

SOUTH CALGARY ENDODONTICS

SPRING 2015

403-474-1893

www.southcalgaryendo.ca



Welcome Dr. Kamil Kolosowski to South Calgary Endodontics. Dr Kolosowski received his Honors Bachelor of Science Degree from the University of Toronto in 1999. He completed his Degree in Dentistry at the University of Western Ontario in London in 2003. Dr Kolosowski enjoyed practicing general dentistry for 8 years before returning to the University of Toronto to complete the Graduate Endodontics Program.

Monday-Thursday 8:30-4

Friday 9-12

SAME DAY EMERGENCY
APPOINTMENTS



This newsletter will focus pulp regeneration for the general practitioner. When a young patient presents to their general dentist an immature tooth, open apex and necrotic pulp. Traditional treatments of apexification or extraction with possible orthodontic treatment were the only options. Over the past decade a new field of pulp regeneration/revascularization has gained a foothold in endodontics.

Join us at our clinic on Thursday June 18, 2015 at 6:00pm for an informal lecture on the diagnosis and options to treat necrotic teeth with immature apices. This lecture qualifies for 2-3 CE points. Refreshments will be served.

RSVP to: kelly.southcalgaryendo@shaw.ca or call 403-474-1893 by June 12th

Protection of the pulp vitality in an immature tooth with open apex will allow the continued root length and root dentin width formation. In the case of deep caries, pulp vitality can be retained if pulp capping or partial pulpotomy can be properly performed (Cvek). This will permit apexogenesis. However, when the pulp becomes necrotic then the further development of the root will cease and, unless vital pulp tissue can be artificially induced back into the root canal space.

Other than extraction, possible orthodontic tooth movement or prosthetic replacement, traditional treatment for a necrotic pulp in an open apex tooth was to perform a root canal therapy. This would consist of root canal instrumentation with irrigation and either placement of a large size gutta-percha cone or performing an apexification procedure. In a child apexification has been a standard of care until a few years ago. Calcium hydroxide dressing would be placed in the canal and left in place until a hard tissue barrier forms at the apex. This would ultimately allow the compaction of a root filling material in the canal space. The entire treatment process would usually take several months and often required multiple appointments to change the calcium hydroxide dressing. Alternatively, mineral trioxide aggregate (MTA) has more recently been used to create apical barrier once the signs and symptoms of infections are resolved. Although apexification procedure resolves the problem of pulp necrosis and potential for apical periodontitis, it leaves the pulps teeth non-vital and additionally makes the tooth much more susceptible to fracture, which occurs in 28%-77% of cases.



Fig. 1a

Fig. 1b

Fig. 1c

Figure 1a: Preoperative radiograph of necrotic 45 with apical periodontitis.

Figure 1b: Shown here is the MTA apexification plug placed at the apex and extending 4mm coronally

Figure 1c: One-year follow-up shows final restoration and the resolution of the apical periodontitis

Tooth 45 has been successfully treated with MTA apexification. Although the signs and symptoms of infection have been successfully treated. The remaining wall thickness and root length is much more decreased in comparison with tooth 44. Tooth 45 has a much greater chance of cervical or root fracture than tooth 44.

Decades ago it was noted that adult necrotic teeth with apical periodontitis that were treated endodontically and obturated short of the apex often had healthy soft tissue re-grown into the apical portion of the root canals. This was confirmed when these teeth were extracted and histologically tested. This led researchers to consider the idea of pulp regeneration. The pulp cells that are present in immature teeth remain vital even if necrosis with apical periodontitis or an abscess occurs. These “stem” cells can be utilized to provide new vasculature and connective tissue within the canal space of the necrotic tooth. The immature tooth possesses a large apical size that is conducive to the re-growth of the tissue. The stem cells ensure that root formation resumes and continues until the original genetically programmed root length is achieved.

The procedure leading to pulp regeneration involves not involve root canal instrumentation. Disinfection of the canal is achieved using root canal irrigation during the first visit. Low 1.25% concentration of sodium hypochlorite (NaOCl) is perfectly suited for the disinfection of the canal while ensuring the survival of the stem cells. Canal medicaments in the form of antibiotic paste (triple or double), or calcium hydroxide is placed in the root canal space until the resolution of symptoms at the second appointment.



Fig 2a

Fig 2b

Fig 2c

Figure 2a: Triple antibiotic paste in the canal space

Figure 2b: Collagen with blood clot is seen in the pulp chamber

Figure 2c: MTA plug has been placed on top of the blood clot and collagen.

Final restoration can now be placed.

At the second appointment EDTA is used to remove the medication in the canal . The stem cells from the apical area are introduced into the canal space using a blood as a transport medium. The blood clot in the root and collagen plug in the coronal portion serve as a scaffold for the future pulp tissue growth. A MTA plug is placed in the pulp chamber, and a tight coronal seal and a final filling is placed.



Fig. 3a



Fig. 3b

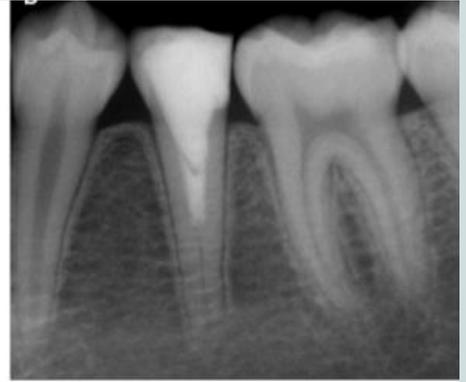


Fig.3c

Figure 3a: Preoperative radiograph, endodontic treatment was initiated 3 months prior, apical periodontitis is seen at tooth 35

Figure 3b: Treatment completion with MTA over the blood clot

Figure 3c: 12 month follow up.

The above case exemplifies the complete resolution of apical periodontitis. Over the 12 months following the treatment the root length had increased and the wall continued its calcification and thickening.

It is very important to monitor the tooth over the next several months and years to ensure continued root formation. Root length and the thickness of the dentin wall should increase, and the root apex shape should attain roundness. Tooth vitality maintenance and regression of the apical lesion are the goals of the regeneration therapy. In case of treatment failure, the traditional approach discussed earlier can still be employed.



Fig 4a

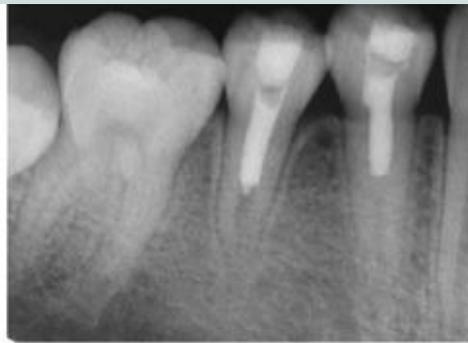


Fig. 4b



Fig. 4c

Figure 4a: open apices with signs of periapical periodontitis, and subsequently underwent regenerative procedures.

Figure 4b: after 6 months both teeth had resolution of apical periodontitis and roots continued to form.

Figure 4c: Follow-up at 5 years shows root apices have formed successfully

In recent years teeth that have undergone regeneration procedures have greatly diminished the likelihood of root fractures. Clinical studies have shown that regeneration procedures should be attempted for the immature teeth with open apices.