Surgical Treatment of a Keratocystic Odontogenic Tumor

A Case Report

IUSD Department of Graduate Endodontics

J. BARNEY,  M. VAIL,  K. SPOLNIK

Introduction

Periapical surgery or apicectomy is commonly used to surgically treat failing root canal therapy and to remove lesions, such as periapical granulomas, periapical cysts, or other lesions. This case report describes the treatment of a patient who presented to the graduate endodontic clinic with a large vestibular swelling located apical to the maxillary right premolars and extending to tooth #2. A definitive diagnosis could not be confirmed based on the patient’s symptoms and clinical findings. It was determined to prepare this site for surgery and removal of the lesion for biopsy. Also, because of the close anatomic relationship of tooth #4 and the lesion, and the high likelihood of de-vitalization of tooth #4 during the surgery, endodontic therapy was performed on tooth #4 during the same visit that tooth #5 was obturated. A biopsy was taken and submitted to oral pathology for definitive diagnosis, wherein a diagnosis of odontogenic keratocyst was given. Patient returned for 6 month recall with no signs or symptoms of recurrence.

Background

Keratocystic odontogenic tumor (KCOT), formerly referred to as odontogenic keratocyst (OKC), is important to consider when treating periapical lesions, because of its high recurrence rate, its often aggressive nature, and its association with nevoid basal cell carcinoma syndrome. This neoplasm arises from remnants of the dental lamina, with increased mitotic activity in the epithelium lining of the cyst, epithelial budding from cells within the basal layer, chromosomal abnormalities, and mutation within the Patched (PTCH) gene. 1 Radiographically, KCOT presents as a unicystic or a multilocular radiolucency with well-defined borders. Clinically, KCOT presents with pain, swelling, and drainage, all of which makes diagnosis difficult, because of its resemblance to endodontic infections. The definitive diagnosis requires a histopathological examination following thorough enucleation and curettage. The histopathologic features of KCOT reveal a thin wall with a cystic lumen, containing either clear or a cheesy exudate. Another characteristic often seen histologically is a stratified squamous epithelium six to eight layers thick. The lumen surface may show detached epithelial cells and a characteristic flamed parakeratinized epithelial cells with a corrugated pattern. 2 In cases, where devitalization of closely associated teeth may occur during surgery, endodontic therapy may be needed. Also clinical and radiographic signs and symptoms that do not improve with suspected lesions of odontogenic origin following treatment, need further treatment with a biopsy to establish a definitive diagnosis.


An 82-year-old male was referred to the Graduate Endodontic Department at the Indiana University School of Dentistry for evaluation of the upper right maxillary region. The medical history was unremarkable. The patient reported swelling in upper right maxilla. No lymphadenopathy or other significant findings were noted. Introrally, a fluctuant swelling was noted in buccal vestibule apical to tooth #5 and extending back to the apex of tooth #4 (Fig. 1). A diagnosis of necrosis with asymptomatic apical periodontitis was made for tooth #5. During this initial visit, incision and drainage was performed on the swelling and a yellowish, mucous exudate was released. On a subsequent visit under local and anesthesia, a rubber dam was placed and an access cavity was made on tooth #5. Working length was established (Fig. 3), and the canal was chemically-mechanically instrumented to a 40/04 rotary file. Calcium hydroxide was placed as an intracanal medicament followed by cavit and IRM as a temporary restoration.

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Patient returned at two months for obliteration of tooth #5 after initial treatment with calcium hydroxide. The patient had some discomfort for a few days following the last visit, but since had been relatively asymptomatic. The patient did, however, complain that the swelling in the buccal vestibule around teeth #4 and #5 had returned. On intraoral exam, swelling was noted from tooth #5 extending back to distal of tooth #4. At this time, it was determined to prepare this area for apical surgery by finishing the endodontic therapy on tooth #5. Also, due to the close anatomic relationship of tooth #4, endodontic therapy would be performed on tooth #4 because of the high likelihood of de-vitalization during the surgery. The patient was anesthetized and rubber dam placed, access was made into both teeth #4 and #5. Chemo-mechanical preparation and potassium hydroxide were performed on tooth #5. Endodontic irrigation was performed using 5% sodium hypochlorite and 2% chlorhexidine in conjunction with a negative pressure irrigating device (EndoVac). Master cones were verified and obturation carried out with Resilon and Final Seal using warm vertical compaction technique.

Anesthesia were prescribed and patient was rescheduled for apicectomy on both teeth #4 and #5. Analgesics were prescribed and patient was rescheduled for apicectomy on both teeth #4 and #5. Analgesics were prescribed and patient was rescheduled for apicectomy on both teeth #4 and #5.

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Apicoectomy 9/24/2009

The patient returned four days later for immature evaluation of surgical site. The vertical releasing incisions were erythematous and patient was experiencing some localized pain to the surgical area but otherwise patient was healing without complications. Soft tissue were removed and sent for biopsy for definitive diagnosis. The patient was advised of the biopsy results, wherein a definitive diagnosis of keratocystic odontogenic tumor was confirmed (Fig. 7a and b). The patient was scheduled for six month follow-up and advised to contact the department if any swelling was to return.

Discussion

Keratocystic odontogenic tumors have a masked tendency to involve the mandible 66% to 80% times over the maxilla, especially involving the posterior body and ascending ramus of the mandible. KCOT can affect people from infancy to old age but with 60% occurring with individuals between the ages of 10-20 years old and with a slight male predominance. This case report does not seem to fit this predilection of involving the mandible in that this KCOT was involved in the maxilla premolar region. 3 Also, typical treatment of KCOT usually involves enucleation and curettage of the lesion for biopsy, but there is an alternative treatment of marsupialization or decompensation. 4 Due to the possible complications of surgery, such as bleeding, damage to vital structures, de-vitalization of associated teeth, and anesthesia, marsupialization can be beneficial for patients requiring less invasive treatment, with the KCOT cyst, epithelial budding from cells within the basal layer, chromosomal abnormalities, and mutation within the Patched (PTCH) gene. 1 Radiographically, KCOT presents as a unicystic or a multilocular radiolucency with well-defined borders. Clinically, KCOT presents with pain, swelling, and drainage, all of which makes diagnosis difficult, because of its resemblance to endodontic infections. The definitive diagnosis requires a histopathological examination following thorough enucleation and curettage. The histopathologic features of KCOT reveal a thin wall with a cystic lumen, containing either clear or a cheesy exudate. Another characteristic often seen histologically is a stratified squamous epithelium six to eight layers thick. The lumen surface may show detached epithelial cells and a characteristic flamed parakeratinized epithelial cells with a corrugated pattern. 2 In cases, where devitalization of closely associated teeth may occur during surgery, endodontic therapy may be needed. Also clinical and radiographic signs and symptoms that do not improve with suspected lesions of odontogenic origin following treatment, need further treatment with a biopsy to establish a definitive diagnosis.

References