Oral Diseases
Associated with Men

Course description

This course is the second in a series of oral pathology presentations emphasizing common diseases prevalent among patients throughout the life span.

Three oral conditions—dentigerous cysts, nasopalatine canal cysts and odontogenic keratocysts—are more common in men. The etiologies, clinical manifestations, symptoms and treatment options for these conditions will be discussed.

Course objectives

Upon completion of this course, the dental professional will be able to:

1. Describe the etiology, clinical manifestations, symptoms and treatment options for patients with dentigerous cysts.
2. Describe the etiology, clinical manifestations, symptoms and treatment options for patients with nasopalatine canal cysts.
3. Describe the etiology, clinical manifestations, symptoms and treatment options for patients with odontogenic keratocysts.
4. Describe the common characteristics shared by these three conditions.

Introduction

Appearances can be deceiving, particularly in the oral cavity. At first glance, dentigerous cysts, nasopalatine canal cysts and odontogenic keratocysts may not seem comparable, but they have several similar characteristics:

- They're more common in men (as the title of this article implies).
- They're located near or around teeth.
- They can be asymptomatic and, as such, are discovered radiographically.
- The odontogenic keratocyst can mimic the appearance of a dentigerous cyst or a nasopalatine canal cyst.

A *cyst* is an epithelium-lined sac containing fluid or a semisolid material. If it's related to tooth development, it would be classified as *odontogenic*; if not, it's *nonodontogenic*. The most common odontogenic cyst is the periapical (radicular) cyst.[1]

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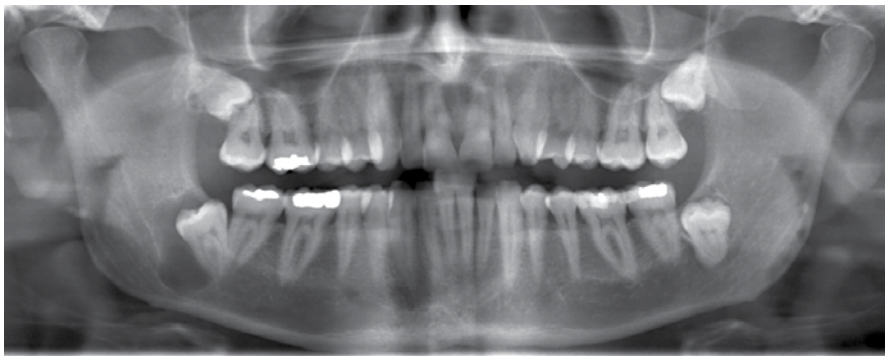

Fig. 1: A dentigerous cyst. Photo courtesy of Coronation Dental Specialty Group.

Dentigerous cysts

The *dentigerous cyst*, or follicular cyst, is the second-most common of the odontogenic cysts (Fig. 1). The cyst's epithelium originates from reduced enamel epithelium, the four layers of the enamel organ compacted into one layer by the developing enamel during the histodifferentiation (or bell stage) of tooth development. The cyst is frequently found in white men between 10 and 30 years of age, and forms around an unerupted and developing tooth.

It is attached to the tooth at the cemento-enamel junction,[1,2,3] most commonly in the area of the mandibular third molar. Maxillary third molars, maxillary canines and mandibular second premolars are other frequent locations. Occasionally, it may be associated with impacted supernumerary teeth. It rarely involves the primary dentition.[1,2,3]

The size range is from small to large. Small dentigerous cysts are generally asymptomatic and discovered radiographically when a tooth fails to erupt. They can displace teeth and resorb the roots of nearby erupted teeth. Large dentigerous cysts are not common and can cause the bone to expand, causing fracture and pain.[1,2,3]

Radiographically, a dentigerous cyst appears as a well-defined, unilocular radiolucency around the crown of an unerupted tooth. The most common radiographic appearance is the *central type*, in which the cyst surrounds the crown that extends into the cyst. The *lateral type* is common to mesioangular impacted third molars; the cyst grows laterally along the root and on the crown. In the *circumferential type*, the cyst surrounds the crown as well as a considerable portion of the root.[1,2,3]

Treatment involves surgical excision of the entire cyst and impacted tooth. It is unlikely that the cyst will recur. Ameloblastoma, an odontogenic neoplasm, may develop if the lining of the cyst is not removed completely. Approximately 17 percent of ameloblastomas arise within a dentigerous cyst. Epidermoid carcinoma and mucoepidermoid carcinoma are other potential mandibular complications.[1,3]

