ORIGINAL ARTICLE

PATTERN AND MANAGEMENT OF CYSTS AND TUMORS AROUND IMPACTED TEETH

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ABSTRACT

The objective of this study was to see the association of pathologies with impacted teeth and their early management.The study was conducted at a secondary care hospital, Ministry of Health, Riyadh, Saudi Arabia from August 2016 to April 2018. Assessment was done with detailed history, clinical and radiographic examination. Initial radiographs were periapical, orthopantomogram, paranasal sinus view and occlusal view. CT scan and other investigations were advised as per requirement. All pathological samples were sent for histopathological evaluation after surgical excision. A total of 576 panoramic radiographs for impacted teeth were studied and recorded. Only 38 (6.60%) impacted / un-erupted teeth had associated cysts or tumors. Out of 38 lesions, 73.68% were associated with third molars,18.42% with premolars and 7.90% were related with canines. Male to female ratio was 1.8:1. The patient age ranged from 15 to 45 years, with a mean of 25.55+ 7.08 years. Patients between age 15-25 years (mean 21.48+2.6) were the most frequently affected followed by patients between 26 to 35 years (31.09+ 3.08).The most common pathology in the mandible was dentigerous cyst followed by Keratocystic odontogenic tumor while adenomatoid odontogenic tumor was observed commonly on maxillary anterior region during growing age. It can be concluded that maximum number of pathologies are seen in impacted molars (73.70%).Among these pathologies dentigerous cyst was most common(44.73%) followed by odontogenic cyst (28.94%).The most prevalent age range for pathologies was from 15 -25years.Early management can save many vital structures and prevent serious complications. On the basis of our current study, we recommend that early diagnosis and management of impacted teeth is very important to prevent late complications, so regular monitoring of impacted teeth is indicated.

Key Words: *Impacted third molars, unerupted teeth , pathologies , dentigerous cyst, odontogenic keratocyst.*

INTRODUCTION

Tooth impaction is a pathological condition in which a tooth fails to erupt into its normal functional position within the expected time due to many local and systemic factors.[1,2] Third molar is the most common impacted tooth in the oral cavity.[3] Internationally, prevalence for impacted mandibular third molar varies between 16.7% and 68.6%, respectively[4,5] followed by the maxillary third molars, maxillary canines, mandibular premolars and mandibular incisors.[6] Multiple systemic factors contribute in the impaction of teeth which include cleidocranial dysplasia, endocrine deficiency, febrile disease, down syndrome, gardner's syndrome whereas local factors include prolonged deciduous teeth retention or early loss, malposed tooth germs, arch length deficiency, supernumerary teeth, trauma, odontogenic tumors and cleft lip and palate may influence impaction of permanent teeth.[7,8]

Impacted teeth may lead to common complications like carious lesions of the impacted or adjacent tooth, periapical infection, periodontal disease and pathology like cyst and tumor.[9] Common odontogenic cysts and tumors include dentigerous cyst, calcifying odontogenic cyst, ameloblastoma, adenomatoid odontogenic tumor, odontogenic keratocyst, calcifying epithelial odontogenic tumor, and odontoma.[10] Review of literature states that cystic or neoplastic lesions are seen in 16% of impacted teeth and is most common finding

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during the second and third decades of life.[11] The most frequent lesion associated with impacted teeth is the dentigerous cyst.[12]

In past, a pericoronal radiolucency was considered as non pathologic if it was smaller than 2.5 mm in width. But recent data shows presence of pathologies in impacted teeth having pericoronal radiolucency less than 2.5 mm.[13] Statistical data regarding presence of cysts and tumors varies in Saudi Arabia, according to the study conducted by Subhashraj et al,[14] in a group of population of Saudi Arabia, concluded that a significant proportion of Saudis with impacted third molars develops pathologies and stated that approximately there were 7.7% periapical radiolucency and 5.6 % pericoronal radiolucency in his study. Another study by Ahmad et al[15] concluded that the prevalence of impacted teeth was high, and there was a predominant for impaction of the mandibular third molars in this study of Al Ahsa Saudi population. Secondarily caries and periodontal disease were commonly associated with the impacted third molars, whereas root resorption and cystic pathology were rarely observed.

