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Incidence of Cysts and Tumours Associated with Impacted Mandibular Third Molar: A Retrospective Study.

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ABSTRACT

Background: Tooth impaction is a common occurrence and surgical removal of impacted teeth is the commonest of routine dental surgical procedures. Various pathological conditions like cysts, tumors, abscess etc. have been associated with partially or completely unerupted tooth. Aim: To determine the histopathological incidence of cysts and tumours associated with impacted mandibular third molar. **Methods**: A retrospective study was conducted on 85 formalin-fixed, paraffin-embedded tissue blocks, including 85 cases of impacted mandibular third molars associated with pathologies which are histopathologically diagnosed using H & E staining. After data collection, statistical analysis was done. **Results**: In our study, dentigerous cyst have the highest incidence (22.35%) followed by ameloblastoma (14.11%), odontogenic keratocyst (9.4%) and calcifying cystic odontogenic tumour (2.35%). **Conclusion**: Follicular tissue was obtained from extraction of impacted teeth should be sent for a histopathologic investigation and attention should be focused on age, gender, site and type of impaction for the treatment planning of an impacted third molar.

Keywords: Dentigerous cyst, Plexiform ameloblastoma, Unicystic ameloblastoma, Calcifying cystic odontogenic tumour, Odontogenic keratocyst.

INTRODUCTION

Impacted tooth is a tooth that was prevented from erupting into the correct position due to lack of space, malposition etc. In other words, impacted tooth are those that failed to erupt into the dental arch within the expected time frame.[1,2] Third molar is the most common impacted tooth; accounts for approximately 98% of all impacted teeth and various studies have proposed that about one-third of the completely unerupted and partially erupted mandibular third molars are known to be related with pathological conditions.[3,4]

Several studies have suggested that the advantage for the prophylactic extraction of impacted mandibular third molars remain controversial but various complications may occur due to surgical extraction like nerve damage,[5] infection, impairment of healing socket in older patients, trismus, damage to adjacent teeth etc.[6] Several indications for the therapeutic extraction of impacted third molars are recurrent pericornitis, cysts, non-restorable carious lesions, cellulitis, osteomyelitis, periapical pathology, tooth fracture and a tooth which is involved in or within the tumour resection.[7]

The process of cyst or neoplasm formation in association with completely unerupted or partially erupted mandibular third molars is related to the structural components of the follicle i.e. the reduced enamel epithelium and remnants of the dental lamina located in the connective tissue wall.[8] The incidence of cysts and tumours around the impacted mandibular third molar was seems to be low and it varies from 2 to 6.2%.[9,10] These pathological conditions are related with pericoronal follicle and can be determined by radiograph that indicates an enlargement of the pericoronal space.[6] After radiographic diagnosis, confirmation can be done by the making the histopathology of follicular tissue. The aim of the present study was to determine the histopathological incidence of cysts and tumours associated with impacted mandibular third molar.

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MATERIALS AND METHODS

A retrospective study was carried out on eighty-five histopathologically proven cases associated with impacted mandibular third molar, were

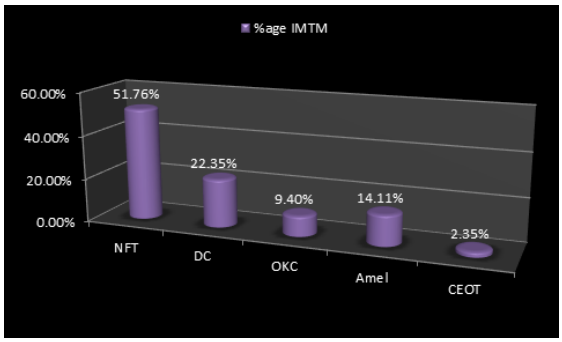
retrieved from the archives of Department of oral and maxillofacial pathology. From each paraffin embedded tissue block, serial section of 4-5µm thickness were cut using a semiautomatic rotary microtome and stained it with H & E (Hematoxylin and Eosin) staining. After staining, all the sections were mounted with DPX and analysed under the microscope at 4X, 10X and 40X. All the data were observed and analysed with the help of statistical software (SPSS 20).

RESULTS

The age of the patients in this study ranged from 17-35 years with a mean age of 23.95years and majority of the patients were males (67%).

In this study, 44 cases (51.76%) revealed normal follicular tissue, 19 cases (22.35%) showed dentigerous cyst, 8 cases (9.4%) presented as odontogenic keratocyst, 12 cases (14.11%) showed ameloblastoma and 2 cases (2.35%) revealed calcifying epithelium odontogenic tumor (Graph1).

In the present study, 8 cases (9.4%), 3 cases (3.53%) and 1 case (1.18%) were found to be unicystic ameloblastoma, follicular ameloblastoma and plexiform ameloblastoma respectively.