Nasopalatine cysts

The *nasopalatine canal cyst* can also be referred to as a nasopalatine duct and incisive canal cyst. It is the most common of the nonodontogenic cysts; therefore, it is not associated with tooth development. Prevalence rates of 0.08 percent to 33 percent have been reported. The cyst affects approximately one percent of patients, and is common in men ages 40–60. It has one unique location: the midline of the anterior maxilla, within the nasopalatine

Disclosure:
The author declares that neither she nor any member of her family has a financial arrangement or affiliation with any corporate organization offering financial support or grant monies for this continuing dental education program.

by Deborah Levin-Goldstein

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Fig. 2: A nasopalatine cyst.
Photo courtesy of D. Rosenbach.

duct (Fig. 2). The lining of this cyst originates from the epithelium of the primary and secondary palates.[1,4]

Some patients may present with swelling lingual to the maxillary central incisors, discharge, and pain that presents as a burning sensation in the anterior maxilla, which can travel to the bridge of the nose. A patient with a maxillary prosthesis may feel a pressure sensation beneath it. Other patients are asymptomatic.

In this scenario, the cyst is discovered by routine radiographs. Clinically, a small, pink bulge is noted near apices and between roots of the maxillary centrals on the lingual surface. Tooth displacement is common; bone expansion is not. The teeth are vital with no external resorption.[1,4]

Radiographically, a well-defined, heart-shaped radiolucency appears between and apical to teeth 8 and 9. Sometimes, the radiolucency is pear-shaped. The average diameter of this cyst is 1.5–1.7 mm. Three-quarters of all nasopalatine cysts are lined with stratified squamous epithelium. Pseudostratified columnar epithelium is the second-most common cyst lining, followed by simple cuboidal and columnar.[1,4]

Surgical excision is the treatment. Recurrence and malignancy are rare. Edentulous patients require surgery preceding denture fabrication.[1,4]

A cyst is an epithelium-lined sac containing fluid or a semisolid material. If it's related to tooth development, it would be classified as odontogenic; if not, it's nonodontogenic.

Odontogenic keratocysts

Odontogenic keratocysts (OKCs) were reclassified as keratocystic odontogenic tumors by the World Health Organization in 2005. For this discussion, only OKC will be used to refer to the third-most common odontogenic cyst/tumor that has pathognomonic clinical and histologic characteristics.

The lining of OKCs (Fig. 3) originates from cells of the dental lamina, from which the tooth germ develops. Most OKCs are found in white men ages 10–40, with peak incidences in the second and fourth decades of life. Multiple OKCs are associated with nevoid basal cell carcinoma syndrome, also known as Gorlin syndrome. This hereditary disease has serious oral and systemic complications. Five percent of patients with OKC have nevoid basal cell carcinoma syndrome.[1, 7, 8, 9]

OKCs can be located in the mandible or the maxilla, but are twice as common in the mandible. Generally, they're located in the posterior mandible and ramus. Unlike the previous two cysts discussed, OKCs have aggressive potential.[1, 5, 6, 9]

Some patients are asymptomatic. Generally, routine radiographs are responsible for the discovery of the OKC, just as with the previous two cysts. Other patients may have soft-tissue swelling and pain, drainage, and paresthesia of the lip or teeth. In 25–40 percent of patients, an unerupted tooth is present.

An OKC can move teeth and, less frequently, resorb external tooth structure. It does not cause bone expansion initially, because it grows within the medullary spaces of the bone. As the lesion grows, bone expansion is noted in approximately 50 percent of mandibular lesions and 30 percent of maxillary lesions.[1, 9]

OKCs have no distinguishing radiographic characteristics. Usually, a well-defined, multilocular radiolucency with scalloped margins is seen. Unilocular lesions are often seen in the area of the mandibular third molar, and can be mistaken for a dentigerous cyst. When present anteriorly, the OKC can resemble a nasopalatine canal cyst radiographically. Biopsy is imperative, because the histologic appearance of the OKC is the key to diagnosis.[1, 9]

Orthokeratinized odontogenic cysts

The epithelial lining of the OKC is stratified squamous epithelium, six to 10 cells thick. The basal-cell layer has hyperchromatic cuboidal or columnar epithelia. The surface shows parakeratinized epithelium in 83 percent of cysts/tumors.

Pathologists have noted another form of the OKC, termed an *orthokeratinized odontogenic cyst*, which has an orthokeratinized epithelial lining in 10 percent of lesions. (This is in contrast to the more common parakeratinized cyst/tumor.)

