EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 5
Issue: 2
359-364
Year: 2018

THE SIGNIFICANCE OF IDENTIFYING HISTOPATHOLOGIC CHANGES IN SOFT TISSUE ASSOCIATED WITH IMPACTED THIRD MOLARS: A DESCRIPTIVE STUDY

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Article Received on 22/11/2017 **Article Revised on 13/12/2017** **Article Accepted on 03/01/2018**

ABSTRACT
Aim: Treatment choices about third molar have important clinical and cost implications. There is hardly any standard protocol that is available for treatment decisions of asymptomatic impacted third molars. The aim of the present study was to find out the incidence and histopathological alterations in follicular tissues associated with impacted third molars **Methodology:** Histopathological evaluation of follicular tissue surrounding impacted teeth was carried out in 145 cases from the 185 study sample. **Results:** The commonest alterations seen were proliferation of reduced enamel like epithelium (23%), 43% of the cases showed cyst like changes and 7% of the tissues revealed neoplastic changes in odontogenic epithelium. **Conclusion:** The findings of this study suggest that a high rate of pathosis was found on histopathological examination of the follicular tissue suggesting longer an impacted tooth exists, the greater the risk of development of neoplasms.

KEY WORDS: Dental follicle, impacted teeth, Odontogenic cyst.

INTRODUCTION
Treatment decision making is mostly an instinctive process in which inexactness and inconsistency between practitioners are universal problems. Accordingly, treatment decisions are mainly based on practice interpretations and experience of the clinician[1]. Removal of impacted (3rd molar) is a common procedure performed in oral surgery. Although indications for its removal have generated much discussion in recent days, but still there is no standard protocol for removal of asymptomatic impacted third molar[2]. Several recent studies have demonstrated significant changes in cases with clinically normal radiolucency. These recent studies have indicated that the incidence of pathosis in follicular tissues is higher than generally observed from radiographic examination alone[3].

Other than its important role in eruption physiology, studies have reported that the dental follicle (DF) may undergo metaplastic changes leading to cystic degeneration and/or neoplastic transformation. The DF appears radiographically as a pericoronal radiolucency, the width of which is of the utmost importance in identifying DF pathology[4]. A pericoronal space more than 2.5 mm on an intraoral radiograph and more than 3 mm on a panoramic radiograph should be regarded as suspicious of pathosis[5].

Clinical studies reported by the US national institute of health indicated that 1.5 to 13.3% of third molars were removed primarily due to cyst formation[6]. This study was carried out with the aim to evaluate the tissue lining the impacted teeth, which were otherwise asymptomatic.

MATERIAL AND METHODS
The study commenced after the ethics committee approval was taken. 180 samples were collected from participants who came for disimpaction in the department of Oral and Maxillo Facial Surgery, K M

Shah Dental College and Hospital, Vadodara. During disimpaction the soft tissue surrounding the embedded third molar was removed. Further specimens were fixed in 10% neutral buffered formalin, dehydrated in alcohol, cleared in xylene and embedded in paraffin. About 4µ thick sections were obtained by a semi-automatic microtome YSI060 and the sections were stained with routine Hematoxylin and Eosin stain. After mounting with cover slips the slides were viewed under microscope Labomed vision 2000.

Out of 180 samples 145 slides were included in the study. The slides were independently observed by two observers to avoid bias. The following microscopic parameters were recorded for each case: absence or presence of epithelium and its type squamous, cuboidal and columnar, connective tissue pattern fibrous, myxomatous or both, presence of odontogenic epithelial rests and calcifications, chronic nonspecific inflammation, and existence of other cystic or neoplastic lesions. Diagnosis was registered only when both pathologists results were in concordance while in case with inconsistent outcomes, a consensus diagnosis were arrived at after joint review.

RESULTS

The soft tissue specimens submitted for histopathological examination were with age ranging from 17-30 years. Out of the 145 soft tissue specimens examined, 43%showed cystic change and 7 % has the neoplastic change other than inflammation.

