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## Endodontic Emergency Related to Retreatment of a Previously Inadequately Treated Tooth

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### Introduction

For some patients, pain, swelling, or both have been the triggering events for the first endodontic appointment. In most instances, these symptoms will have been alleviated after initial emergency appointment. However, pain or swelling may persist at the same levels or increase in their severity.

Dentist has to make an accurate diagnosis and infection control within a limited period of time. It can be relatively easy to diagnose and alleviate the symptoms when the pain and swelling are originated from a tooth that has not been treated previously. Pulpotomy, pulpectomy or complete instrumentation can be the treatment of choice. However, when the symptoms are related to a tooth that needs retreatment, it becomes more difficult to diagnose the exact origin of the pain and relieve the symptoms in a short period of time.

The purpose of this report is to present a case of endodontic emergency related to endodontic retreatment and to make a speculation on the causes of acute symptom and its management.

### Case Report

On February 2000, a 22-year-old male patient visited the Conservative Dentistry Clinic of Kyungpook National University Hospital with severe pain on his mandibular right second molar.

On the clinical examination, the second molar was sensitive to percussion, but not to palpation. It was more mobile than its adjacent mandibular first molar. No gingival swelling was seen and normal periodontal apparatus was observed. Radiographs showed that the tooth was treated endodontically, but the quality of radiopaque intracanal image implied improper cleaning and shaping of previous treatment. It also showed a well-defined round periapical radiolucency (10mm×10mm) around the mesial root end of mandibular second molar (Fig. 1).

On the past dental history, the second molar was treated endodontically because of caries, and crowned seven years ago. The patient had not felt any discomfort in the tooth until three days ago. Pain was initiated when he ate food, then aggravated seriously enough to bother his night sleep.

Diagnoses of pain related to previous root canal treatment and symptomatic chronic periapical lesion were established and the proposed treatment plan consisted of thorough debridement of the entire root canal system and obturation for the ultimate resolution of the pathosis.

On the first visit, analgesics (Tarasyn, 30mg/day, NSAIDs), and antibiotics (Amoxaphen, 750mg/day, amoxicillin) were prescribed for the control of acute infection/inflammation and pain. Sedative-hypnotic (Valium,

12mg/day, benzodiazepine) was prescribed for inducing night sleep.

At the next visit, the patient expressed less pain. After removing gold crown and old access cavity filling material, pulp chamber was opened. Old gutta-purca was removed using an engine-driven rotary file system (ProFile<sup>®</sup>, Maillefer, Ballaigues, Switzerland). Mesiolingual and distolingual root canals were negotiated and instrumented to the apex. Oozing of yellowish exudate was noted from the mesial root canal. Mesiolingual and distolingual root canals were sealed after intracanal medication with calcium hydroxide paste. But mesiobuccal and distobuccal root canals were not treated (Fig. 2).

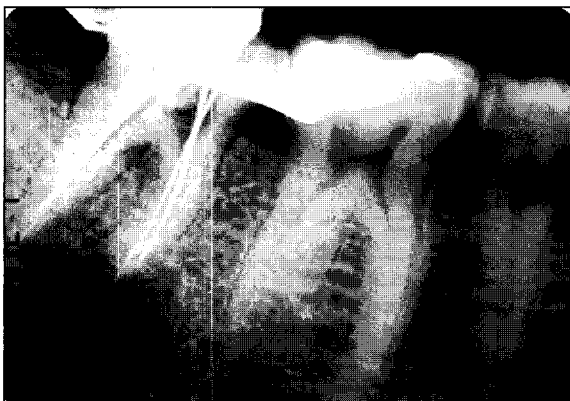
Three days later, patient complained pulsating pain again without any visible signs of swelling. The tooth showed increased mobility. Radiograph examination revealed the possibility of other two root canals both in mesial and distal roots. Missed mesiobuccal and distobuccal root canals were found through careful negotiation procedure. Root canal treatment was done on four canals (Fig. 3). Crown-down preparation method was applied with ProFile<sup>®</sup> and GT<sup>™</sup> file. Root canal irrigant was 2.5% sodium hypochlorite solution. All symptoms have disappeared. All the root canals were obturated with gutta-percha using Continuous Wave of Condensation technique (Fig. 4). No more flare-up has happened since his last visit in May, 2001.



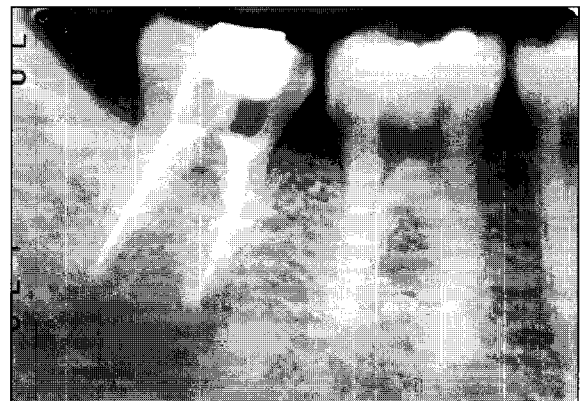
**Fig. 1.** Preoperative radiograph, inappropriate root canal treatment and periapical radiolucency at root apex of mandibular right second molar are seen.



