliteration of the upper part of the processus is delayed, it remains open throughout life. In adults with no history of a hernia, an open processus vaginalis was found, at post mortem, in 15 to 20 percent of cases.

A large number of hernias occur in the first 5 years of life due to patent processus vaginalis. The incidence drops in later childhood and increases in adolescent and adult life due to degeneration of the transversalis fascia. In the older age group indirect hernia is uncommon.

Mr. Lytle postulated that the main protection of the inguinal canal is a highly developed pressure valve at the deep ring, even in the presence of a patent processus [3]. The U-shaped ring, made of thickened transversalis fascia, is suspended by its pillars, medial and lateral, to the posterior aspect of the transversus abdominis muscle. The aponeurosis of the transversus muscle forms the floor of the ring and is supported in front by the internal oblique. This efficient valve closes when the intra-abdominal pressure is increased or when there is pressure on the valve, as in coughing, when any attempt at protrusion of the abdominal contents through the ring into a patent processus vaginalis pulls on the pillars of the ring. This exerts a tension on the already contracting transversus muscle, and the pillars of the ring are pulled upwards and outwards to close the ring more securely around the cord. With an obliterated processus, a lid of peritoneum covers the internal opening and gives added protection. Mr. Lytle had presented a film with the 'shutter mechanism' depicting the closure of this ring when the patient coughed or sneezed, closing around the spermatic cord. (Fig. 2).

This with the position and obliquity of the two rings plus the muscularity of the inguinal region

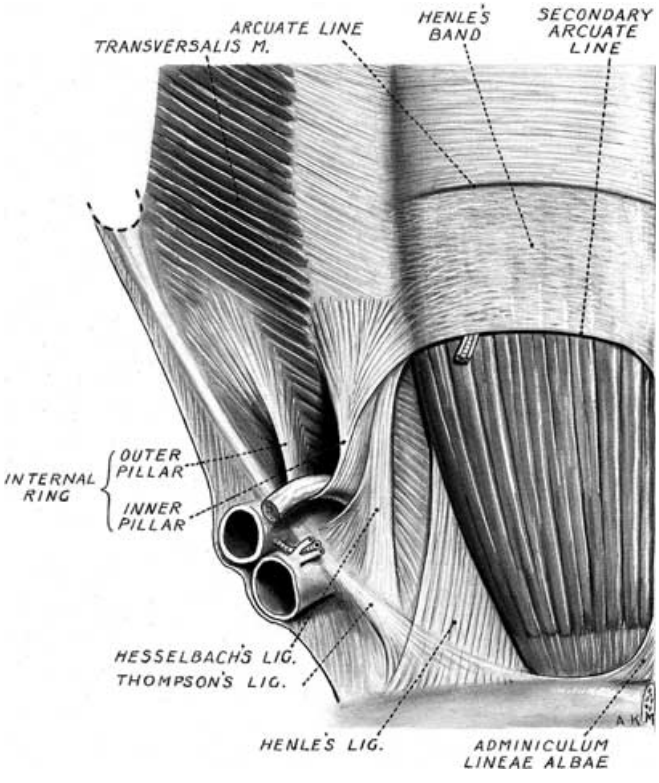

Fig. 2. Posterior view of a dissection of the lower part of the anterior abdominal wall, showing the anatomy of the internal ring

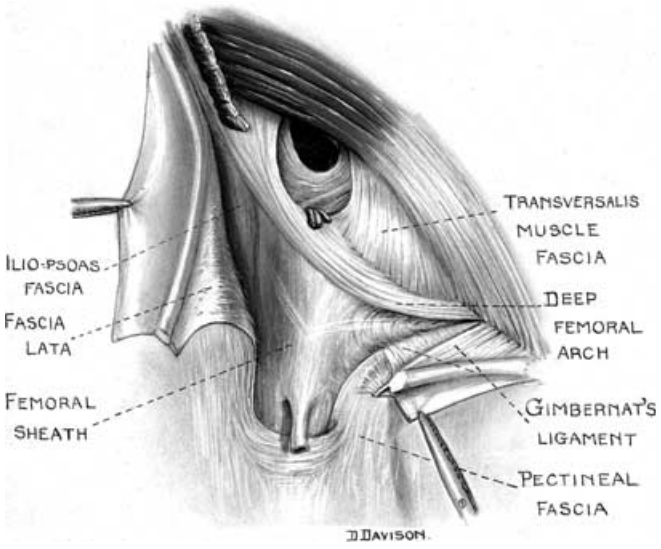

Fig. 3. Inguino-femoral region

Fig. 4. Photo of a cadaveric specimen of the saphenous opening showing the femoral hernia orifice

contributed to natural protection against a hernia [5] (Fig. 3).