Graph 1: Graph showing incidence of cysts and tumours associated with impacted mandibular third molar (IMTM- Impacted mandibular third molar, NFT- Normal follicular tissue, DC- Dentigerous cyst, OKC- odontogenic keratocyst, Amel- Ameloblastoma and CEOT- Calcifying epithelial odontogenic tumour)

In this study, normal follicular tissue appears as reduced enamel epithelium without well-formed squamous epithelium under the microscope [Figure 1A] and those with cystic lumen lined by continuous stratified squamous epithelium of three to four cells in thickness were considered as a dentigerous cyst [Figure 1B]. OKC appears as cystic lumen lined by keratinised, stratified squamous epithelium which is about 5-7 layers thick and without rete ridges [Figure 1C]. In unicystic ameloblastoma, the cystic lumen is lined by ameloblastic epithelium revealing a hyperchromatic and polarized basal layer. Above the basal layer, the epithelial cells are loosely cohesive resembling stellate reticulum like cells [Figure 1D]. Plexiform ameloblastoma appears as anastomosing cord of odontogenic epithelium which is bounded by ameloblast like cells surrounding more loosely arranged epithelial cells [Figure 1E]. In follicular ameloblastoma, follicles of odontogenic epithelium showing peripheral columnar differentiation with reverse polarization and central mass of polyhedral loosely arranged cells resembling stellate reticulum like cells [Figure 1F]. In CEOT (calcifying epithelial odontogenic tumour), sheets of polyhedral tumour cells that are surrounded by a pool of amorphous, eosinophilic amyloid like material [Figure 1G].

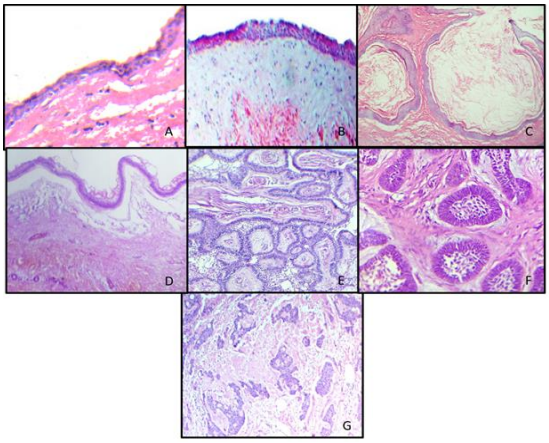


Figure 1: Histopathological presentation of A) Normal follicular tissue, B) Dentigerous cyst, C) Odontogenic keratocyst, D) Unicystic ameloblastoma, E) Plexiform ameloblastoma, F) Follicular ameloblastoma G) Calcifying epithelial odontogenic tumour

DISCUSSION

Impacted third molars account for approximately 98% of all impacted teeth and the surgical removal of these teeth are carried out in routine dental practice.[3] The various indications for the prophylactic removal of third molar are to prevent the crowding of teeth, minimize the chances of development of cysts and tumours, to prevent the root resorption of adjacent teeth and surgery become difficult with age etc. Another important indication for the asymptomatic removal of impacted third molar is the enlargement of the size of the pericoronal radiolucency. In presence of pathological changes associated with impaction like cysts, tumours, destruction of adjacent teeth, non-restorable carious lesion, there is no disagreement for tooth extraction.[11,12]

The incidence of cysts and tumours present around the impacted third molar varies greatly in various studies but in our study, dentigerous cyst have the highest incidence (22.35%) followed by ameloblastoma (14.11%), odontogenic keratocyst (9.4%) and calcifying cystic odontogenic tumour (2.35%).

A study carried out by Vigneswaran and Shilpa,[13] found that the incidence of dentigerous cyst, OKC and ameloblastoma associated with impacted third molar was 24%, 14.3% and 15.7 respectively. According to Regezi et al,[14] Shear and Singh,[15] and Weir et al,[16] the incidence of ameloblastoma associated with impacted third molar was found to be 0.14%, 2% and 0.41% respectively. A study done by Shin et al,[17] who reported that 76.4%, 17.6% and 5.71% showed dentigerous cyst, OKC and ameloblastoma.

Numerous theories have been proposed to elucidate the development of odontogenic cysts like dentigerous cysts and OKC. One proposes that long-standing inflammation results in cystic lesions while another suggests the role of mutations of specific genes.[18,19] According to these theories, the greater incidence of cysts or tumors in older age groups may be as a result of persistent long-standing inflammatory processes or the possible accumulation of genetic mutations.

CONCLUSION

The incidence of various cysts and tumours has been reported in our study. Patient with impacted third molar require careful evaluation of the patient and the decision to remove prophylactically should depend on the balance between the possibilities of impacted third molar and the risks or advantages of surgery. All the cases of impacted third molars should be subjected to radiographic follow up and any follicular tissue found from extraction of impacted teeth should be sent for a histopathologic investigation and attention should be focused on age, gender, site and type of impaction for the treatment planning of an impacted third molar.

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