Cardiff University

School of Dentistry

FINAL BDS CLINICAL EXAMINATION 2022-23

PART C: CLINICAL CASE REPORTS

C1800135

Case Report 2

Abstract

Patient Number: A655436

Relevant Patient Information: Female, aged 55

History and Examination:

This patient presented with the complaint of generalised pain, an uncomfortable denture and a discoloured anterior tooth. The patient's medical history consisted of numerous co-morbidities including but not limited to, type 2 diabetes mellitus, gastro-oesophageal reflux disorder (GORD), depression, asthma and fibromyalgia. The intra-oral examination revealed 'sticky margins' on the anterior crown and veneer, an unretentive and unstable upper denture and poor oral hygiene.

Special Investigations:

Several of the patient's teeth were tender to percussion – full mouth periapical were taken to assess the state of the dentition. The radiographs revealed unrestorable carious lesions, periapical pathology and generalised periodontitis.

Treatment:

It was decided that extractions followed by simple periodontal treatment, a restoration, the fabrication of upper and lower acrylic partial dentures and replacement of the patient's indirect restorations, would restore health and improve the patient's smile.

History and Examination

Presenting Complaint: Chronic pain across the dentition; pain upon mastication associated with the lower left and lower right quadrants. Current denture is uncomfortable. Patient is unhappy with the appearance of UR1 which is discoloured, 'aches' and 'feels flimsy'.

History of Presenting Complaint: The patient has experienced pain across the dentition for years; the pain is mostly localised to the lower right side. The pain is constant but intermittently gets worse. The pain occasionally radiates to the ear and is sometimes associated with a headache. The pain is exacerbated by mastication and cold foodstuffs and is slightly relieved by Bonjela. The pain ranges from 6-10 on a scale of 1-10.

Medical History:

Medical Condition	Medication & Relevant Medical History
Hypothyroidism	Levothyroxine 100mg
Gastro-oesophageal reflux disorder (GORD)	Lansoprazole 60mg
Osteoporosis	
Hypertension	Ramipril 5mg
Depression	Duloxetine 60mg
Asthma	Salbutamol Inhaler 100mg Budesonide/Formoterol Inhaler 200µg/6µg Montelukast 10mg
Fibromyalgia	Gabapentin 300mg Pregabalin 50mg Co-Codamol 240mg
Type 2 Diabetes Mellitus	Metformin Hydrochloride 500mg

Other: Allergy to plaster following disectomy.

Dental History:

- Brushes with an electric toothbrush twice daily using a fluoride-containing toothpaste.
- The patient uses chlorhexidine mouthwash and interdental sticks.
- The patient had UR6 extracted on Exam and Emergency 6 weeks ago.
- No GDP – last visited a dentist 6 years ago (no dental anxiety).
- The patient's expectations of treatment include alleviation of dental pain.

Social History:

- Works in a care home – no barriers to attendance.
- Non-smoker, consumes alcohol at weddings and Christmas, no recreational drug use.

Extra-Oral Examination:

- Tenderness upon palpation of the right masseter and right submandibular lymph nodes.
- Nothing abnormal detected (NAD) – temporomandibular joint (TMJ); remaining muscles of mastication; remaining lymph nodes (submental, cervical and pre-auricular).

Intra-Oral Examination:

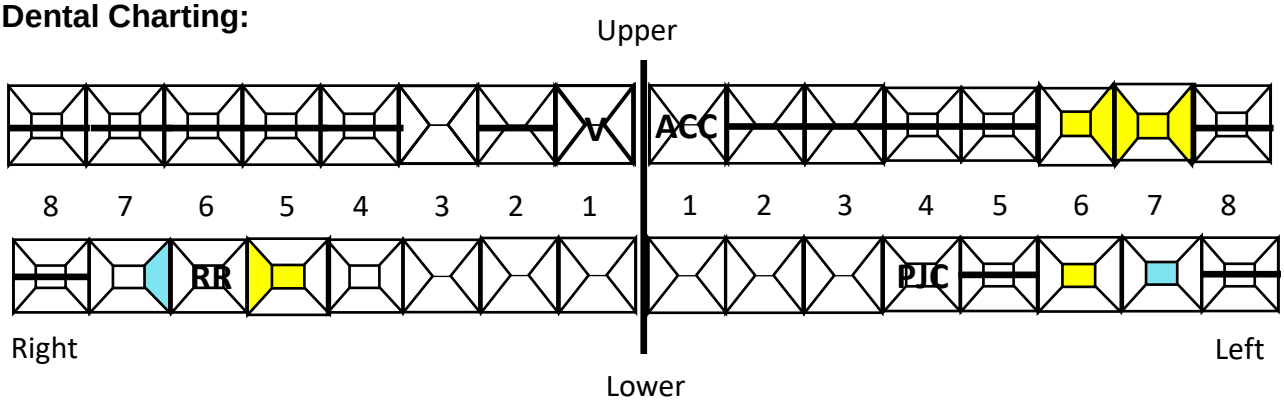
Soft Tissues

- Oedema and erythema of the gingivae in the lower right quadrant.
- NAD – patient's lips, buccal and labial sulci; dorsal, ventral and lateral borders of the tongue; hard and soft palate; floor of the mouth, oropharynx.

Hard Tissues

- Unsatisfactory oral hygiene (OH) – generalised plaque present.
- LR7 – mesial caries.
- LL7 – large occlusal cavity, unrestorable.
- 'Sticky margins' of UL1 crown and UR1 veneer; UR1 caries shadow.
- Upper acrylic partial denture – poorly fitting, unretentive, unstable, UL6 clasp non-engaging

Dental Charting:



Key:

	Tooth-coloured Restoration	**V**	Veneer
	Caries	**PJC**	Porcelain Jacket Crown
RR	Retained Root	**ACC**	All Ceramic Crown

Basic Periodontal Exam (BPE):

X	**1**	**1**
1	**1**	**1**

Special Tests and Investigations:

Special Tests:

- Assessment of Mobility (Miller Classification of Mobility) – LR5 is grade 1 mobile.
- Percussion Test – UL7, LR5, LR6, LR8 are tender to percussion.

Investigation: Full Mouth Intra-Oral Periapicals (IOPAs)

Justification: To assess UL7, LR5, LR6 & LR8 for periapical pathology; the extent & depth of caries affecting LR7 and LL7; UR1 & UL1 for periapical pathology and potential caries associated with sealants and restorations (CARS). (FGDP 2018)

1 

2 

3 

	Grade	Bone Levels	Bone Loss	Pathology
1	Acceptable	70%	Horizontal	None (cervical burnout distally)
2	Acceptable	95%	Horizontal	None
3	Acceptable	90%	Horizontal	UR6: distal CARS (into the pulp)

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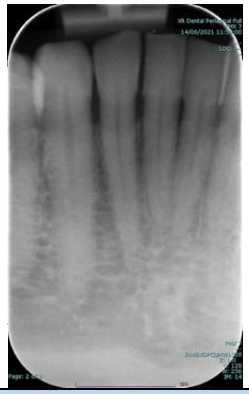
6 

	Grade	Bone Levels	Bone Loss	Pathology	Other
4	Acceptable	80%	Horizontal	LR7: mesial caries (D2)	LR6: retained root
5	Acceptable	90%	Horizontal	LR7: mesial caries (D2)	LR6: retained root LR3 supragingival calculus
6	Acceptable	90%	Horizontal	None	LR1: supragingival calculus

7 

8 

9 

	Grade	Bone Levels	Bone Loss	Pathology	Other

7	Acceptable	90%	Horizontal	None	LR1, LL1, LL2: supragingival calculus
8	Acceptable	90%	Horizontal	None	LL1, LL2, LL3: supragingival calculus
9	Acceptable	90%	Vertical	LL7: disto-occlusal caries (into the pulp)	LL5 - acceptable root filling (within 2mm of the radiographic apex)

Diagnosis:

- LL7 – Pulp Necrosis & Symptomatic Apical Periodontitis; Disto-Occlusal Caries, Extensive, Active
- LR7 – Mesial Caries, Moderate, Active
- UL6 – Distal Caries, Extensive, Active
- UR1 – Labial Caries, Moderate, Active (CARS) – evident clinically
- UL1 – Labial Caries, Moderate, Active (CARS) – evident clinically
- Generalised Periodontist Stage 1, Grade A, Currently in Remission, Risks: Poor Oral Hygiene (OH), Type 2 Diabetes Mellitus (DM).

