

Histopathologic Changes in Dental Follicles of Bone-impacted vs. Partially Bone-impacted 3rd Molars

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Abstract

Aim: Pathologic changes within pericoronal tissues of impacted third molars have been reported. Retained impacted teeth within the bone may lead to pathologic changes in pericoronal tissues. This may endanger the patient's health; fortunately, this is rare and most of these pathologic changes are benign. However, as these changes are asymptomatic in nature and differentiation between a normal and an abnormal follicle is clinically difficult if not impossible, microscopic evaluation of histopathology changes of impacted third molar follicles was undertaken.

Materials and Method: Follicles of 100 asymptomatic impacted third molars removed from patients in a private dental clinic were submitted for histopathology examination. Patients with systemic diseases and those with distinct pathologic lesions as well as those with pericoronal infections were excluded. Follicles of both maxillary and mandibular impacted third molars were assessed. The width of pericoronal radiolucencies did not exceed 5 millimeters on periapical radiography. Data including the patients' age, sex, radiolucency, type of impaction, location and presence of second molar root resorption were recorded. Oral pathologists microscopically evaluated the samples, the prevalence of pathologic changes was determined and the demographic factors were statistically evaluated by the chi square and Fisher Exact tests.

Results: In this study of 100 impacted third molar follicles from 78 patients (49 males and 51 females), 54 samples showed pathologic changes ($p < 0.3$). Third molar follicles of patients younger than 25 years showed 66.7% pathologic changes ($p < 0.6$).

Conclusion: We had a high prevalence of pathologic changes in impacted third molar follicles (more than half); these changes were twice as high in patients younger than 25 years and twice as high in the mandible as the maxilla and almost seven times as high (87.1%) in follicles of partial bony impactions than in fully bone impacted 3rd molars. Although the literature shows these follicular changes rarely transform into serious pathologic entities, however, early diagnosis and removal of impacted third molar follicles in adolescence still appear warranted.

Keywords: Impacted third molar; Pathologic changes; Follicle

Introduction

Pathologic changes within pericoronal tissues of impacted third molars have been reported. Retained impacted teeth within the bone may lead to pathologic changes in pericoronal tissues. When an impacted third molar is removed, its pericoronal tissue must be assessed for pathologic changes microscopically [1-4]. Although most of these pathologic changes are benign, however, as these changes are asymptomatic in nature differential diagnosis of a normal follicle from an abnormal one both radiographically and microscopically is important. Because this is clinically difficult if not impossible. Pericoronal tissues of impacted teeth may show pathologic changes such as cyst or neoplasm [5,6]. The origin of several cysts and tumors particularly dentigerous cyst and ameloblastoma can arise from the dental follicle and its ectodermal layer [1-4]. Rakprastikul in a study (2001) reported that 65.58% of 104 samples from the dental follicle showed histopathologic changes [4]. Dachi and Howell I in an x-ray study reported that 10% of 3874 samples from the dental follicle were dentigerous cysts. Thus, differential diagnosis of a normal follicle from abnormal one is of concern [5]. We assessed the prevalence and type of pathologic changes of impacted third molar follicles [6-9].

Patients and Methods

Seventy-eight patients who had referred for removal of their impacted third molar were studied. Patients with systemic diseases, those with specific pathologic lesions in the area and those with dental infection were excluded. All patients had a pericoronal radiolucency width of less than 5 mm on standardized periapical x-rays. The follicle obtained following impacted teeth removal was submitted in 10% formalin to the maxillofacial pathology department. After processing and staining with Hematoxylin and Eosin, the samples were microscopically evaluated via light microscopy and 400 (40×10)

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magnification. Neoplasm and cystic change in the follicular lumen was assessed. The prevalence of pathologic changes in the samples was determined. The data was evaluated by Chi-Square and Exact Fisher tests.

Results

The age of the patients was between 14-40 years and the mean of age was 27. The cause for removal of impacted third molar was prevention of occurrence of pathologic lesions and caries and orthodontic purposes; 100 samples (49 in males and 51 in females) from impacted third molar follicles taken from 78 patients were evaluated; 54 samples (15 in upper jaw and 39 in lower jaw) showed abnormal follicles ($p < 0.3$), (Figure 1). These abnormalities had squamous metaplasia similar to dentigerous cysts or proliferation and nests of odontogenic epithelial remnants (Figures 2 and 3). This form of epithelial change left untreated may transform to mural ameloblastoma; in some samples, the epithelial lining of a cyst wall was discernable but there was no dysplasia (Figure 4).

In 54 samples (27 in males and 37 in females) aged below 25 years 36/54 samples (66.7%) showed pathologic changes ($p < 0.6$); 39/54 samples (72.2%) were in the mandible.

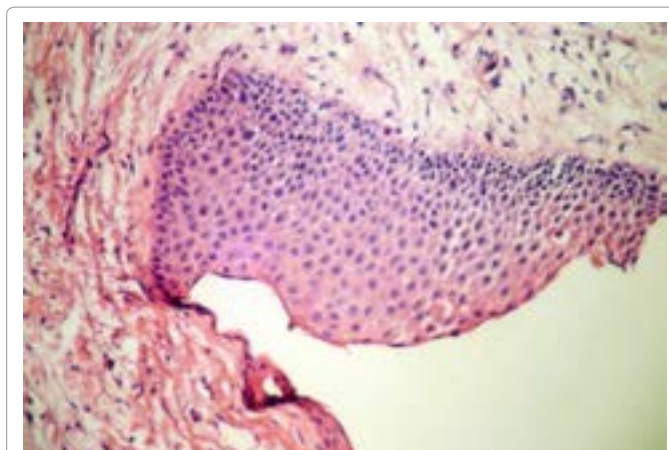


Figure 3: Odontogenic epithelial cluster (H& E x 400).

