DF1 Case Studies

Surgical Case

Michael Hicks

North Western Deanery
Background
Miss M attended as a new patient requiring treatment. She was a nervous patient and required basic periodontal therapy, an extraction, routine restorations, a crown, and bridgework. The extraction proved difficult and required a surgical approach.

History

Reason for Attendance
- New patient examination

Presenting Complaints
1. Lost a crown on an upper left tooth (UL5) a couple of years ago and wonders if it can be restored. It is not causing any pain or sensitivity, but is causing a bad taste in her mouth.
2. Very anxious about coming to the dentist which is why she has waited a long time to have her teeth looked at.

Medical History
- Miss M suffers with depression and is currently taking Prozac

Dental History
- Brushes with a manual brush and fluoride ‘sensitive’ toothpaste
- Not seen a dentist for 4 years

Social History
- Smoking: Recently quit smoking (Previously smoked for 25 years, 10 cigarettes a day)
- Alcohol: Occasional alcohol consumption
- Stress: Reasonably stressed at the moment with difficulties at work

Family History
- No history of hereditary conditions (e.g. cancer, periodontal disease, etc.)

Examination

Extra-Oral
- Lymph Nodes: NAD
- TMJ: Single unilateral click LHS on late opening. No pain or jaw problems at the moment.
- Asymmetry: NAD
Intra-Oral

- Lips: NAD
- Labial Mucosa: NAD
- Buccal Mucosa: NAD
- Hard Palate: NAD
- Soft Palate: NAD
- Oropharynx: NAD
- Tongue: NAD
- Floor of Mouth: NAD
- Gingivae: Marginal gingivitis

Oral Hygiene

- Oral hygiene is fair
- Plaque and calculus present
- Patient brushes twice daily with sensitive toothpaste using a manual brush

Charting

Basic Periodontal Examination

<table>
<thead>
<tr>
<th>8</th>
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- Plaque retention factors: Cavities and calculus
Special Tests

Radiographs

**Initial Bitewing Radiographs**

<table>
<thead>
<tr>
<th><strong>Types of Radiograph:</strong></th>
<th>Right and Left Bitewings for Interproximal caries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Periodontal Bone Levels:</strong></td>
<td>10% generalised horizontal bone loss</td>
</tr>
<tr>
<td></td>
<td>More bone loss around UL7 and UL8 in the region of 25%</td>
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<tr>
<td></td>
<td>Vertical bone loss LL7 mesial</td>
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<tr>
<td><strong>Calculus:</strong></td>
<td>UL7 distal</td>
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<tr>
<td><strong>Caries:</strong></td>
<td>UR6 distal D2</td>
</tr>
<tr>
<td><strong>Restoration Deficiencies/Ledges:</strong></td>
<td>LR7 mesial negative ledge - monitor</td>
</tr>
<tr>
<td><strong>Pathology:</strong></td>
<td>Nil</td>
</tr>
<tr>
<td><strong>Unerupted teeth/Retained Roots:</strong></td>
<td>UL5 retained root</td>
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<tr>
<td><strong>Other:</strong></td>
<td>UR6, UL6, LL4 and LR5 are root filled. UL6 obturation appears inadequate in mesial roots but no symptoms at the moment. Right BW - Grade 2 quality; due to coning and roller marks Left BW - Grade 1 quality</td>
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</tbody>
</table>