Risk Assessment:

	Risk (High, Moderate, Low)	Justification
Caries	High	Multiple active carious lesions
Periodontitis	Moderate	Mild bone loss, type 2 DM, poor OH
Tooth Surface Loss	Moderate	Suffers with GORD and bruxism, defect <1/3 clinical crown height
Soft Tissue	Low	Non-smoker, low alcohol intake
Endodontic	High	Symptomatic lesion

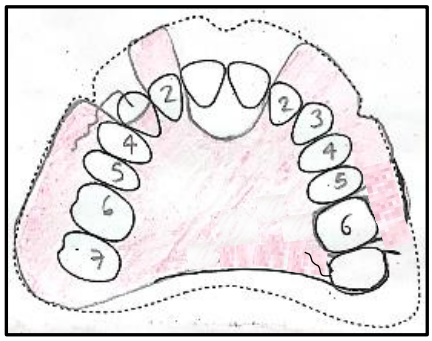
Treatment Plan:

- Stabilisation – Extraction under local anaesthetic (XLA) of LL7, LR6, UL6.
- Phase 1
    I. Oral hygiene education (OHE), plaque & bleeding indices, dietary advice, Sodium Fluoride Toothpaste, 0.619% (2800ppm) prescription.
    II. Professional Mechanical Plaque Removal (PMPR).
    III. Restore LR7.
    IV. Restore UR1 and UL1 caries.
  - Phase 2
    I. Upper (P/-) and lower (/-P) acrylic removable acrylic dentures.
    II. Replacement of porcelain veneer on UR1 & all ceramic crown (ACC) on UL1.
  - Phase 3 – Recall of 3 months.

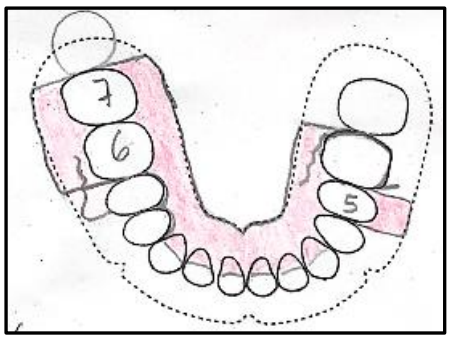
Denture Design

***Mucosa-Borne Design**:* The decision was made to fabricate mucosa-borne dentures instead of Cobalt Chrome (CoCr) dentures due to the wait time of the patient's oral surgery referral. As it was unknown when LL7, LR6 and UL6 would be extracted, the RPDs were considered 'transitional-type' dentures. Acrylic RPDs were favoured due to their ease of modification – thus if the patient were to have LL7, LR6 and UL6 extracted post-denture insertion, the selected teeth could be added onto the existing dentures relatively simply. *NB. As the teeth were extracted prior to the wax-try ins, they were added onto the denture design – the dentures were inserted soon after XLA of the teeth so they can be considered as 'immediate-type' dentures.*

Upper: A stainless steel i-bar was placed on UR3 to provide direct retention; reciprocation was achieved by colleting UR3. Likewise, a distally approaching stainless steel C-clasp was placed on UL7 to provide direct retention; reciprocation was achieved by colleting UL7. The denture base provided stability.



Lower: A stainless steel i-bar was placed on LR5 to provide direct retention; reciprocation was achieved by colleting LR5. A mesially approaching stainless steel C-clasp was placed on LL6 to provide direct retention; reciprocation was achieved by colleting LL6. The remaining mandibular teeth were colleted, proving indirect retention. The denture base provided stability. Due to the large edentulous span between LR5 and LR7, two denture teeth were used to fill the space, a 6 and 7.



Treatment:

- XLA of LL7, LR6 and UL6 – **Completed by the Oral Surgery department.**
- Oral Hygiene Education (OHE), plaque & bleeding indices (plaque score = 44%, bleeding score = 66%), dietary advice – **Completed.**
- PMPR – **Completed**.
- Restoration of LR7 – **Completed**.
- Fabrication of upper and lower acrylic RPDs – **Completed.**
- Replacement of ACC on UL1 – **Preparation completed, crown to be cemented** *(NB. The patient's original ACC crown fractured at an earlier date therefore a temporary crown was made using 'Integrity' and cemented on with 'Temp-bond'.)*
- Replacement of veneer on UR1 – **Preparation completed, veneer to be cemented.**
- Recall – **Yet to be completed.**

Discussion

Rationale for Treatment:

Periodontal Treatment: As outlined in the BSP (2016) guidance, a plaque score, bleeding score and OHE were carried out due to the BPE scores of 1 to establish a baseline, assess gingival inflammation and improve the patient's OH, respectively. Likewise, a PMPR was carried out to remove the supragingival calculus on the lower anterior teeth.

