Nonsurgical Root Canal Therapy of a Three Rooted Maxillary Second Premolar
A Case Report

IUSD Department of Graduate Endodontics
B.P. RICKETTS,* K.J. SPOLNIK, and M. M. VAIL

Abstract
The main objective of endodontic therapy is to treat pulpitis and periodontal issues in order to retain the natural dentition so that normal form, function, and esthetics will be maintained. In order to achieve this goal, it becomes imperative to remove canal contents, specifically living, infective, microorganisms by a system of chemomechanical debridement. The advent of contemporary technology with chemomechanical debridement and magnification has provided an enhanced ability to achieve maximum canal disinfection. However, the practitioner must have a detailed and extensive knowledge of the most common patterns in root canal morphology and anatomy for each tooth.

Background
Teeth exhibit root canal morphology that is often extremely complex and highly variable.1-6 The success of root canal therapy presents a case of a three-rooted maxillary second premolar that was treated with nonsurgical root canal therapy.

Maxillary Second Premolar: Number of Roots

<table>
<thead>
<tr>
<th>Number of Teeth</th>
<th>Number of Roots</th>
<th>One Root</th>
<th>Two Roots</th>
<th>Three Roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>8513</td>
<td>90.7%</td>
<td>8.2%</td>
<td>0.2%</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Summary of Studies Examining Number of Roots in Maxillary Second Premolars

Maxillary Second Premolar: Number of Canals

<table>
<thead>
<tr>
<th>Number of Teeth</th>
<th>Number of Canals</th>
<th>One Canal</th>
<th>Two Canals</th>
<th>Three Canals</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2743</td>
<td>50.3%</td>
<td>46.8%</td>
<td>1.2%</td>
<td>2%</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Summary of Studies Examining Number of Canals in Maxillary Second Premolars

EXAMINATION & Initial Treatment (7/30/09)

A 24 year old male presented to VA Endodontic with chief complaint of, “This tooth up here is a little bit sensitive but mainly its around my gum.” Intraoral examination revealed area of localized erythema, edema, and alinement associated with root of second maxillary premolar. It appeared as though tooth extending upon long axis of tooth was approximately seven millimeters. Granulation tissue was evident and area was not sensitive to palpation. Provisional restoration was intact with no signs of compromise in integrity or marginal adaptation. Patient was anesthetized and access was re-established under rubber dam isolation. Previous established working lengths confirmed, and chemomechanical debridement continued with hand and rotary files with six percent sodium hypochlorite. Final radiograph was acquired revealing obturation of all canals, and coronal marginal integrity.

TREATMENT

Treatment options, benefits, and risks were explained to patient, at which point verbal and written consent were obtained. Treatment was performed in accordance with MOD composite resin coronal restoration and secondary decay were removed and access was created with dental handpiece and finish bur. The edges of the access opening were modified creating a triangular configuration at the base in the buccal direction and a Y-shaped configuration at the mesial and distal. The coronal portion extending from the floor of the pulp chamber was meticulously removed with an air turbine handpiece and bur to expose the floor of the pulp chamber. The floor itself was then removed with hand instruments, and instrumentation was performed utilizing Gates-Glidden drills and reciprocating files. The canal space was then obturated using the lateral condensation method with gutta-percha and sealer and condenser. The access was then restored with resin-modified glass ionomer.

Patient returned for follow-up appointments at 7, 14, and 18 days post completion of treatment. Patient indicated no symptoms and all parameters were within normal limits.

Conclusion
Clinicians should be aware of norms as well as variations in root and pulp anatomy before beginning root canal therapy. Endodontic success in teeth with a number of roots and/or canals above that normally found requires reevaluation of conventional diagnostic and radiographic techniques. In some cases, access cavity modifications may be required during treatment. Complex root canal anatomy can be predictable managed following accurate identification and successful cleaning, shaping, and filling of root canal system.

References

9. necklace examination revealed no signs of swelling, lymphadenopathy, trauma, temporomandibular dysfunction, caries or sinusitis. Patient’s maximum incisal opening was within normal limits. Intraoral examination revealed no signs of swelling, edema, hypertrophy, or ulceration, deviation of tongue from the midline, elevation of the floor of mouth, or obstruction of airway. Cancer screening revealed no signs of thickened, fibrous, fissured tissue associated with lateral mass of base of skull consistent with smoldering or recent nasopharyngeal or oral cavity inflammation.