Nonendodontic Lesions Misdiagnosed as Apical Periodontitis Lesions: Series of Case Reports and Review of Literature

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Abstract

Introduction: This study aimed to analyze cases referred from a reference service in oral pathology that were initially misdiagnosed as periapical lesions of endodontic origin and to perform a review of the literature regarding lesions located in the apical area of teeth with a nonendodontic source. **Methods:** A survey was made of clinical cases derived from the service of oral pathology from 2002 to 2012. The pertinent literature was also reviewed using ScienceDirect and PubMed databases. The lesions were grouped into benign lesions mimicking endodontic periapical lesions (BLMEPLs), malignant lesions mimicking endodontic periapical lesions (MLMEPLs), and Stafne bone cavities. The clinical presentations were divided into lesions with swelling without pain, lesions with swelling and pain, and lesions without swelling but presenting with pain. **Results:** The results showed that 66% (37/56) of cases represented benign lesions, 29% (16/56) malignant lesions, and 5% (3/56) Stafne bone cavities. The most commonly reported BLMEPLs were ameloblastomas (21%) followed by nasopalatine duct cysts (13.5%). The most frequently cited MLMEPLs were metastatic injuries (31.5%) followed by carcinomas (25%). The main clinical presentation of BLMEPLs was pain, whereas that of MLMEPLs was swelling associated with pain; Stafne bone cavities displayed particular clinical findings. **Conclusions:** Clinical and radiologic aspects as well as the analysis of the patients' medical history, pulp vitality tests, and aspiration are essential tools for developing a correct diagnosis of periapical lesions of endodontic origin. However, if the instruments mentioned earlier indicate a lesion of nonendodontic origin, a biopsy and subsequent histopathological analysis are mandatory. *(J Endod 2014;40:16–27)*

Key Words

Apical periodontitis, endodontic lesions, misdiagnosis, neoplasia mimicking apical periodontitis, periapical lesion

Apical periodontitis lesions generally have an etiology that is associated with necrosis and infection of the root canal system that manifests itself as the host defense response to microbial challenge (1, 2); they are usually identified as radiolucency located in the apex of the teeth on radiographic examinations. These lesions could be chronic (eg, radicular cysts, granulomas, and chronic abscesses) or acute (eg, periradicular abscess or cellulitis) and represent approximately 90% of all periapical lesions (3).

However, there are lesions of neoplastic sources, cystic lesions of nonendodontic origin, and anatomic variations such as a Stafne bone cavity (SBC) that when located in the periapical area of the teeth might radiographically and clinically mimic lesions of endodontic origin, especially when associated with teeth with pulp necrosis or that were previously treated endodontically, leading to misdiagnosis and an ineffective therapeutic protocol (4, 5).

For a proper diagnosis, a detailed review of the patient's past medical and dental histories and the clinical aspects and specific radiographic findings represent important steps in the diagnostic process and may prevent a diagnostic dilemma. Considering these aspects, it is possible to reduce the amount of diagnostic confusion (6, 7). The aim of this study was to analyze cases referred from a reference service in oral pathology that were initially misdiagnosed as periapical lesions of endodontic origin and to perform a review of the literature regarding lesions located in the apical area of teeth with a nonendodontic source.

Materials and Methods

After a survey of the clinical cases referred from the service of oral pathology of the University Hospital João de Barros Barreto, Belém, Pará, Brazil, from 2002 to 2012, 11 cases, which were initially misdiagnosed as periapical lesions of endodontic origin, were selected. After a review of the patients' past medical and dental histories, aspiration, pulp vitality tests, and clinical/radiographic evaluations, these lesions were biopsied and correctly diagnosed as lesions of nonendodontic origin.