**Pre-Operative Periapical Radiograph UL5**

<table>
<thead>
<tr>
<th><strong>Type of Radiograph:</strong></th>
<th>PA radiograph taken preoperatively to assess UL5 retained root for extraction</th>
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</thead>
<tbody>
<tr>
<td><strong>Periodontal Bone Levels:</strong></td>
<td>10% generalised horizontal bone loss</td>
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<tr>
<td></td>
<td>More bone loss around UL7 and UL8 in the region of 25%</td>
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<tr>
<td><strong>Calculus:</strong></td>
<td>UL7 distal</td>
</tr>
<tr>
<td><strong>Caries:</strong></td>
<td>UL3 distal D1, UL4 mesial D1</td>
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<tr>
<td><strong>Restoration Deficiencies/Ledges:</strong></td>
<td>Nil</td>
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<td><strong>Pathology:</strong></td>
<td>Widening of the PDL space UL5</td>
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<td>? PA radiolucency and loss of lamina dura above UL6 mesial root.</td>
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<td>Causing no symptoms at present.</td>
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<td><strong>Unerupted teeth/Retained Roots:</strong></td>
<td>UL5 retained root</td>
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<tr>
<td><strong>Other:</strong></td>
<td>Grade 1 quality</td>
</tr>
<tr>
<td><strong>Pre-operative Periapical Radiograph UR6</strong></td>
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<tr>
<td><strong>Type of Radiograph:</strong></td>
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<tr>
<td>PA radiograph to check apical status UR6 prior to preparation for a crown</td>
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<td>UR6 distal D2</td>
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<td><strong>Restoration Deficiencies/Ledges:</strong></td>
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**Diagnoses**

1. Chronic generalised marginal gingivitis
2. Caries UR7 distal (not visible radiographically but visible clinically), UR6 distal, UL3 distal, UL4 mesial, UL7 mesial (not visible radiographically but ditching and minimal caries noted clinically)
3. Retained carious root UL5
4. Mild lower anterior toothwear which appears to be caused attrition and abrasion from the upper ceramic crowns

**Treatment Plan**

**Emergency Treatment**
- Patient was in no pain so no emergency treatment was required

**Stabilisation Phase**
- Oral Hygiene Instruction
- Fluoride varnish application
- Supra and subgingival scale and polish
- Diet Advice
- Extract UL5 and provide upper immediate denture during healing as UL5 is in the smile line

**Restorative Phase**
- Restore UR7, UR6, UL3, UL4, and UL7
- Replace UL5 with prosthesis once healing has occurred

**Maintenance**
- 6 monthly recall appointments and regular scaling to prevent periodontal disease

**Amendments to Treatment Plan**

- **Surgical Extraction UL5**
  Unfortunately, during extraction of the UL5, the coronal portion of the root fractured. Despite use of luxators and root forceps, I was unable to remove retained portion of the root through conventional extraction methods. I explained to the patient the requirement for a surgical extraction which was performed at the subsequent appointment.

- **Metallo-Ceramic Crown UR6**
  Before I was able to restore the UR6, it fractured when the patient was eating. The incident involved loss of the MOD restoration and part of the distobuccal cusp. I explained to the patient the amount of tooth remaining is weakened and discussed the options with the patient. At the moment the tooth is none functional but the pt would like it restoring if possible as she may have an implant in the future to replace the LR6. I explained that a composite core build-up would be required and a metallo-ceramic crown fitted to protect remaining tooth structure.
Aspects of Treatment

Surgical Extraction

- I discussed the surgical extraction with the practice principal who has much experience in minor oral surgery. He gave me advice on different methods of surgically extracting the root as detailed below.

1. Traditional transalveolar approach
   - Gain access through a 2 or 3 sided mucoperiosteal flap
     Buccal bone removed in a transalveolar method until the root is found
     Elevation of the root
   - Advantages:
     i. Less technique sensitive
     ii. Easier access
     iii. Quicker procedure
   - Disadvantages:
     i. More bone removal leads to a poor aesthetic outcome
     ii. Risk of pushing the root into the sinus when elevating
     iii. More bone removal means more post operative pain and swelling

2. Apicetomy type approach
   - 3 sided mucoperiosteal flap
     Apical bone removal
     Root delivered occlusally rather than apical force
   - Advantages:
     i. Preservation of buccal bone which allows a better aesthetic outcome and conserves more bone for a prosthesis in the future (i.e. implant)
     ii. Root is delivered occlusally which means a reduced likelihood of pushing a root into the maxillary sinus
     iii. Less bone removal required leading to less post operative pain
   - Disadvantages:
     i. More technically demanding
     ii. Longer procedure

- I decided to remove the root using the second method and the technique is illustrated overleaf.
1. Crestal, mesial relieving, and distal relieving incisions made for a 3-sided flap

2. Flap is raised with a Mitchell’s trimmer and Howarth’s periosteal elevator. A circular window of bone is removed at the approximate apex of the root with a slow speed surgical bur under irrigation.

