



Apical curettage and retrograde obturation without apicoectomy. Clinical case presentation

Curetaje apical y obturación retrógrada sin apicectomía. Presentación de un caso clínico

María Elena Hofmann Salcedo,* Ana Gabriela Carrillo Vázquez,* Julio César García Briones,*
Dulce Yicel Magaña Mancillas,* Santa Rosario Zamora Ibarra,* Luis Alberto Gaitán Cepeda[§]

ABSTRACT

Apical curettage with apicoectomy is a component of many endodontic surgical procedures. It purports the aim of removing any contents present inside the surgical cavity, such as granulation tissue, cystic membrane remnants, or foreign bodies, as well as removing the involved dental apex. Nevertheless, in some cases, performing an apicoectomy can negatively influence the restoration's stability; in these cases an alternative treatment could be performing apical curettage without apicoectomy. The present article documents a clinical case where apical curettage and retrograde obturation with mineral trioxide aggregate cement were performed on a tooth where previous conventional endodontic treatment had failed.

Key words: Apical curettage, apicoectomy retrograde obturation, MTA cement.

Palabras clave: Curetaje apical, apicectomía, obturación retrógrada, cemento MTA.

RESUMEN

El curetaje apical con apicectomía forma parte del procedimiento quirúrgico endodóntico. Tiene la finalidad de remover el contenido presente en el interior de la cavidad quirúrgica, como tejido de granulación, restos de membrana quística, cuerpos extraños y eliminar el ápice dental involucrado. Sin embargo, en determinados casos el realizar una apicectomía puede influir en la estabilidad de la restauración en donde la alternativa del tratamiento pudiera ser un curetaje apical sin apicectomía. En este artículo se presenta un caso clínico donde se realizó un curetaje apical y obturación retrógrada con cemento agregado trióxido mineral en un diente con fracaso de un tratamiento endodóntico convencional.

INTRODUCTION

After failure of root canal treatment, apical surgery is the last available resource to solve inflammatory processes in the periapical zone. This procedure consists on exposing the apex of the involved tooth, achieving curettage of periapical tissues, cutting the apex, ultrasonically preparing said apex and finally, placing a suitable material to seal the cavity. Ideally, this procedure should remove irritant agents from the root canal systems and periapical tissues, as well as isolate and seal bacteria which would be unreachable by other means, so as to allow tissue regeneration or reparation.¹ Nevertheless, when suitable relationship between crown and root is absent, cutting the apex might compromise tooth stability within its socket,² therefore, preserving the total length of the tooth would be a goal to target. A long, slender and narrow-walled apical cavity can be achieved with the use of ultrasonic tips. With this procedure, small amounts of dental tissue are lost, and thus, perforation risks decrease and placement of retrograde material is simplified.³ This obturation material must possess the

capacity of sealing bacteriae and their products within the root canal, avoiding thus its egress into periapical tissues and allowing tissue regeneration.⁴

Aiming at contributing to show alternatives to preserve teeth with inadequate crown-root relation in the mouth, the main objective of the present article was to describe a clinical case where periapical curettage without apicoectomy was performed on a tooth exhibiting the aforementioned characteristics.

CASE REPORT

A 37 year old female patient attended in 2011 the Endodontics Clinic of the Autonomous University

* School of Dentistry Autonomous University of Baja California, Tijuana.

§ School of Dentistry, National University of Mexico (UNAM).

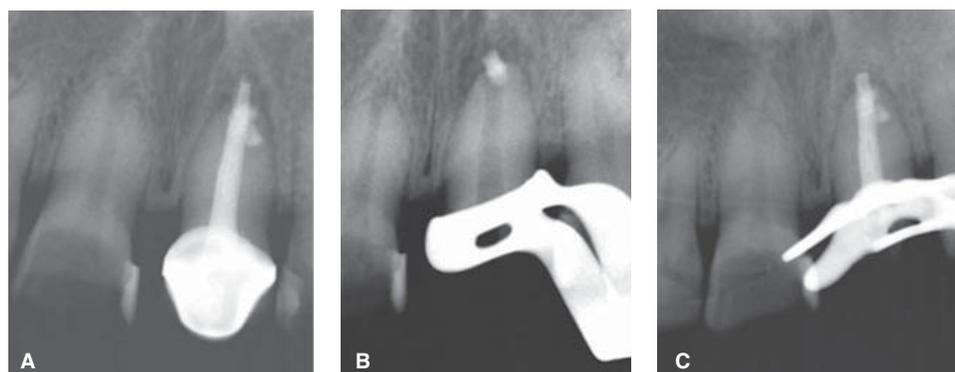


Figure 1.

