ORIGINAL RESEARCH

A CLINICO-PATHOLOGICAL ANALYSIS OF PATIENTS PRESENTING WITH DENTIGEROUS CYST IN INDORE, MADHYA PRADESH

Divashree Sharma[1], Saurabh Sathe[2], Rajesh Khandelwal[2], Vilas Newaskar[2], Neelam Shakya[2], Bharat Rawat[2]

[1]Department of Dentistry, Shyam Shah Medical College, Rewa, (M.P), [2]Department of Oral and Maxillofacial Surgery, Government College of Dentistry, Indore.

ABSTRACT:
Background: Dentigerous cysts are the most common developmental odontogenic cysts of the jaws and account for approximately 20–24% of the jaw cysts. They mostly surround the crown of unerupted teeth, odontomas or supernumerary teeth. The treatment modalities range from marsupialization to enucleation of the lesion. Materials and methods: A prospective study was done in patients reporting to the department of oral & maxillofacial surgery from June 2012 to December 2013. During the specified period, 14 cases of dentigerous cyst were treated by enucleation and marsupialization. Results: From June 2012 to December 2013, 14 cases of dentigerous cysts were diagnosed. The mean age of occurrence of dentigerous cyst was 23.35 years. Out of 14 cases 5 (35.71%) were females, and 9 (64.29%) were males. The most common site for DC was the mandibular molar region. Conclusion: The most frequent involved site was the posterior region of the mandible and the most commonly associated tooth was the third molar tooth. The cysts had a tendency to displace associated and/or adjacent teeth. Enucleation and marsupialization were successful treatment modalities with no recurrence seen in any of the patients.

Keywords: Dentigerous cyst, impacted tooth, enucleation.

Corresponding Author: Dr. Divashree Sharma, Add: F -7/2, New Doctors' Colony, Arjun Nagar, Rewa: 486001, (M.P). India. Email: divashreesharma@gmail.com

This article may be cited as: Sharma D, Sathe S, Khandelwal R, Newaskar V, Shakya N, Rawat B. A Clinico-Pathological Analysis of Patients Presenting With Dentigerous Cyst in Indore, Madhya Pradesh. J Adv Med Dent Scie Res 2015;3(3):29-33.

INTRODUCTION

A dentigerous cyst is one that encloses the crown of an unerupted tooth by expansion of its follicle, and is attached to its neck.[1] It is the second most common odontogenic cyst after radicular cysts, accounting for approximately 24% of all true cysts in the jaws.[2] They are usually associated with impacted teeth. In some instances they may be associated with supernumerary teeth and odontomas.[3] Dentigerous cysts are often discovered incidentally when radiographs are taken to investigate a failure of tooth to erupt, a missing tooth or mal-alignment.

MATERIALS AND METHODS:

This study was conducted from June 2012 to December 2013 in Department of Oral & Maxillofacial Surgery at Government College of Dentistry, Indore (M.P). A total of 14 cases of dentigerous cyst treated with enucleation or marsupialization during this period were analyzed for age at diagnosis, gender, lesion location, presenting symptoms and treatment outcomes. A pre-operative CT scan/orthopantomogram was done for all patients to determine the extent of the lesion. Enucleation was done in 11 cases and marsupialization in 3 patients. The diagnosis was confirmed with histological analysis of the excised specimen. Regular follow up was done at 1week postoperatively, 1 month, 6 months, 12 months, 18 months and 24 months.

RESULTS

Patient	Age/Gender	Mandible		Maxilla		Tooth associated
		Anterior	Posterior	Anterior	Posterior	
1	23/M		✓			Mandibular 3rd molar
2	28/F			✓		Maxillary canine
3	16/M		✓			Mandibular 3rd molar
4	21/M	✓				Mandibular canine
5	19/M		✓			Mandibular 3rd molar
6	23/F			✓		Maxillary canine
7	27/M		✓			Mandibular 3rd molar
8	22/F				✓	Maxillary 3rd molar
9	28/M	✓				Mandibular canine
10	17/F				✓	Maxillary 2nd premolar
11	36/F	✓				Mandibular canine
12	14/M				✓	Maxillary 1st premolar
13	15/M		✓			Mandibular 3rd molar
14	38/M		✓			Mandibular 3rd molar

CASE 1

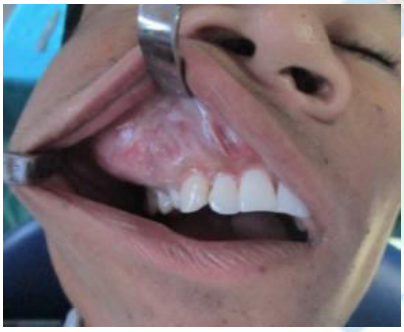

Figure 1: Intraoral photograph showing the expansion of the buccal cortical plate and the obliteration of buccal vestibule by the swelling.

Figure 2: Coronal view of the Computerized Tomography Scan revealing the presence of an impacted tooth in the cystic cavity.

Figure 3: Intra operative view showing the surgical exposure of the lesion.