The incidence of cysts and tumors reported in literature is low as compared to actual figures as some times pathologies go unnoticed as many clinicians don't send specimens for histopathological examination after surgical removal of the tooth and pathology.[16] Treatment options for jaw tumors and cysts vary, depending on the symptoms, the type and extent of the lesion. They usually require surgical management because if they remain untreated can cause severe complications causing malignant transformation of cystic wall into squamous cell carcinoma or mucoepidermoid carcinoma.[17]

Surgical treatment of odontogenic cysts and tumors varies from marsupialization to surgical resection. Enucleation gives very good prognosis for the treatment of dentigerous cyst, calcifying epithelial odontogenic tumor. Keratocystic odontogenic and ameloblastoma are preferably treated with surgical excision and resection, although marsuplization is a recommended option to save the vital structures in case of OKC. Adenotmaoid odontogenic tumors need surgical management with enucleation followed by currattage. Impacted and displaced teeth should be removed in all these options.[18,19]Asymptomatic impacted or unerupted teeth associated pathologies run pain free and are diagnosed late, resulting in damage of vital structures like teeth and surrounding bone. There is need to diagnose and manage these lesions as soon as possible. Many studies have been conducted in Saudi Arabia to see the prevelance and pattern of impacted teeth , but very less literature is available to see the prevelance of pathologies with impacted teeth. Thus, this study was conducted to see the association of cysts and tumors with impacted teeth and their early management.

MATERIAL AND METHODS

This study was conducted at a secondary care hospital, Ministry of Health, Riyadh, Saudi Arabia from August 2016 to April 2018, after approval of hospital ethical review committee. Patients presenting with the complaint of pain, swelling, limited mouth opening, sensitivity, soft tissue swelling around the impacted/ unerupted teeth were examined and investigated. All the patients underwent clinical and radiographic assessment. All impacted molars were classified according to Pell and Gragory classification 20 whereas for premolars and canines classification given by Yamamoto21 was used. Initial radiographs included periapical, orthopantomogram, paranasal sinus view and occlusal view. Cone beam CT or CT scans were advised if required. All patients presented with impacted teeth were included in the study regardless of age. All syndromic patients were not included in the study. Incisional or excisional biopsy was taken in same hospital under local or general anesthesia and samples were sent to laboratory for definitive diagnosis. Marsuplization, enucleation , currattage and surgical resection were the surgical treatment options in these patients. All data was collected and entered in SPS version 16 to analyze the data by using Chi Square test. The data was presented as proportions.

RESULTS

A total of 576 panoramic radiographs taken for impacted teeth were studied .These 576 symptomatic patients presented with different chief complaints which included pain, decreased mouth opening, painless or painful swelling sensitivity and gum enlargements. Among 576 patients, only 38 (6.60%), impacted / un-erupted teeth were associated with cysts or tumors (Figure 1). Out of 38 lesions, 28 (73.7%) were associated with third molars, 7 (18.4 %) with premolars and 3 (7.9%) with canines (P=.001) [Table1].

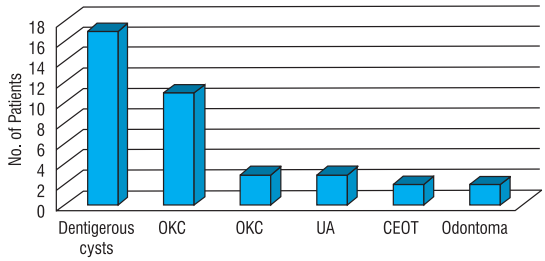
Male to female ratio was 1.8 to 1. The overall patient age ranged from 15 to 45 years, with a mean age of 25.55+ 7.08 years. The 15-25 years age group (22.48+1.6) had the highest prevalence of tooth impactions (65.78%) followed by 28.94% of patients which aged between 26 to 35 years (31.09+ 3.08) and than those age 36 to 45 years (43.5+ 2.12)were only 5.26%.