Radiographic images. **A)** Initial X-ray. **B and C)** Re-treatment X-rays.

of Baja California, Tijuana campus. The patient complained of a constant pain in tooth number 21. Said tooth had previously been subjected to root canal treatment. Radiographic examination revealed extrusion of the obturation material previously used in the root canal treatment towards the periapical space (*Figure 1A*). It was suggested to re-treat the tooth, targeting the full removal of filling material. Nevertheless, during this procedure, it was not possible to remove material which extruded towards the periapical zone. A calcium hydroxide intra-canal medication was applied. It remained in place for two weeks, with the intent of re-obturing the canal after that time (*Figures 1B and C*). It was explained to the patient that ideal treatment would entail placement of an endo-post as well as surgical removal of material and inflammatory tissue. The patient voluntarily abandoned treatment; she returned five months later exhibiting once more the previous symptoms. The patient was medicated with antibiotic and anti-inflammatory therapy and surgery was once again programmed. An optic fiber endo-post was placed prior to surgical procedure. Before administering supra-periosteal local anesthesia, a muco-gingival flap was raised, with two liberating incisions; this procedure purported the aim of preserving gingival papillae as well as acquiring adequate surgical access. Once the flap was raised, it was possible to view the buccal plate destruction of the affected tooth; this allowed easy location of the apex. Nevertheless it was necessary to perform an osteotomy with a surgical round burr in order to widen the cavity and gain better access to the area to be operated (*Figure 2A*). Periapical curettage was later conducted in order to remove granulation tissue as well as extruded gutta-percha towards the periapex (*Figure 2B*). After this procedure, a retrograde cavity was ultrasonically prepared to later be filled with mineral trioxide aggregate (MTA) cement. Finally, the flap was re-

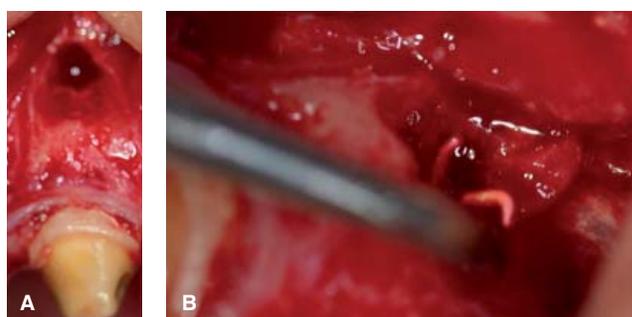


Figure 2. Images of surgery day. **A)** Surgical approach. **B)** Removal of extruded material during curettage.

positioned, and the wound was sutured with 3.0 black silk. During the surgical event, it was decided not to perform an apex incision, due to the short length of the root. Once the soft tissues had healed, the patient was remitted to the restorative dentistry clinic of the same university in order to complete dental rehabilitation.

At a six month recall visit, the patient did not report any symptoms and radiographic examination revealed decrease in the size of the bone cavity (*Figures 3A and B*).

DISCUSSION

Indications for apical curettage treatment are persistence of symptoms and presence of bone lesion.³⁻⁵ From the endodontic perspective, re-treatment should always be considered before surgical treatment, since there is evidence of greater healing rate in cases where re-treatment was performed before apical surgery.⁶

A study conducted on tissue healing based on radiographic changes, showed that there was a direct relationship between size of lesion and healing time. A lesion smaller than 5 mm will approximately take 6.4

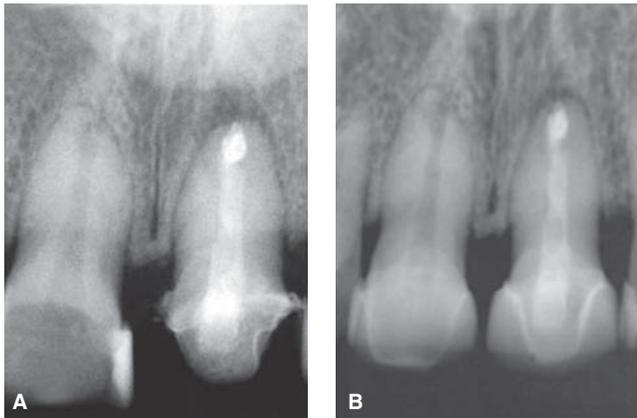


Figure 3. Radiographic images. **A)** Surgery day. **B)** Control X-ray 6 months after surgery showing decrease of bone lesion.

months to heal, a lesion of 6 to 10 mm will take 7.25 months and lesions larger than 10 mm will require in average 11 months to heal.²

Apicoectomy has been proposed as a requirement and fundamental part of periapical surgical procedures. Nevertheless, in special cases, the convenience of conducting an apical cut must be carefully pondered. Root length is one of the specific situations to consider. An endodontically treated tooth will exhibit a final 97.5% restoration success rate in cases when the length of the endo-post is equal to or greater than the crown's length.⁷

The present case documented a specific situation since root length was 11 mm and crown length was 8 mm. Bearing in mind that retrograde obturation material depth is a recommended 3 mm, that would leave us with a final 8 mm root length for post placement, thus apex sectioning would compromise the endo-post length, decreasing force distribution and retention, as well as tooth stability within the alveolus. Conventional alternative to the present case would have been tooth extraction.

In the case here presented, the surgical technique was particularly thorough, in such a way that cavity depth for retrograde obturation material was 3 mm as suggested by different authors.^{2,5} Apicoectomy

was not performed, but retrograde obturation was indeed conducted using MTA cement. This cement fulfills most ideal characteristics such as, among others, being capable of hermetically seal the apical portion of the root canal, and promote periapical tissue healing due to its low toxicity to those tissues.^{2,8}

In concordance with several authors, the present clinical case could be rated as a success, since, at the six month recall visit, no pain was reported, soft tissues exhibited no alterations, the tooth was in appropriate function and the size of the bone lesion had decreased.^{3,5} The case presented in this article documented the possibility to preserve a tooth, which would have been doomed if conventional considerations of an apicoectomy would have been adhered to.

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Mailing address:

M.O. María Elena de los Ángeles Hofmann Salcedo

E-mail: elena.hofmann@uabc.edu.mx