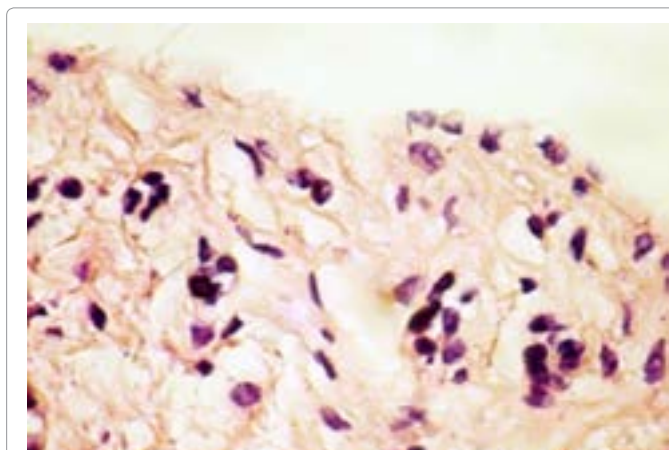


Figure 4: High power view of a cyst wall with no dysplasia (H & E).

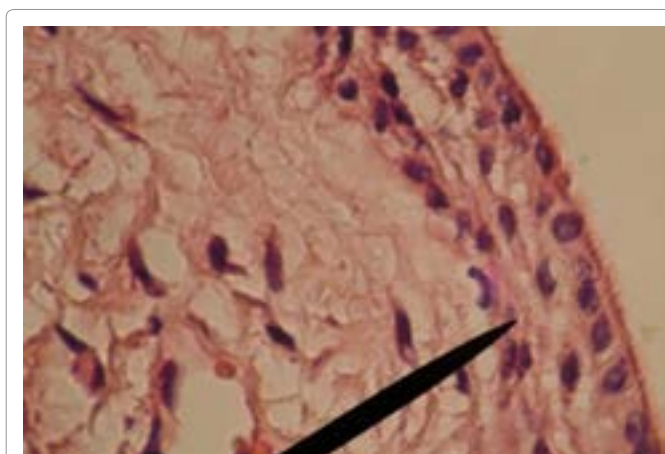


Figure 1: A strip of epithelium composed of 1-2 rows of cuboidal cells (H& E x 400).

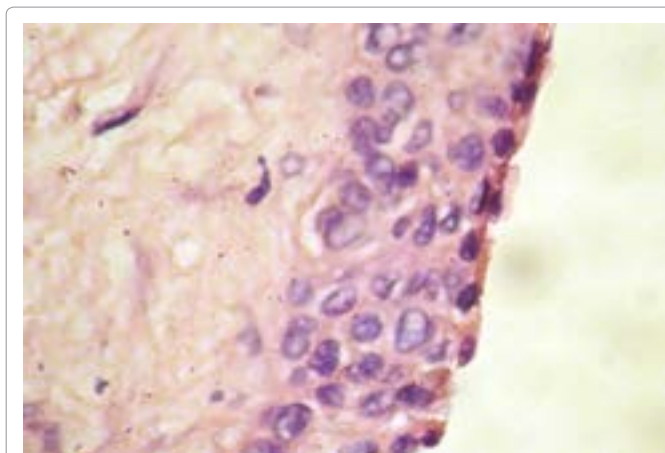


Figure 2: Non keratinized stratified squamous epithelial composed of 4-5 rows of cuboidal cells (H& E x 400).

	Number	P value	Odds ratio
Patient Age <25	36 (66.7%)	<0.7	
Patient Age >25	18 (33.3%)		
Maxilla	15 (27.7%)		
Mandible	39 (72.2%)	<0.3	
Bone Impacted	7 (12.9%)		
Semi-Bone Impacted	47 (87.1%)	<0.06	2.6

Table 1: Distribution of 54 samples of follicles with pathologic changes in impacted third molars.

In 54 samples 47/54 samples (87.1%) were from semi-impacted teeth; 80/100 follicles were from semi-impacted teeth 20/100 were from fully bone impactions (Table 1).

Discussion

Baykul in a study on 94 patients (30 males and 64 females) despite width of follicular space less than 2.5 mm in impacted wisdom teeth surgery reported 50% pathologic change that represented dentigerous cyst similar to our study [8]. Al-Khateeb and Bataineh at the University of Jordan in a study on 2432 impacted lower third molar reported 46.4% pathologic change [9]. Rakprastikul in a study on 92 patients (mean age 26 years) in 104 impacted third molar reported 58.65% pathologic change with 50.94% representing dentigerous cysts. In our study besides the squamous metaplasia in the follicular lumen, the existence of more

than two row of cell layer was reported as a first cystic change [4]. In Adelsperger's study 13 samples of 18 patients over 21 years showed pathologic changes [10]. In our study 18 samples of 36 patients over 25 years old showed pathologic change. At present the existence of more than two layers of epithelial cells are considered pathologic [11]. In our study, there were a large number of odontogenic epithelial remnants that have potential to become mural ameloblastomas.

Conclusion

We had a high prevalence of pathologic changes in impacted third molar follicles (more than half); these changes were twice as high in patients younger than 25 years and twice as high in the maxilla as the maxilla; and almost twice as high in follicles (58.7%) of partial bony impactions than in fully bone impacted 3rd molars. Although the literature shows these follicular changes rarely transform into serious pathologic entities, however, early diagnosis and removal of impacted third molar follicles appear warranted.

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