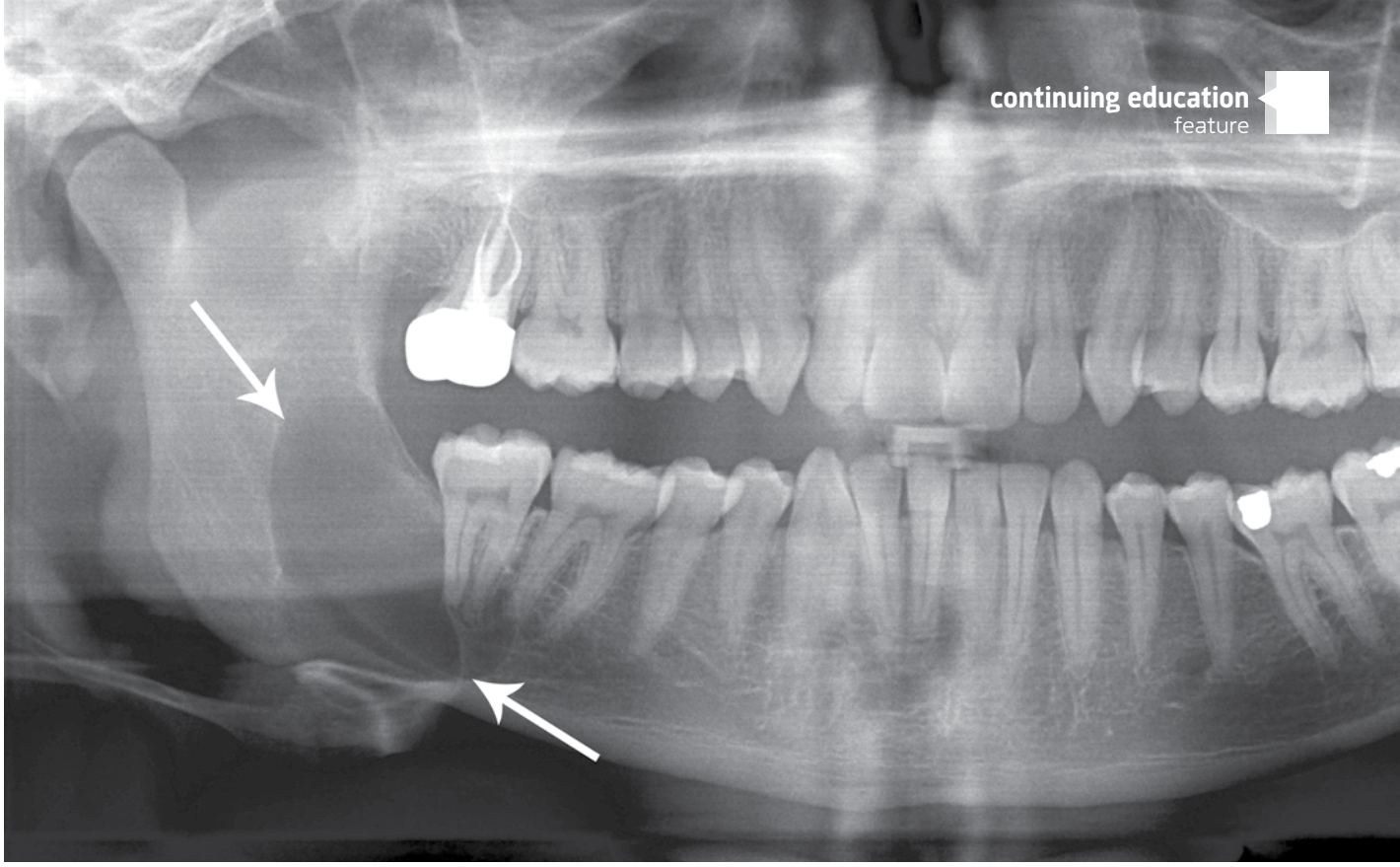

Fig. 3: An odontogenic keratocyst. Photo courtesy of Coronation Dental Specialty Group.

Some oral and maxillofacial pathologists do not differentiate between the parakeratinized and orthokeratinized types; other pathologists have suggested that the orthokeratinized odontogenic cyst be classified as a separate entity.[1, 9]

The orthokeratinized odontogenic cyst variant is more common in young men. It affects the posterior mandible frequently and is much less aggressive—it is not associated with nevoid basal cell carcinoma syndrome. The orthokeratinized odontogenic cyst is similar clinically and radiographically to the parakeratinized form; the primary difference is evident in its histologic appearance. The lining of an orthokeratinized odontogenic cyst is stratified squamous epithelium that is orthokeratinized and can produce keratin. Once again, a biopsy is essential to confirm diagnosis.[1, 7, 9]

Treatment for both types of the lesions is surgery and osseous curettage. Unfortunately, the parakeratinized odontogenic keratocyst has a high rate of recurrence—approximately 30 percent. This is related to its ability to extend into the bone and soft tissue. A lower, 2 percent recurrence rate is noted for the orthokeratinized odontogenic variation. The posterior mandible and ramus are the usual sites of reappearance for both types.