**Fig. 2.** Instrumentation of mesial and distal canal (finally proved to be mesiolingual and distolingual canal). Gutta-purca remnant showed the possibility of other root canals.



**Fig. 3.** All four root canals were negotiated



**Fig. 4.** Root canals were filled successfully.

## Discussion

Pain and swelling are the most complicated problems for dentists, especially when they are associated with previously incompletely treated tooth. The cause of acute exacerbation can be multifactorial, but the primary cause may be a microbial factor related to the contents of the infected root canals<sup>1,2</sup>.

The emergency conditions relate to root canal treatment may be classified as follows<sup>3,4</sup> : 1) Vital pulp - irreversible pulpitis - normal periapex, 2) Vital pulp- irreversible pulpitis - acute apical periodontitis, 3) Non-vital pulp - acute apical periodontitis - no swelling, 4) Non-vital pulp - fluctuant swelling - drainage obtained through canal, 5) Non-vital pulp - fluctuant swelling - no drainage through canal, 6) Non-vital pulp - diffuse swelling - drainage through canal, and 7) Non-vital pulp - diffuse swelling - no drainage through canal.

The most important thing in managing endodontic emergency is to relieve the acute pain of patients. If acute symptoms could be alleviated, routine root canal treatment can be set aside until the next visit. Effective management of patient with endodontic pain starts with "three Ds" : Diagnosis, Definitive dental treatment and Drug<sup>5</sup>. After correct diagnosis, pulpotomy, pulpectomy, or complete instrumentation can be the choice of treatment if patient's tooth has pulpitis, pulp necrosis, or apical periodontitis associated with pulp necrosis<sup>6,7,8</sup>. It also may be affected by time available for the treatment especially when posterior teeth are involved.

Without thorough cleaning and debridement, pain can persist or worsen as inflammatory process extends into the periradicular area. The present case shows this aspect obviously. The probable causes of acute symptoms may be necrotic pulp tissue, persisting bacterial infection, and coronal leakage or/and inflammatory process associated with these noxious stimuli. In this case, mid-treatment flare-up had occurred. The etiological factors for such sequelae might be complex. They may be the result of microbial factors related to the contents of an infected root canal and/or clinical treatment procedure including debris extrusion and over-instrumentation<sup>9</sup>. Reevaluation of all conditions including careful reading of radiographs suggested the possibility of the existence of other missing canals. Before mid-treatment flare-up had happened, the number of root canal were regarded as two since these canals were hidden under the tooth-colored filling material in the pulp chamber, and mesiolingual and distolingual root canal orifices were located relatively central side of each root. When patient presented pain again, antibiotics and analgesics were prescribed to support the patient in reducing the possible local infection/inflammation reaction. After negotiation and instrumentation of all four canals, symptoms subsided. Dorn et al.<sup>3,4</sup> reported that the chance of eliminating pain is directly proportional to the degree of cleaning and shaping.

When the symptom develops in a previously endodontically treated tooth, emergency care is limited. Systemic administration of antibiotics and analgesics may be done, however they are helpful only for achieving temporary resolution.

Pain related to an emergency visit can be categorized as acute pain. In the early stage of an acute apical abscess, pain may be severe. It is often more severe when pus is still confined to the alveolar bone than it will be later on when pus can escape into soft and more yielding tissue<sup>10</sup>. In the absence of apical swelling, endodontists prefers to prescribe non-steroidal anti-inflammatory drugs to narcotics<sup>5,6</sup>. Prescribing analgesics is more effective when the doctor takes into consideration the patient's history. "What pain medication has worked for you in the past?" is usually a good way to begin the decision making process.

If drainage is established, it will help in reducing pain. After resolution of symptoms, routine root canal therapy must be followed. In cases of local or diffuse abscess, the cardinal rule in managing infection is to attempt to establish drainage<sup>11</sup>. Systemic use of antibiotics in treating swelling due to pulpless tooth should be regarded as an aid to the procedures for establishing drainage. The use of antibiotics alone without a concurrent attempt to establish drainage generally is not considered as an appropriate treatment. In instances in which drainage cannot be achieved, antibiotic therapy must be used as the primary therapeutic method for the resolution of the abscess.

The objective is to aid elimination of pus from the tissue space.

In case of endodontic emergency especially related to inappropriate previous root canal treatment, individual patient's problems are complicated in placing them into specific categories. Therefore composing a "cook book" approach is impossible. Only knowledge about sound biological principles and clinical experience are the ingredients needed to treat these problems.

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