Out of these 6 (6.7%) follicles showed Odontogenic keratocyst (Figure 1), one (1.1%) follicle showed calcifying epithelial odontogenic tumor like changes (Figure 2), one follicle (1.1%) showed odontogenic fibromatous changes.

Amongst the follicular tissues in which histological alterations were observed, the commonest alterations were proliferation of reduced enamel like epithelium (23%), hyperplastic odontogenic epithelium (17%), neoplastic changes (4.8%) and presence of odontogenic islands in the form of nests, cords, clusters & rows in the connective tissue stroma (Graph 2). Other than these changes 69% of follicles showed bony spicules in the deeper connective stroma and 21% granulomatous changes with areas of degeneration.

LEGENDS

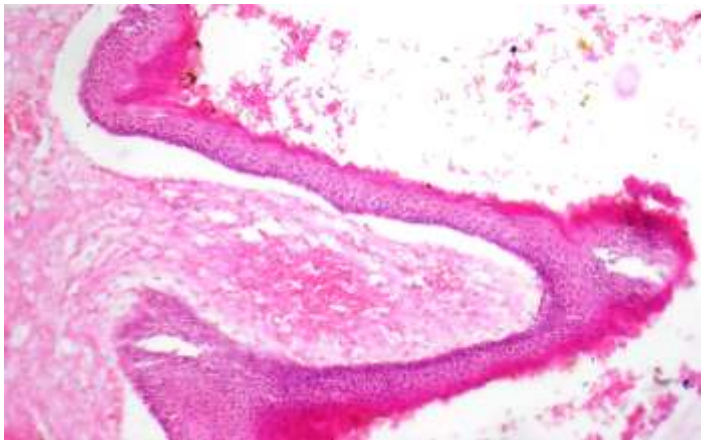


Figure 1: H&E stain sectioned photomicrograph (20x) of OKC showing stratified squamous epithelium with areas of focal thickening and corrugated parakeratin surface with hyperchromatic basal cell layer.