Fabrication of Acrylic P/P: The decision was made to fabricate a new upper RPD as the patient's current denture was unretentive, unstable and causing discomfort. The patient also desired for their lower edentulous spaces filled therefore a lower RPD was fabricated.

XLA of LL7: According to British Endodontic Society (2022), a definitive restoration must be placed on a tooth post-root canal treatment to provide a good coronal seal. As LL7 did not have 2mm of circumferential dentine to provide a ferrule effect, it was deemed unrestorable. XLA of LL7 was therefore the only option to treat the symptomatic apical periodontist and alleviate pain.

XLA of UL6 & LR6: UL6 was deemed unrestorable; LR6 was extracted to alleviate pain.

Sodium Fluoride (NaF) Toothpaste, 0.619% (2800ppm): According to SDCEP (2016), Sodium Fluoride Toothpaste, 0.619% should be prescribed for patients aged over 10 with a high caries risk and modifiable risk factors. *NB. Although the NaF toothpaste was treatment planned, I mistakenly forgot write-up the prescription thus the patient did not receive the toothpaste.*

Replacement of ACC and Veneer: Poor restoration margins, CARS (*NB. No CARS was evident on UR1/UL1 upon removal of the restorations; cause of the 'caries-like' shadow is ambiguous).*

Recall: 3 months – the patient has a high risk of caries & endodontic infection; a short recall is key to assess whether the patient is maintaining good denture hygiene (NICE 2004).

Lithium Disilicate versus Zirconia for Anterior Indirect Restorations: Lithium disilicate is a monolithic glass ceramic which is favoured for anterior indirect restorations due to its brilliant optical characteristics. With the most translucent zirconia merely 73% the translucency of a standard lithium disilicate, lithium disilicate restorations appear significantly more 'tooth-like' than zirconia when cemented on with a clear-coloured luting agent (Succaria and Morgano 2011). Zirconia, however, has a higher flexural strength than lithium disilicate (1000mPA compared to 400mPA) (Succaria and Morgano 2011) and is superior at chromatic masking (Zarone et al. 2019). While lithium disilicate was chosen as the material for both the ACC and veneer, zirconia may have been better able to mask the discoloured UR1 – a study by Irvani et al. (2020) demonstrated that a low translucency ceramic with a thickness of 0.5-0.7mm sufficiently masks a shade a A4 tooth to A2. For the ACC nonetheless, lithium disilicate was the clearly the superior choice of material as the mechanical properties of zirconia do not outweigh

the advantageous aesthetics of lithium disilicate – this is especially true as anterior teeth experience low occlusal loads which lithium disilicate is adequately able to withstand.

Implications of the Patient's Medical History on their Oral Health Status:

Asthma and GORD: Asthma is a chronic respiratory disease with numerous implications for oral health. Patients with asthma are often on two types of inhalers – a short-acting beta-2 agonist used as required, to relieve symptoms and an inhaled corticosteroid used daily to reduce airway inflammation (Godara et al. 2011). Unfortunately, corticosteroid inhalers supress immune functions and increase the risk of oral candidiasis – a study by Fukushima et al. (2003) cultured fungi from the retropharyngeal areas of healthy patients and those on inhaled corticosteroids; the results showed considerably more Candida present in those using inhaled corticosteroids. Moreover, chronic use of beta-2 agonists reduces overall saliva production by 26% (Godara et al. 2011) – this decreases the buffering capacity and antimicrobial protection of saliva (Gani et al. 2020), increasing the risk of caries and erosion. The pH of the oral environment also drops below the critical pH 30 minutes post-inhaler use, exacerbating these risks (Godara et al. 2011). Crucially, and in the case of the patient being discussed, the American Lung Association Asthma Clinical Research Centres Network estimates that 38% of asthmatic patients also suffer with GORD. With the pH of endogenous acid at approximately 1.2, GORD results in swift dissolution of the tooth surface. In asthmatic patients, the compromised buffering capacity of saliva coupled with the low pH of the endogenous acid results in a high risk of dental erosion (Mastronarde 2012). Evidently, asthma and GORD has likely played a role in the development of the patient's carious lesions. While the patient's GORD is controlled by lansoprazole, resulting in a level of tooth-wear acceptable for her age, the patient's chronic use of inhalers will continue to increase her risk of caries, erosion and oral candidiasis, namely denture stomatitis.