Mr. Lytle also wrote extensively about the anatomy of the inguinal and lacunar ligaments in 1974 [11]. The inguinal ligament, previously known as the crural arch or Poupart's ligament, extends from the anterior superior iliac spine to its broad insertion into the pubic tubercle and along the pecten pubis [13, 11]. The ligament is the lower border of the external oblique aponeurosis folded back at right angles upon itself. It is set in the groin at 35° to 40° to the horizontal. Each fibre of the aponeurosis approaches the ligament at an angle varying from 10° to 20° and on entering the ligament turns medially to lie in its long axis. The external oblique aponeurosis is thickest and strongest in the lower abdomen, and this gives added strength to the ligament. The narrow lateral half of the ligament has an inferior surface fixed to the fascia lata of the thigh. The superior surface is free, and here the fascia iliaca posterior to the inguinal ligament gives attachment to the muscle fibres of the internal oblique and transversus muscles. The medial half of the ligament broadens to form the floor of the inguinal canal. A narrow grey band of fascia arising from the posterior border of the ligament disappears downwards as the fascia lata of the thigh, which covers and blends with the anterior wall of the femoral sheath. A layer of fascia, Scarpa's fascia, descends from the anterior abdominal wall over the inguinal ligament, to cover and blend with the fascia lata over the femoral sheath, giving the impression that the fascia lata is attached to the anterior border of the inguinal ligament. The fascia lata attached to the posterior border of the inguinal ligament changes direction backwards on its way to the pecten pubis to form the lacunar ligament. The transversalis fascia of the most