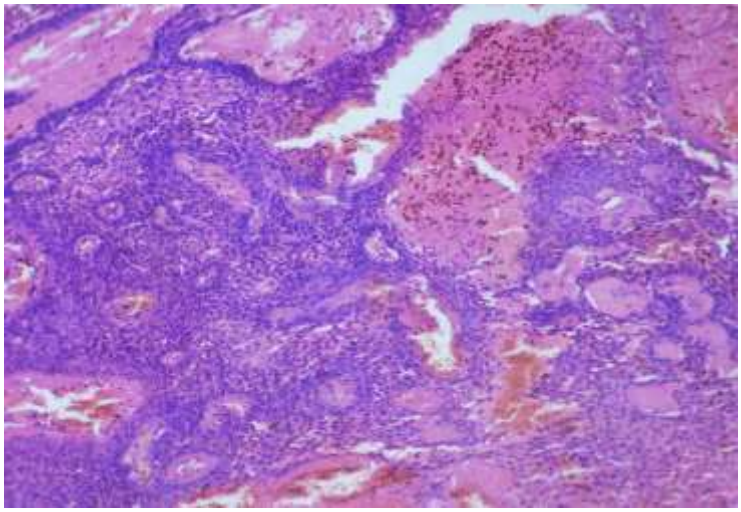
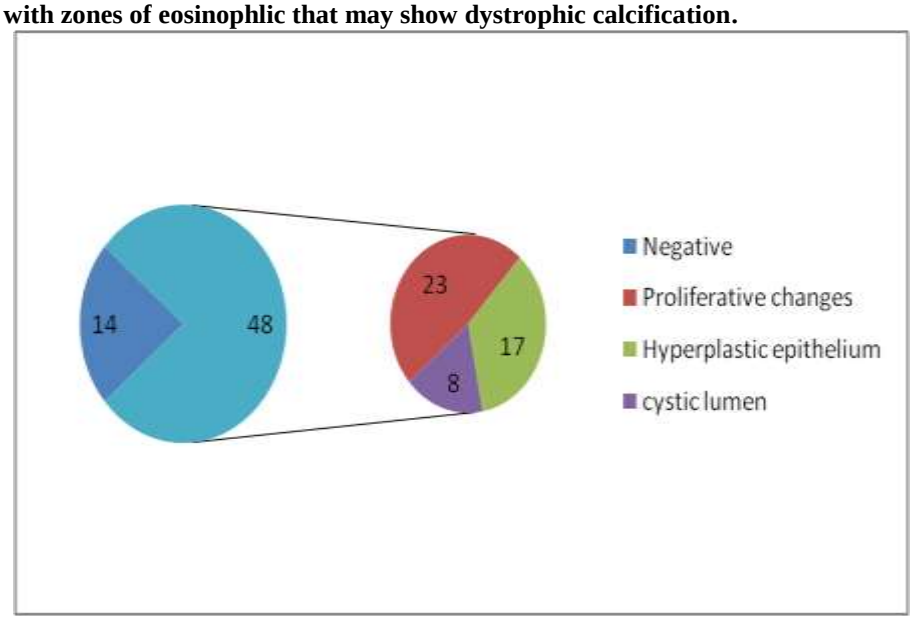
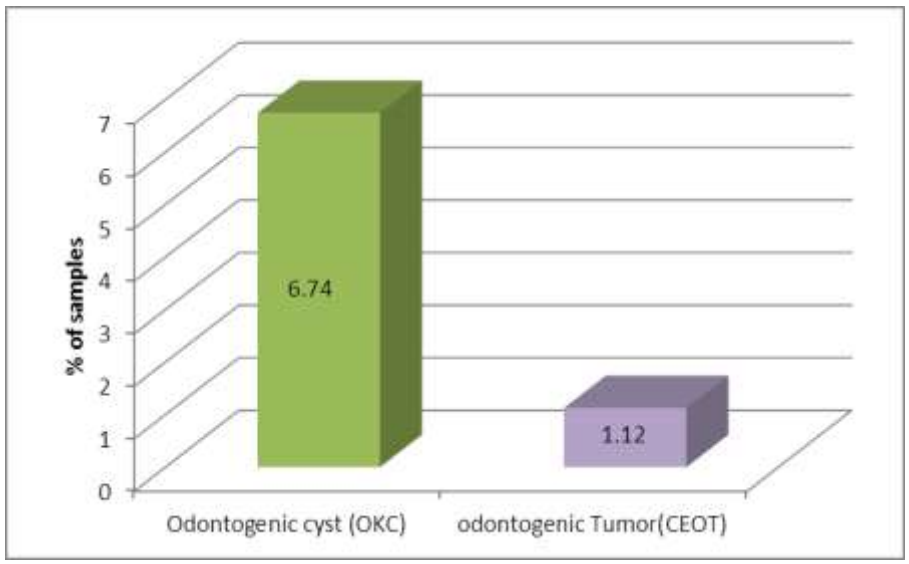