Fibromyalgia and Depression: Fibromyalgia is a chronic pain syndrome characterised by generalised musculoskeletal pain. Unfortunately, those with fibromyalgia are three times more likely to suffer with a psychiatric disorder (Jeon 2020). It has been estimated that only 40% of those with a mental health disorder regularly attend the dentist (Stepović et al. 2020) – a study by Park et al. (2014) demonstrated that, amongst nearly 1000 adults with depression, 45.1% chose not to seek dental treatment despite suffering with a dental problem. Depression is a psychological barrier to oral health as it often results in a lack of motivation to carry out simple tasks such attending the dentist or carrying out OH practises (Skośkiewicz-Malinowska et al. 2018) – Stepović et al. (2020) divulged that those with depression have 25% more carious teeth than those without depression. In the case of the patient being discussed, it is likely that lack of motivation to firstly, carry out regular OH practises and secondly, seek immediate help for her dental issues, were contributing factors to the development of oral pathology and onset of pain.

Reflection

Accuracy of the BPE: The BPE revealed scores of 1 in all sextants apart from the upper right (UR). The IOPAs of the lower anterior teeth showed supragingival calculus; this should have been identified during the BPE, giving this sextant a score of 2. Similarly, BSP (2016) states that a sextant qualifies for its own score if at least two teeth are present – the UR sextant should thus have been given its own score. Unfortunately, these discrepancies occurred due to lack of experience; as this was my first instance conducting a BPE on a patient, I was especially cautious with the probe due to my concern of causing discomfort. As calculus can be picked up by tactile sensation, inadequate force on the probe resulted in an oversight. For all BPEs since, I have used the probe with the recommended 25g of force to ensure the correct scores are given and given a sextant its own score if two or more teeth are present (SDCEP 2014).

Periodontal Diagnosis: When I initially diagnosed periodontist, I mistakenly took the worst site of bone loss from an extraction site and over-estimated this bone loss giving a grade C rate of progression. I also incorrectly diagnosed a stage of 2 which, considering the patient's age, is not plausible with grade C rate of progression. These errors occurred due to lack of experience; owing to greater knowledge, I am now aware that interproximal bone loss should in fact have been utilised, giving a Stage 1, Grade A diagnosis and a moderate risk of periodontitis.

Appropriateness of Immediate-Type Dentures: The patient will have undoubtedly experienced rapid bone resorption post-XLA. Since the dentures were inserted soon after the XLAs, they are likely to become unretentive and unstable; a hard permanent lab or chairside reline followed by remake of the dentures is therefore to be expected. By providing the patient with immediate-type dentures, I was able to improve their aesthetics and function, thereby improving their quality of life. In addition, it will have allowed the patient's oral musculature to adapt to the lower denture, making the definitive denture easier to get accustomed to. Having to potentially reline and certainly remake the dentures however, drastically increases the treatment time which may become inconvenient and tiresome for the patient. Upon reflection, I believe that the advantages of providing immediate-type dentures outweigh the disadvantages, however for a patient less motivated to attend appointments or less concerned about aesthetics, providing definitive dentures 6 months post-XLA may be more appropriate.

Improving Patient Motivation: When the patient first presented, she appeared despondent about her oral health as she stated that she 'does not smile'. I was able to greatly improve the patient's motivation by using 'TIPPS' as recommended by the SDCEP (2014) guidance – significantly less plaque was visible in the appointment post-OHE and thereafter, due to reinforcement of OHE and commendation of the patient's efforts. With the patient's treatment near complete, is it evident that she is in greater spirits with regards to her oral health, namely due to the absence of pain and an improved smile which has uplifted her confidence.

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