The most common reason for return involves incomplete removal of the original cyst's lining. Also, it may involve the growth of a new lesion from small satellite cysts of odontogenic epithelial rests left behind by the surgical treatment. OKCs may recur within five years of removal; however, a large number may not return until 10 years after the original surgical removal. Careful, diligent long-term evaluation—both clinically and radiographically—is required. It is recommended that all cases should be monitored postoperatively once a year during the patient's lifetime.[1, 6, 7, 9]

Conclusion

Dentists and dental hygienists should be aware of the clinical, radiographic and histological manifestations of these three lesions, which have more in common than first suspected. The odontogenic keratocyst can appear essentially identical radiographically to the dentigerous cyst and the nasopalatine canal cyst, but is a more complicated lesion with aggressive tendencies that can cause significant damage to the mandible or maxilla. ■

References

1. *Neville BW, Damm DD, Allen CA, et al. Oral and maxillofacial pathology. 3rd ed. St. Louis: Saunders Elsevier, 2009. p. 28-31, 678-682, 683-691.*
2. *DiMuzio B, Gaillard F. Dentigerous cyst. Available from: radiopaedia.org/articles/dentigerous-cyst*
3. *Goldman KE, Meyers AD. Mandibular cysts and odontogenic tumors. 2015. Available from: emedicine.medscape.com/article/852734-overview#a2*
4. *Kurnatowski P, Elston DM. Nasopalatine duct cyst. Medscape. 2015. Available from: emedicine.medscape.com/article/1118086-overview#a6*
5. *Odontogenic jaw cysts. Surgical criteria. Standford Medicine. 2014. Available from: surgpathcriteria.stanford.edu/ent/odontogenic-jaw-cysts*
6. *Singh M, Gupta KC. Surgical treatment of odontogenic keratocyst by enucleation. Contemp Clin Dent. 2010; 1(4): 263–267. Available from: ncbi.nlm.nih.gov/pmc/articles/PMC3220151/*
7. *Veena KM, Rao R, Jagadishchandra H, et.al. Odontogenic keratocyst looks can be deceptive, causing endodontic misdiagnosis. Case Reports in Pathology. 2011. Available from: hindawi.com/journals/cripa/2011/159501/*
8. *Madras J, Lapointe H. Keratocystic Odontogenic Tumour: Reclassification of the odontogenic keratocyst from cyst to tumour. JCDA 2008;74(2). Available from: cda-adc.ca/jcda/vol-74/issue-2/165.pdf*
9. *Greer RO, Said MS. Odontogenic keratocyst pathology. 2014. Available from: emedicine.medscape.com/article/1731868-overview*

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1) Which cyst is related to tooth development?
- A) Odontogenic
- B) Nonodontogenic

2) Which cyst is associated with an unerupted and developing tooth?
- A) Dentigerous
- B) Nasopalatine canal
- C) Odontogenic keratocyst

3) A dentigerous cyst is not commonly linked with which tooth?
- A) Permanent mandibular third molar
- B) Permanent mandibular second premolar
- C) Permanent maxillary canine
- D) Primary mandibular second molar

4) The lining of the nasopalatine canal cyst develops from the reduced enamel epithelium.
- A) True
- B) False

5) Which of the following symptoms is not common to the nasopalatine canal cyst?
- A) Swelling
- B) Bone expansion
- C) Discharge
- D) Burning sensation

6) The odontogenic keratocyst is commonly located in the posterior mandible and ramus.
- A) True
- B) False

7) The orthokeratinized odontogenic cyst and the odontogenic keratocyst can be differentiated by which appearance?
- A) Clinical
- B) Radiographic
- C) Histologic

8) Which cyst has the highest rate of recurrence?
- A) Dentigerous
- B) Nasopalatine canal
- C) Parakeratinized odontogenic keratocyst
- D) Orthokeratinized odontogenic cyst

9) Which cyst is most likely to be aggressive?
- A) Dentigerous
- B) Nasopalatine canal
- C) Parakeratinized odontogenic keratocyst
- D) Orthokeratinized odontogenic cyst

10) A heart-shaped radiographic appearance is common to which cyst?
- A) Dentigerous
- B) Nasopalatine canal
- C) Parakeratinized odontogenic keratocyst
- D) Orthokeratinized odontogenic cyst

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Oral Diseases Associated with Men

by Deborah Levin-Goldstein

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