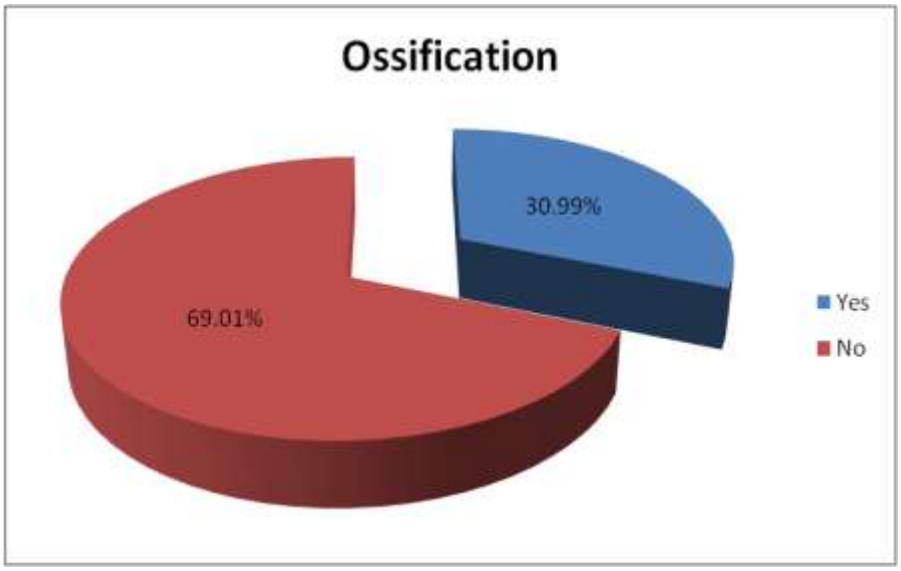
Figure 2: H&E stain sectioned photomicrograph (20x) of CEOT showing sheets of large hyperchromatic epithelioid cells with zones of eosinophlic that may show dystrophic calcification.



Graph 1: Histological observations of epithelium and cystic changes in dental follicles. (Values in %).



Graph 2: Neoplastic changes associated with follicular tissues.



Graph 3: Ossifications associated with follicular tissues.

DISCUSSION

One of the most common challenging decisions made by dental professional is whether to or not to extract an asymptomatic, impacted third molar. In spite of recommendations from the NIH Consensus Conference on third molar removal there are still differences over the clinical judgement to differentiate between normal and pathological conditions in soft tissue around embedded wisdom teeth[6].

Pathological involvement associated with impacted third molars is a clear indication for their removal. Some authors have suggested prophylactic removal as a precautionary measure to prevent further complications due to impacted teeth; others have undermined the scientific validity of this model, arguing on the basis of known risks and complication for third molar removal[7].

Several studies have suggested that this tissue may have the potential for creating cystic and/or neoplastic lesions, still many of these changes are not detectable during clinical or radiographic examination while they may be found through microscopic analysis[4,5,8].

In the present study, two oral pathologists analyzed the hematoxylin and eosin sction of dental follicles independently. The presence of lining epithelium was seen in 48% of the follicles. Out of these, reduced enamel epithelium was present in 23%of the follicles and absence of epithelium was found in 14%. This is in consistence with Kotrashetti V S et al.[9], the reason behind this is loss of epithelium may have resulted from the ameloblast cell adherence to the enamel cuticle, which detaches from specimen during surgery[10].

According to the results obtained in the present study, 43% of dental follicles showed cystic changes and 23% hyperplastic reduced enamel like epithelium. This increase in squamous metaplasia with advancing age may be due to factors such as chronic inflammation or other age-induced effects on dental follicular tissues or remnants of reduced enamel epithelium retained in periodontal ligament space[4].

Other pathologies related to third molar impactions include ameloblastoma and malignant tumors. Incidence of ameloblastoma associated with impacted third molarshas been reported by Regezi et al. (0.14%), Shear &Singh (2%) and Weir et al (2%)[11].

Our study results also showed 8.9% of neoplasms which were in consistence with Rukprasit kulsutas et al,[12] which also showed 58.65% of dentigerous cyst changes, two cases of OKC and one ameloblastoma.

Conklin[13] reported 86% of the follicles with epithelial islands in connective tissue and proliferation of these epithelial rests may indicate neoplastic change. The present study also showed 23 % of proliferating epithelial islands.

Foci of calcifications are normal histological findings of follicular tissues and we saw 30 % of dystrophic calcification. Jim Kin and Gary et al[14], found 37% of follicles with dystrophic calcification while Stanley et al, reported one third of follicles with dystrophic calcification.

Theoretically inflammation should not be expected in follicles of asymptomatic impacted teeth, but 23 % was observed in the present study, similarly Damante and Fleury[10] found 36.1% of follicles reported with inflammation. Inflammatory reaction in follicles could be physiological during eruption of teeth because of oral antigens penetration due to wider intercellular spaces of reduced enamel like epithelium which communicate oral epithelium through periodontal pocket of adjacent teeth.