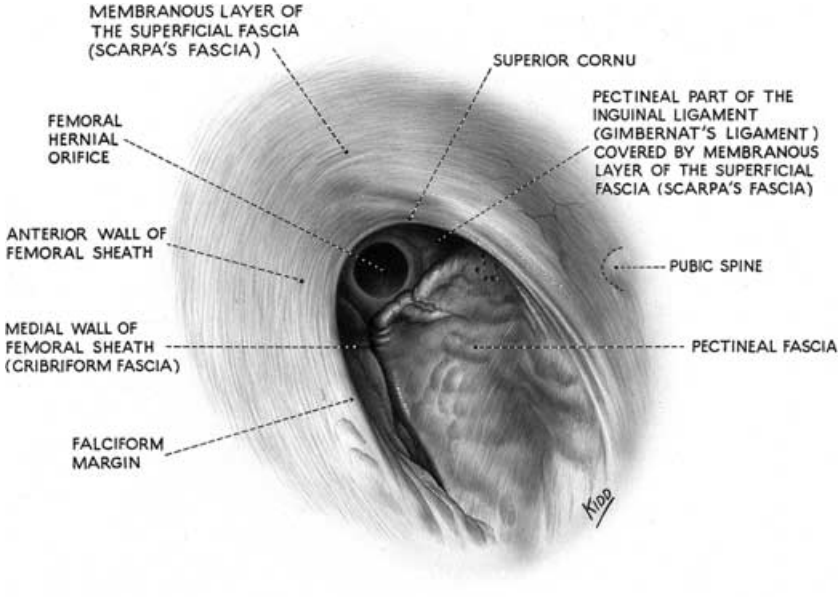

Fig. 5. Drawing of the anatomy of the femoral hernia site

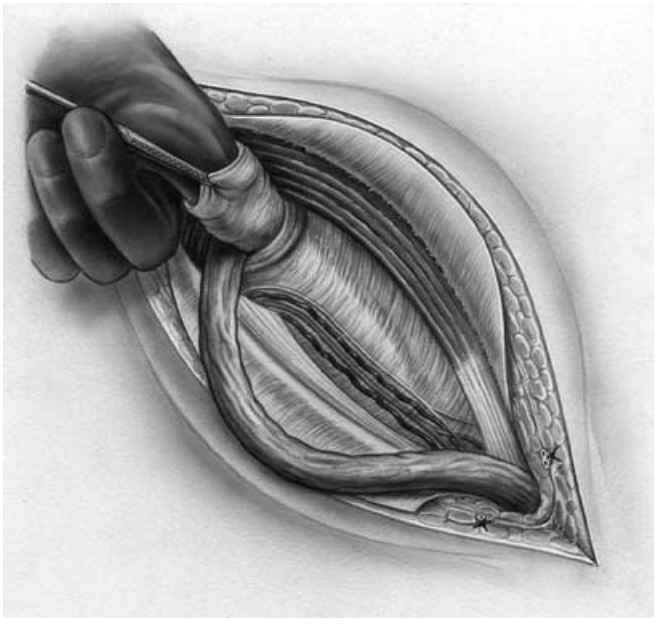

Fig. 6. Repair of inguinal hernia – reduction of sac contents

medial part of the posterior inguinal wall passes down to the posterior border of the inguinal ligament, turns back on its upper surface to the pecten pubis to form the femoral canal. The under surface of the inguinal ligament is fixed to the pectineus fascia before attaching to the pubic tubercle. Between this and the femoral sheath the under surface of the ligament is free and overhangs a hollow about 1 cm in depth known as the fossa ovalis. This hollow is formed because the fascia lata disappears into the depths of the groin to form the lacunar ligament. The fossa ovalis is filled with fat and lymph nodes, and a femoral hernia presents into it from behind the inguinal ligament. [13, 6, 9]. (Fig. 4, Fig. 5).

The lacunar ligament [13, 11] lies behind the inguinal ligament and in front of the pecten pubis. The ligament lies in two different planes. The anterior part, fixed to the posterior border of the inguinal ligament, passes back in the same horizontal plane as the inguinal ligament until it reaches and blends with the pectineus fascia along a line in front of and below the pecten. From this line the posterior part of the lacunar ligament, passes upwards and backwards to reach the pectineal ligament on the pecten pubis. The curved edge is lowered to lie in the same plane as the inguinal ligament. The curve fits closely around the medial border of the femoral sheath. The curved edge lies 3 cm lateral to the pubic tubercle. Mr. Lytle contradicted Gimbernat's teaching in the description of the site of the femoral hernia and description of the femoral ring.

The femoral canal is a funnel-shaped cavity [13, 9], the lower end of which ends blindly at the inguinal ligament. When a femoral hernia is present, a new opening breaches the normal blind end. Mr. Lytle termed this the femoral hernial orifice. Thus, there are two openings in a femoral hernia – the normal femoral ring and the femoral hernial orifice below. The