Figure 4: Enucleation of the cystic lesion en masse.

Figure 5: The aspirated fluid, excised lesion, impacted tooth retrieved from the specimen.

Figure 7: Surgical exposure of the lesion showing impacted tooth inside the cystic cavity

CASE 2

Figure 6: Orthopantomogram revealing a radiolucency attached to 18 .

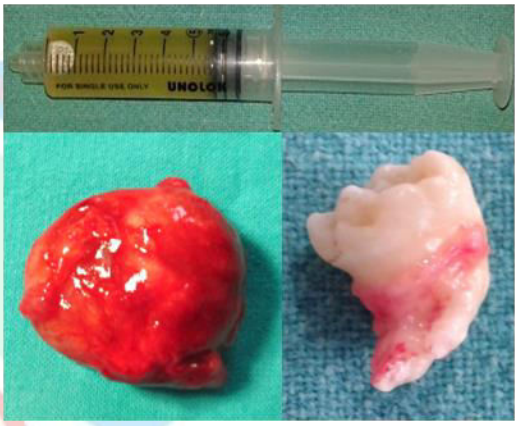

Figure 8: The aspirate and the excised specimen.

Out of 14 patients 5 (35.71%) were females, and 9 (64.29%) were males. Out of the 5 cases seen in maxilla 2(40%) were located in anterior region while remaining 3(60%) were located in posterior region. Out of the 9 cases seen in mandible 3(33.33%) were located in anterior mandible and 6 (66.67%) were in the posterior mandible. Most common tooth associated with lesion was mandibular third molar, which was associated with the lesion in 6(42.85%) cases, mandibular canine in 3 (21.42%), maxillary canine in 2 (14.28%), maxillary third molar, maxillary first and maxillary second premolar tooth in 1 (7.14%) patient each. (Table 1). Swelling was evident in 12 patients (85.71%), pain in 8 patients (57.14%), tooth mobility in 3 patients(21.43%) and pus discharge in 2 patients(14.28%). Tooth displacement was noted in 8 cases and tooth resorption in 5 cases.

Displacement of the floor of the maxillary sinus was seen in two cases and the displacement of the inferior alveolar nerve was also seen in two cases. The patients were followed up at regular intervals. Enucleation was done in 11 cases and marsupialization in 3 patients. The tooth associated with the lesion was removed during enucleation in all cases except in 4 cases where the tooth was allowed to erupt on its own. The minimum follow up was six months for a patient and maximum was 24 months.

DISCUSSION

Dentigerous cyst is most common in second and third decades of age.[4-6] In the study population majority of the dentigerous cysts occurred in third decade of age (50%) followed by 35.71 % in second decade. The mean age was 23.35 years in our study. Similar to male preponderance suggested in other

studies, males were predominantly involved with a male: female ratio of 1.8:1.[1, 2, 4]

Dentigerous cyst is most commonly associated with mandibular third molars followed by maxillary canines, mandibular second premolars and maxillary third molars in decreasing order of frequency.[2] In our study the most common site for occurrence of dentigerous cyst was the mandibular molar region and the most frequently involved tooth was the mandibular third molar (42.85%) which was in accordance with other studies.[5,7]

Since majority of these cysts are asymptomatic they are frequently discovered as an incidental finding on radiographs when these are taken because a tooth has failed to erupt or a tooth is missing, or because teeth are not aligned.[8] Patients may also notice them because of appearance of slowly enlarging swellings. The exact pathogenesis is not known however most authors favour a developmental origin related to the developmental crypt that surrounds the crown of an unerupted tooth of a normal or a supernumerary dentition.[9]

It is proposed that dentigerous cyst arises from pooling of inflammatory exudate, which is derived from the obstructed follicular veins of an unerupted tooth and accumulates between the reduced enamel epithelium and the crown of the tooth. It enlarges by unicentric expansion from the hydrostatic pressure of its contents.[10,11] It may also occur due to fluid accumulation between the layers of the enamel organ.[11] Another theory proposes that degeneration of stellate reticulum at an early stage of tooth development results into formation of a cyst associated with enamel hypoplasia.[12]

An inflammatory origin has also been suggested. It has been reported that inflammation progressing from the root apex of the deciduous tooth brings about development of the dentigerous cyst around the unerupted permanent tooth.[13] The cyst may cause expansion of buccal cortex, teeth displacement, tooth mobility and sensitivity, if it reaches a size larger than 2 cm in diameter.[14] Radiographically, it appears as a a unilocular well circumscribed, symmetric radiolucency with sclerotic borders surrounding the crown of a non- erupting or partially erupted tooth.[8] Three variants of dentigerous cysts namely central, lateral and circumferential have been described. In the central variety the crown is enveloped symmetrically. The dilatation of the follicle on one aspect of the crown results in lateral variety of the cyst. In a circumferential dentigerous cyst the entire tooth appears to be enveloped by the cyst.[1] A large dentigerous cyst may appear as multilocular owing to the persistence of bone trabeculae within the radiolucency.[15]

In the non-inflamed dentigerous cyst, a 2-4 cell layer thick primitive type of thin epithelial lining of cuboidal or low columnar cells may be present. The fibrous connective tissue wall consists of loose connective tissue stroma which is rich in acid mucopolysaccharides. Retepegs formation is absent except in cases that are secondarily infected. In the inflamed dentigerous cyst, the fibrous cyst wall shows an inflammatory infiltrate.