Most common pathology in the mandible was dentigerous cyst followed by Keratocystic odontogenic tumor while adenomatoid odontogenic tumor was observed more commonly in maxillary anterior region (Figure 2). Radiographs like periapical view, orthopantomogram, paranasal sinus view and occlusal view were helpful as initial investigaton(Figure 3). Marsupialization was

TABLE 1: DISTRIBUTION OF PATHOLOGIES WITH IMPACTED TEETH

Total Pathologies (n = 38)	Impacted / Unerupted Molars (n = 28)	Impacted / Unerupted Premolars (n = 07)	Impacted / Unerupted Canines (n = 03)
Dentigerous Cyst (n= 17)	14	03	-
OKC (n= 11)	8	03	-
AOT (n= 03)	1	-	2
UA (n= 03)	3	-	-
CEOT (n= 02)	2	-	-
Odontoma (n= 02)	-	1	1

OKC: Odontogenic Keratocyst, AOT: Adenomatoid Odontogenic tumor, UA: Unicystic Ameloblastoma, CEOT: Calcifying Epithelial Odontogenic Tumor.



OKC: Odontogenic Keratocyst, AOT: Adenomatoid Odontogenic tumor, UA: Unicystic Ameloblastoma, CEOT: Calcifying Epithelial Odontogenic Tumor.

Fig 1: Distribution of odontogenic pathologies associated with impacted and unerupted teeth

Fig 2: Six years male patient with painless swelling at right maxillary sulcus.

Fig 3: Para nasal sinus view shows well defined radiolucent lesion with unerupted displaced tooth toward right nasal cavity.

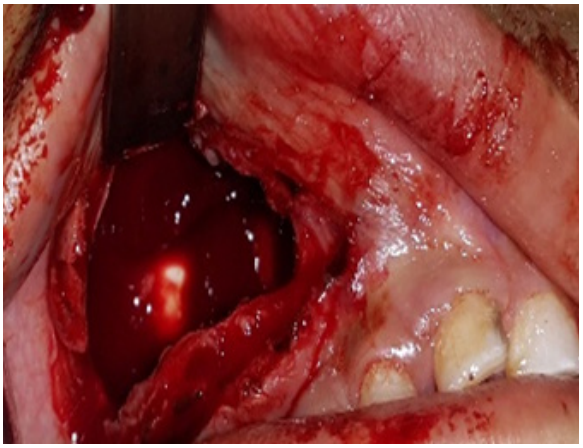


Fig 4: Tooth partially visible during enucleation

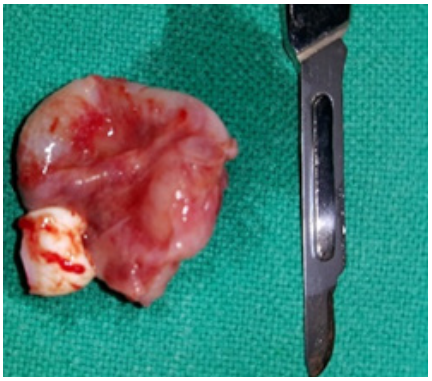


Fig 5: Excisional biopsy done along with involved tooth. Histopathological evaluation later showed adenomatoid odontogenic tumor

done in 4 (10.52%) patients, while 24 (63.12%) patients were treated with enucleation. Surgical resection was carried out in 6 (15.79%) patients whereas enucleation with currattage remained treatment of choice in 4 (10.52%) patients. Very good prognosis was achieved with enucleation followed by currattage in case of adenomatoid odontogenic tumor during mixed dentition period (Figure4). All pathological samples were sent for histopathological evaluation (Figure5).