Fig. 7. Narrowing the internal ring

Fig. 8. Further narrowing of the internal ring

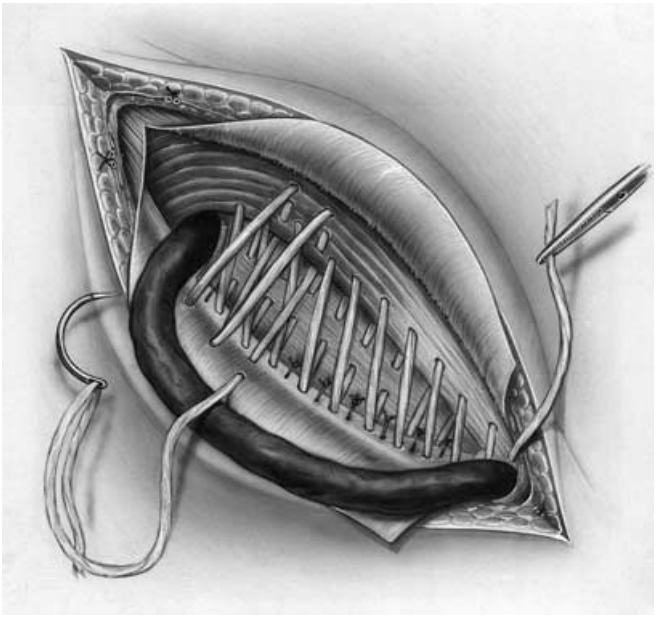

Fig. 10. Darn repair

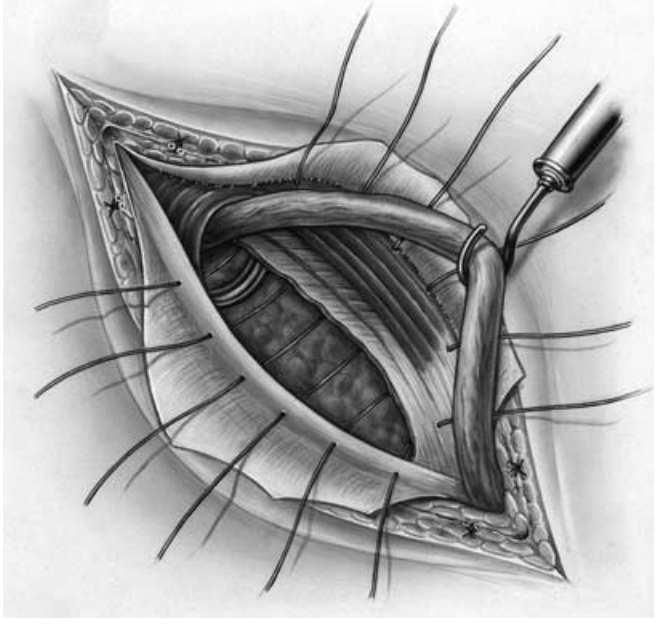

Fig. 9. Bassini's repair

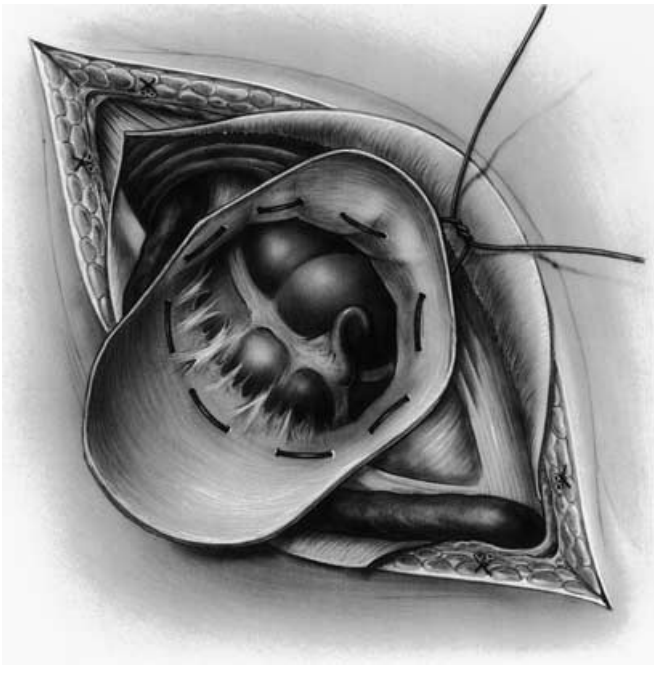

Fig. 11. Closure of the sac of a sliding hernia

femoral hernial orifice (Fig. 5) is the ring around the neck of the sac and causes strangulation. It presents when one carries out a low approach for a femoral hernia. [9, 8].

In 1978, he again wrote a descriptive account of the inguinal ligament, lacunar ligament, and parts of fascia of the thigh with photographs of operative and cadaveric specimens. He based his instructions on hernia repair based on his extensive understanding of the anatomy of the inguinal region. (Fig. 6, Fig. 7, Fig. 8, Fig. 9, Fig. 10, Fig. 11).

He continued to write on his favourite topic after retirement and remained a keen amateur historian and lover of English literature, Gothic architecture, European painting, and natural history.

William Lytle suffered a stroke and passed away in Sheffield on 27 June 1986.

Acknowledgements W.J. Lytle's son, Dr. John Lytle, provided archival material and permission for publication of drawings and pictures.

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