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Original Article

Clinicopathological analysis of 232 radicular cysts of the jawbone in a population of southern Taiwanese patients



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Abstract This retrospective study aimed to evaluate the clinicopathological features of 232 cases of radicular cyst (January 2001–December 2016) submitted for histopathological examination to Department of Oral Pathology by endodontists in our institution. Demographic data including age, gender, affected site, involved tooth, and histopathological features, were reviewed. The study population comprised 133 females (57.3%) and 99 males (42.7%), with a mean age of 40.5 years and an age range of 13–78 years. Two-hundred and one cysts occurred in the maxilla (86.7%) and 31 in the mandible (13.3%). Most cases involved the anterior teeth of the maxilla (67.2%). The most frequently-involved tooth was the maxillary lateral incisor (50.5%). In most cases (228 cases; 98.3%), the cyst was lined with nonkeratinized stratified squamous epithelium, with two cases containing epithelial lining of the mucoepidermoid epithelium (0.9%) and respiratory epithelium (0.9%), respectively. One case (0.4%) revealed epithelial dysplasia of the epithelial lining. Hyaline body was seen in two cases (0.9%), and Rushton body was noted in seven cases (3.0%). Odontogenic epithelial rest was noted in one case (0.4%). Cholesterol clefts (54 cases; 23.3%), foamy histiocytes (72 cases; 31.0%), hemosiderins (57 cases; 24.6%), dystrophic calcifications (94 cases; 40.5%), foreign bodies (44 cases; 19.0%), and bacterial colonies (22 cases; 9.5%) were also observed. Fifty-three cases (22.8%)

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showed a mixed acute and chronic inflammatory infiltrate, whereas chronic inflammatory infiltrate only was noted in 179 cases (77.2%). In summary, the current findings provide a valuable source for clinicopathological reference concerning radicular cysts of the jawbone.

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Introduction

Periapical lesions originating from infected pulp are the most common pathologic sequelae of the periapical alveolar bone of the jaw. Although nonendodontic periapical lesions can occur in the periapical alveolar bone [1], the majority of periapical lesions comprise radicular cysts (or periapical cysts), periapical granulomas and apical periodontitis, accounting for approximately 88% and 73% of all periapical lesions according to studies of Becconsall-Ryan et al. [2] and Koivisto et al. [3], respectively.

Most inflammatory periapical lesions are usually treated with root canal therapy in dental clinics initially; however, when symptoms and signs still persist, and complete healing of the periapical alveolar bone fails to occur, surgical curettage or enucleation is employed to remove the pulpo-periapical pathoses. Surgical specimens from periapical lesions are subsequently submitted for histopathological diagnosis [4]. To the best of our knowledge, a comprehensive survey of the clinical and histopathological features of radicular cysts in Taiwanese patients has been limited. Moreover, there exists a greater diversity of histopathological features of radicular cysts as compared with periapical granulomas. Therefore, the current study aimed to retrospectively analyze the clinicopathological characteristics of radicular cysts in a population of southern Taiwanese patients, and to provide updated information regarding radicular cysts and comparisons with previous studies [4–11].

Materials and methods

All cases of radicular cyst in the current study, retrieved from between January 2001 and December 2016, were treated by two experienced certified endodontists of our institution, who performed either curettage or enucleation in all cases in the present study population. Demographic data including the age and gender of the patients, as well as the affected region (maxilla/mandible) and the involved tooth, were recorded. Due to the retrospective nature of the present study, informed consent was waived in accordance with the standards of the Institutional Review Board of Kaohsiung Medical University Hospital (KMUHIRB-E(II)-20150161).

Specimens were fixed in 10% neutral formalin, dehydrated in graded alcohol, and embedded in paraffin. Tissue paraffin blocks were cut into serial sections of a thickness of 4 μ m and stained with hematoxylin and eosin. A histopathological diagnosis and an evaluation of the histopathological features were made by two board-certified oral and maxillofacial pathologists.

The histopathological criteria for a radicular cyst were defined as: (1) located in the periapical region of a non-vital tooth without periodontal communication, and (2) a lesion demonstrating a cystic cavity chiefly surrounded by a nonkeratinized stratified squamous epithelial lining, with inflammatory cells in the connective tissue wall [4]. The degree of chronic inflammation was classified as mild when the proportion of the chronic inflammatory cells were less than 25% of the whole tissue; whereas the proportion of chronic inflammatory cells was between 26% and 50%, and more than 50%, it was categorized as moderate and severe, respectively [4].

Results

A total of 232 cases of radicular cyst were histologically analyzed over the 16-year study period. The study population comprised 133 females (57.3%) and 99 males (42.7%), with a mean age of 40.5 years and a relatively wide age range (13–78 years). The lesions were mostly occurred in the 3rd and 5th decades of life (both with 57 cases; 24.6%) contributed for nearly 50% of the total number of cases, followed by the 4th decade (43 cases; 18.5%), and the 6th decade (33 cases; 14.2%). Of the 232 cases of radicular cysts, 201 cases occurred in the maxilla (86.6%) and 31 in the mandible (13.4%) (Table 1).

A total of 270 teeth were affected, the most commonly involved being the anterior teeth of the maxilla (69.3%), followed by the premolars of the maxilla (12.5%) and the

Table 1 Age, gender, and jawbone region distribution of 232 patients with radicular cysts ($n = 232$).

| | |
|-------------|-------------|
| Age (years) | |
| 0–9 | 0 |
| 10–19 | 14 (6.0%) |
| 20–29 | 57 (24.6%) |
| 30–39 | 43 (18.5%) |
| 40–49 | 57 (24.6%) |
| 50–59 | 33 (14.2%) |
| 60–69 | 15 (6.5%) |
| 70–79 | 13 (5.6%) |
| 80–89 | 0 |
| Sex | |
| Female | 133 (57.3%) |
| Male | 99 (42.7%) |
| Region | |
| Maxilla | 201 (86.6%) |
| Mandible | 31 (13.4%) |

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