They are usually solitary; multiple dentigerous cysts have been observed in patients with certain syndromes, such as mucopolysaccharidosis type VI and basal cell nevus syndrome, Gardner's syndrome and Cleidocranial dysplasia.[16]

The differential diagnosis of a dentigerous cyst includes radicular cyst, odontogenic keratocyst, central giant-cell granuloma, pindborg tumor, cementoma, odontome and unicystic ameloblastoma.

Enucleation and marsupialization are two treatment modalities indicated. Three cases of large cysts in proximity to vital structures, were treated by marsupialization. In this study cyst enucleation along with extraction of the impacted tooth was done for cases when the impacted teeth were found unlikely to be useful, or lacked space for eruption. Cyst enucleation with preservation of the impacted tooth was done in four cases when the tooth was likely to erupt into its normal functional position when root formation is complete. All the four teeth erupted to their functional position either on their own or with orthodontic treatment. The prognosis of both the treatment modalities was good, with no recurrence seen in any of the cases.

Untreated dentigerous cyst may proceed to become a mural ameloblastoma, mucoepidermoid carcinoma and rarely into a squamous cell carcinoma in worst scenario. No such transformation was reported in this study.

REFERENCES

1. Shear M, Speight P: Cysts of the Oral and Maxillofacial Regions. 4th Edn.; Blackwell Publishing Ltd., 2007:pp59- 78.
2. Daley TD, Wysocki GP, Pringle GA: Relative incidence of odontogenic tumors and oral and

jaw cysts in a Canadian population. Oral Surg Oral Med Oral Pathol 1994, 77:276-280.
3. Taylor AM, Camacho ME, Franco MA, Tejero MA. Odontogenic cysts. Analysis of 856 cases. Med Oral 2002;7:89-96.
4. Neville BW, Damm DD, Allen DD, Bouquot JE. Odontogenic cysts and tumors. In: Neville BW, Damm DD, Allen DD, Bouquot JE, editors. Oral and Maxillofacial Pathology. 3rd ed. St. Louis: Saunders Elsevier; 2009. p. 678-740.
5. Zhang LL, Yang R, Zhang L, Li W, MacDonald-Jankowski D, Poh CF. Dentigerous cyst: A retrospective clinicopathological analysis of 2082 dentigerous cysts in British Columbia, Canada. Int J Oral Maxillofac Surg 2010;39:878-82.
6. Ramesh G, Dave A, Singh KD, Nagarajappa R.Dentigerous Cyst Involving Multiple Teeth in Non Syndromic Patients and Cholesterol Granuloma - A Review. International Journal of Oral & Maxillofacial Pathology. 2010;1(1):13-16
7. Lin HP, Wang YP, Chen HM, Cheng SJ, Sun A, Chiang CP. A clinicopathological study of 338 dentigerous cysts. J Oral Pathol Med. 2013 Jul;42(6):462-7.
8. White SC, Pharoah MJ: Cysts and cystlike lesions of the jaws. In Oral Radiology: Principles and Interpretation.. 6 edition. Edited by: White SC, Pharoah MJ. St Louis, MO: Mosby Elsevier; 2009:346-350.
9. Benn A, Altini M. Dentigerous cysts of inflammatory origin. A clinicopathologic study. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1996;81:203-9.
10. Browne RM.The pathogenesis of odontogenic cysts: a review. J Oral Pathol. 1975 Jul;4(1):31-46.
11. Main DM. The enlargement of epithelial jaw cyst. Odontol Revy 1970;21:21-9.
12. Al-Talabani NG, Smith CJ: Experimental dentigerous cysts and enamel hypoplasia: their possible significance in explaining the pathogenesis of human dentigerous cysts. Journal of Oral Pathology, 1980; 9: 82–91.
13. Narang RS, Manchanda AS, Arora P, Randhawa K. Dentigerous cyst of inflammatory origin -A diagnostic dilemma. Ann Diagn Pathol. 2012;16(2):119-23.
14. Bodner L, Woldenberg Y, Bar-Ziv J. Radiographic features of large cysts lesion of jaws in children. Pediatr Radiol 2003;33:3-6.
15. Shafer, Hine, Levy; Shafer 's Textbook of Oral Pathology, 6th Ed., 2009,254-258.
16. Ustuner E, Fitoz S, Atasoy C, Erden I, Akyar S. Bilateral maxillary dentigerous cysts. A case report. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2003;95:632–5.
17. Kirtaniya BC, Sachdev V, Singla A, Sharma AK. Marsupialization: a conservative approach for treating dentigerous cyst in children in the mixed dentition. J Indian Soc Pedod Prev Dent. 2010;28(3):203-8.

Source of support: Nil

Conflict of interest: None declared