3. The apex of the root is visualised and a small notch created on the root with the surgical handpiece. This will provide an application point for the Cryer’s elevators.

4. A Cryer’s elevator is applied to the application point and twisted to encourage the root to travel through the socket, occlusally.

5. The socket is debrided, and the flap is closed with simple interrupted sutures.
Pre-Operative Views of ULS extraction site

A 3 sided flap was raised and an apicotomy type approach used (a) to expose the root fragment (b). The root fragment was dislodged occlusally through the original extraction socket (c).

Four simple interrupted sutures were placed (a) using 3-0 gauge braided silk. The sutures one week later with initial healing of the soft tissues (b).
Crown and Bridgework

- Once healing of the extraction socket had taken place, at 5 months, the patient enquired about a replacement of the gap
- I discussed the options with the patient as detailed below:
  1. Single cantilever bridge with the UL4 as the abutment. Explained that tooth is healthy, with the restoration recently placed. However, this would produce a distal cantilever which has a reduced prognosis than a mesial cantilever
  2. Single cantilever bridge from the UL6. UL6 has more root surface area to support the bridge and favourable as a mesial cantilever. However, obturation appears inadequate and there seems to be slight loss of the lamina dura on the mesial buccal root. During the surgical procedure, for extraction of the UL5, I was able to directly visualise the UL6 mesial root and observed the very little buccal bone associated with it which may account for the slight radiolucency visualised on the periapical radiograph. Also, the crown would have to be removed which comes with a risk of fracture.
  3. Implant - private only and subject to analysis of bone
  4. Upper removable partial acrylic denture

- The patient decided on the first option
- The UR6 was prepared for a metallo-ceramic crown at the same visit.
Post Operative Intra-Oral Photographs
Reflection on Practice

Patient Management

I enjoy the management of anxious patients’ and this was a very interesting case to handle. It was unfortunate that the UL5 root proved too difficult to extract by conventional means, and I discussed the options for the surgical removal of the root including local anaesthetic, sedation, or general anaesthetic. The patient was happy for me to try it so long as she was adequately anaesthetised, and if she wanted me to stop the procedure for any reason, I would stop. Miss M related to me at subsequent appointments at how proud she was of herself for having the surgical procedure which was something she wouldn’t even contemplate only a few months earlier.

Treatment

I enjoy oral surgery, and I found this treatment particularly interesting. I had decided on a provisional plan of a transalveolar approach, but when I discussed the procedure with my practice principal, I was interested to hear his take on it using the apicetomy approach. I felt the procedure went well, albeit more technically demanding than I had originally envisaged. If I was to improve, I would have made the mesial relieving incision more diagonal than I did. Also, I ended up using 4 sutures to close the flap, but if the initial sutures were neater, I might have been able to use only 2 or 3. However, I learnt how I can overcome a situation where the flap was not approximated adequately with the intended number of sutures, and I am sure this will help me in the future. The site healed well.

I was happy with the crown and bridge preparations, which I felt had good taper and height to allow retention and resistance form. The margins were also well defined.

Team Working

Good communication with my nurse was essential to the success of the surgical procedure. It is essential to make sure that instruments are exchanged safely and efficiently, there was adequate irrigation to cool the surgical instrument, and suction when required. Utilising the experience of other members of the dental team was very helpful for this treatment, and highlighted an idea that I hadn’t thought of.

Future Practice

I feel that I have expanded my knowledge and technical ability with regards to surgical extractions from this case. The skills I have acquired will be very useful for my Oral and Maxillofacial Surgery DF2 post, and also my future practice as a whole.