Girod et al[15] reported that the development of large cysts around impacted third molars took 2-13 years. It seems, therefore that the longer an impaction exists, the greater the risk of development of cysts and tumors.

CONCLUSION

All above data suggests for early removal of third molars even if they are asymptomatic. The present study showed higher incidence of neoplastic and cystic changes which indicate that radiographic feature is not necessarily may be a sign of the absence or presence of disease. Hence clinician while treating asymptomatic impacted third molar should take a detailed clinical and radiographic details and thereafter important step is to submit the follicular tissue for histological evaluation, so as to have awareness of biologic changes associated with impacted teeth and further it may help in removal of impacted teeth of same patient's adjacent or opposite quadrants. In patients those who choose to retain impacted teeth, lifelong follow up will give the impression watchful. We recommend histopathological analysis of all surgically extracted follicle tissue, even when radiographic and clinical findings are not indicative of pathological alterations.

REFERENCES

1. Sanden WJM, Mettes DG, Plasschaert AJM, Grol RPGM, Hof M, Knutsson K, Verdonschot E. Effect of selected literature on dentists' decisions to remove asymptomatic, impacted lower third molars. Eur J Oral Sci 2002; 110: 27.
2. Baykul T, Saglam AA, Aydin U, Basak K. Incidence of cystic changes in radiographically normal impacted lower third molarvfollicles. Oral Surg Oral Med Oral Pathol Oral RadiolEndod 2005; 99: 542-5.
3. Glosser JW, Campbell JH: Pathologic change in soft tissuesassociated with radiographically 'normal' third molar impactions.Br J Oral MaxillofacSurg 1999; 37: 259.
4. Kim J, Ellis GL. Dental follicular tissue: Misinterpretation asodontogenic tumors. J Oral MaxillofacSurg 1993; 51: 7627.
5. Farah CS, Savage NW. Pericoronal radiolucencies and the significance of early detection. Aust Dent J 2002; 47: 2625.
6. Brickley MR, Shepherd JP. Comparison of the abilities of a network and three consultant oral surgeons to make decisions about third molar removal. Br Dent J 1997; 182: 59-63.
7. Haug RH, Abdul- Majid J, Blakey GH, White RP. Evidenced based decision making: The Third Molar. Dent Clin N Am 2009; 53: 77-96.
8. Aldesperger J, Campbell JH, Coates DB, et al: Early soft tissue pathosis associated with impacted third molars without pericoronal radiolucency. Oral Surg Oral Med Oral Pathol OralRadiolEndod 2000; 89: 402.
9. Kotrashetti VS1, Kale AD, Bhalaerao SS, Hallikeremath SR. Histopathologic changes in soft tissue associated with radiographically normal impacted third molars. Indian J Dent Res. 2010 Jul-Sep; 21(3): 385-90.
10. Damante JH, Fleury RN. A contribution of the diagnosis of the small dentigerous cyst or the paradental cyst. PesquiOdontol Bras 2001; 15: 238-46.
11. Regezi JA, Kerr DA, Courtnex RM. Odontogenic tumors:analysis of 706 cases. J Oral Surg 1978; 36: 771-8.
12. Rakprasitkul S. Pathologic changes in the pericoronal tissues of unerupted third molars. Quintessence Int 2001; 32: 633-638.
13. Conklin WW, Stafne EC. A study of odontogenic epithelium in the dental follicle. J Am Dent Assoc 1949; 39: 143-8.
14. Kim J, Ellis GL. Dental follicular tissue; Misinterpretation as odontogenic tumors. J Oral Maxillofac Surg 1993; 51: 762-7.
15. Girod SC, Gerlach KL, Kruhger G. Cysts associated with longstanding impacted third molars. Int J Oral MaxillofacSurg 1993; 22: 110-2.