DISCUSSION

Impacted teeth may remain asymptomatic for long period of time, and there is possibility that they become symptomatic due to various pathologies such as caries, pericoronitis, cysts, tumors, and root resorption. There are various studies in literature supporting the evidence that number of complications including cysts and tumors are seen with impacted teeth[22].

In current study the most common pathology found with impacted teeth was dentigerous cyst 17 (44.7%). The cysts and tumors were more common in female than males (2:1) and in patients between 15 to 25 years of age and these findings are in agreement with findings of Patil et al.[23] Enucleation of the these dentigerous cysts were carried out with preservation of lower border. Autogenous bone grafts and hydroxyapatite crystals were used to fill up the dead space created after enucleation. This treatment is in accordance with Carrera et al[24] work , as they also concluded in their study that treatment of dentigerous cyst through conservative therapy is preferable in children. Marsupialization and decompression may represent the treatment of choice, but they are also useful prior to extensive enucleation or curettage.

Second most common pathology associated with impacted teeth in our study was odontogenic keratocyst (OKC) . It was also observed that OKC was more dominantly associated in mandibular molars followed by mandibular premolar which is in line with the study of Planinić et al.[25] In current study marsuplization was done in some patients (n = 4) to save the vital structures like Inferior alveolar nerve and lower border of the mandible in cases of OKC. Few patients (n=6) were operated through resection followed by odogenous bone graft which is in accordance with de Molon[26] et al work, as he also used marsupialization technique followed by enucleation for the treatment of OKCs was an effective and conservative approach , enabling the reduction of the initial lesion, the preservation of anatomical structures and teeth and allowing quicker return to function.

Ameloblastoma (n=3) was third most common condition associated with impacted/ unerupted teeth. The most common site was the mandibular posterior region. It was treated by surgical excision followed by reconstruction by recon plates and autogenous bone graft. Reconstruction plate was applied where condylar stump was not involved in the lesion and to further reconstruction with autogenously bone graft was delayed. Laxmidevi[27] also stated that Ameloblastoma is one of the common odontogenic tumor associated with impacted teeth. He noted that on radiograph it is difficult to differentiate between unicystic ameloblastoma and dentigerous cyst and this similarity may result in enucleation of the tumor. Ceylan[28] also concluded in his study that optimal treatment of ameloblastomas consists of wide surgical resection. Dentigerous cysts usually are treated with enucleation and curettage, whereas the preferred treatment of keratocystic odontogenic tumors is enucleation with wide bone margins and marsupialization because of their aggressive growth, multiplicity, and likelihood of recurrence with more conservative treatment .

In our study Adenomatoid Odontogenic Tumor (AOT) was common presentation in the anterior maxilla due to impacted canines (65%) and premolar (35%). AOT was found in 0.5% of impacted/ unerupted teeth. It was lower than that (1.2%) reported in caucasians.[29] The AOT is over two times more located in the maxilla than in the mandible and the anterior area is much more affected than the posterior area.[30]In our study surgical currattage along with removal of involved teeth was done. Prosthetic appliance was applied temporarily and reconstruction was delayed till final postoperative visit. According to Handschel[31], AOT is a rare odontogenic tumor and most cases are associated with an uneruppted permanent tooth. Treatment is conservative and the prognosis is excellent.

Results of current investigations show that impactions of molar, premolar and canines are commonly discovered dental anomaly that usually remains unnoticed by the patients unless some symptoms appear. The early recognition of pathological conditions associated with impaction/uneruption during or after growing age is very important for making early management. As shown in present study, impacted teeth may result in many serious complications like odontogenic cysts and odontogenic tumors so early detection can save several anatomical vital structures present in close proximity of these teeth. It is concluded that regular checkups and radiographic assessment should be carried out if there are any impacted/ unerupted teeth in oral cavity, especially in young age group so that if any pathological condition is present, should be managed earlier.

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