Treating a peri-radicular abscess

Dentist Nicolai Orsteen presents a clinical case study looking at the treatment of a maxillary left lateral front tooth.

The patient is a 24-year-old white Northern European male. His chief complaint was pain from the maxillary left lateral front tooth, with periodic swelling of the left anterior palatal.

The patient's dental history indicated previous problems in this region, documenting an emergency appointment in March 2007 due to pain and swelling from tooth 22. Following this appointment, the patient was referred for examination and treatment of tooth 22.

**Diagnosis**
The extra-oral examination on 30 January 2008 was within normal limits, shown in Figures 2 and 5. However, as is visible in Table one, the intra-oral examination revealed gingival bleeding on probing, no sinus tract and fluctuant swelling of the palatal mucosa in the area of teeth 21, 22 and 23. The periodontal pockets however, were within normal limits.

Following the investigations, the diagnosis showed that a peri-radicular abscess was related to non-vital tooth 22. The problems associated with the diagnosis were a wide root canal, and an open apex with large apical lesion.

The structured treatment plan involved conventional root canal treatment, and to be assessed for surgery after six months.

**The treatment plan**
Treatment commenced on 3 February 2008. Following an initial clinical examination, the tooth was diagnosed with and apical abscess (no sinus present). Access was gained under a rubber dam and the canal was filled with exudate.

The root canal length was determined both by apex locator (RootZ3) and a periapical radiograph. The root canal disinfection was completed mechanically using Hedstrom files (size 90/20 mm/incisal edge).

Particular care was taken during irrigation due to the open apex, and ultrasonics were used for the further cleaning of the canal. A formula of one per cent NaOCl, two per cent CHX and 17 per cent EDTA were used for chemical root canal disinfection. The canal was dressed with Ca(OH)2 and IRM was applied as a temporary filling.

Five days after the completion of the treatment, the patient sought emergency consultation because of severe pain and swelling from tooth 22. He was prescribed an eight-day course of clindamycin (500 mg x 3/5) to ease the discomfort.

Following the surgery, on May 29, tooth 22 was asymptomatic and swell sensitive to percussion. The temporary filling was removed and the root canal disinfected again with Irrisafe, as well as a formula of one percent NaOCl, two percent CHX and 17 percent EDTA. A long-term intra-canal dressing with Ca(OH)2 was placed, and IRM was applied as a temporary filling.

**Preparing for root treatment**
The patient missed the following three appointments, but returned on October 14. On this date the tooth was still sensitive to percussion and palpation. As there were no real signs of improvement, it was decided that the tooth should be root filled and an appointment for apical surgery was made. To ease discomfort, the root canal was filled with an 8mm length of white MTA, and a wet cotton pellet was placed over the MTA. On top of the cotton pellet, a temporary filling with IRM was placed.

The re-operative procedure was carried out on November 6. A marginal incision from the mesial aspect of tooth 21 and to the distal aspect of tooth 25 was made, followed by 5mm vertical releasing incisions at the mesial aspect of tooth 21, and a length of 10mm at the distal aspect of tooth 25. The mucoperiosteal flap was elevated (see Figure 10), and a pathological fenestration of the cortical buccal bone was evident, approximately 3mm from the marginal bone crest between teeth 22 and 23. An ostectomy was performed after which the lesion was treated by curettage. The palatal cortical bone also had a pathological perforation, a root-end resection of about three millimeters of the root. The root end was inspected through the operating microscope, and no fracture was found.

The adaptation of the white MTA to the root canal was performed using an adapted white MTA dressing and wet cotton pellets.

**Table 1: Clinical findings**

<table>
<thead>
<tr>
<th>Tooth</th>
<th>21</th>
<th>22</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity to Cold</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Percussion</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Palpation</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Mobility</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Probing Depth (mm)</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Restoration</td>
<td>None</td>
<td>Composite (Pal)</td>
<td>None</td>
</tr>
</tbody>
</table>

![Fig 1. Frontal view](image)
![Fig 2. Frontal view](image)
![Fig 3. Working length radiograph](image)
![Fig 4. MTA in the canal](image)
![Fig 5. MTA in the canal](image)
![Fig 6. MTA in the canal](image)
![Fig 7. MTA in the canal](image)
![Fig 8. MTA, wet cotton pellet and IRM](image)
![Fig 9. White MTA in the canal](image)
![Fig 10. Elevation of surgical flap](image)
![Fig 11. Granulation osteotomy](image)
![Fig 12. Granulation tissue removed and root-end resection performed](image)
![Fig 13. Flap sutured with 6-0 silk sutures](image)
judged as good and the operation site was inspected and rinsed with sterile saline, before being sutured with five 6-0 silk sutures.

The patient was informed about the prognosis of the tooth and given post-operative instructions. Six 400mg Ibuprofen tablets were dispensed, and the patient was instructed to take one every four hours in the first day following surgery. A prescription of Penicillin V tablets (qds 660 mg *4) for seven days was also given.

The sutures were removed on November 15, and there was evidence of good soft tissue healing. The patient experienced no discomfort from the surgical site.

The temporary filling and cotton pellet were removed during the post-treatment restoration procedure, and replaced by a composite restoration (55 per cent phosphoric acid, Adper, Scotchbond, Filtek Flow (A5) in the apical part, Filtek Supreme (A3D and A2B) in the coronal part). Teeth 21 and 25 maintained vitality. The histological report of the lesion showed a partial epithelium lined cystic wall with intense chronic to acute inflammation, consistent with a radicular cyst.

Result

The patient’s long-term prognosis is uncertain, due to the thin root canal walls and risk of fracture.

Follow-up

On November 15 for a twelve-month post-surgery appointment, the patient was still asymptomatic. Teeth 21 and 23 were sensitive to ice-test, and there were no periodontal probing depths over four millimetres around tooth 22.

The radiograph showed evidence of healing.

About the author

Dr Nicolai Orste &n graduated from the University of Oslo in January 2002, completing his specialist training in endodontics in June 2009. He then worked in general practice in Oslo from February 2002 was also a secretary on the regional dental board in Norway from 2006 to 2008. From August 2008, Nicolai worked at a specialist practice in Oslo before joining the specialist team at Endocare Richmond and Harley Street. For more information please call 020 7224 0999 email reception@endocare.co.uk or visit www.endocare.co.uk.