Beyond the case reports from the service of oral pathology, the pertinent literature was reviewed using predefined key words in the ScienceDirect and PubMed databases to search for articles that reported cases about periapical lesions of nonendodontic origin, which were previously diagnosed and, in some cases, treated like endodontic disease. To perform the literature search, the following key words were used: neoplasia mimicking periapical lesions, carcinoma mimicking periapical lesions, benign lesion mimicking periapical lesion, lesion mimicking a dentoalveolar abscess, lesion mimicking dental infection, lesion mimicking radicular cyst, lesion mimicking dental granuloma, lesion mimicking endodontic lesion, lesion mimicking apical periodontitis, neoplasia mimicking apical periodontitis, and tumor mimicking apical periodontitis.

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Using these keywords, 147 articles were identified. Despite the large amount, 27 titles appeared more than once (3–4 times each) in the search, decreasing the number to 44 articles. Excluding those that were unrelated to the topic (did not report nonendodontic lesions mimicking apical periodontitis), 45 clinical cases remained for analysis. Thus, a total of 56 cases were analyzed, 11 from the service and 45 from the literature review. From the case reports, the following data were extracted: the type of the lesion and its location, the patients' age and sex, the evolution time of the lesion, radiographic aspects, positive/negative pulp vitality of the involved teeth, local signs and symptoms, the initial diagnosis impression, and the treatment of the lesions.

The lesions were separated into the following 3 groups: benign lesions mimicking endodontic periapical lesions (BLMEPLs), malignant lesions mimicking endodontic periapical lesions (MLMEPLs), and Stafne bone cavities (SBCs).

Inclusion Criteria

All of the reviewed article were published in the English and presented case reports involving diagnosis through histopathological analysis, which included sufficient information about clinical and radiologic aspects of the lesions.

Results

After a review of the archives derived from the service of oral pathology from 2002 to 2012, 11 report cases were chosen, which are detailed in Table 1. The cases described in the literature are detailed in Table 2 (benign cases), Table 3 (malignant cases), and Table 4 (SBC cases).

Together, the results showed that 66% (37/56) of cases represented benign lesions, 29% (16/56) malignant lesions, and 5% (3/56) SBCs. The most commonly reported BLMEPLs were ameloblastomas (21%) followed by nasopalatine duct cysts (13.5%). The most frequently cited MLMEPLs were metastatic injuries (31.5%) followed by carcinomas (25%). The main clinical presentation of BLMEPLs was pain (29.7%), whereas that of MLMEPLs was swelling associated with pain (46.6%); SBCs displayed particular clinical findings (asymptomatic radiolucent lesions).

From the 56 cases, 48 cases reported pulp vitality; approximately 56.5% of teeth answered positively (27/48) and 43.5% negatively (21/48). In 6 cases, the involved teeth had already been endodontically treated.

The predominant radiographic appearance of BLMEPLs in the service of oral pathology was a radiolucent area associated with the involved teeth (9/10 cases) as shown in Figure 1*A–D*. The intraoral and radiographic aspects of the only malignant case are shown in Figure 2*A* and *B*. The most observed radiographic profile of the lesions collected from the literature review including benign, malignant, and SBC cases was a radiolucent aspect, representing 93.3% of all cases.

There was no predominance between the mandible and maxilla in MLMEPLs; however, the posterior region predominated (62.5%) when compared with the anterior region (37.5%). The BLMEPL group showed a mandibular predominance (22/37), with slight differences between the anterior (43.25%) and posterior (56.75%) regions. With regard to SBCs, the 3 cases reported in the literature occurred in the anterior region of the mandible.

The majority of MLMEPLs were described from the third decade, with only 2 cases occurring in previous decades. The mean age of metastatic lesions in our study was 50 years (the youngest patient was 39 years and the oldest 62 years), with 80% located in the mandible.

The BLMEPL group comprised cysts, neoplasms, and fibro-osseous lesions. Considering the neoplasms, the results show that the mean age was 30.2 years. The cysts represent 35.2% of BLMEPLs with a mean age of 29 years. The fibro-osseous lesions represent 10.8% of benign lesions with a mean age of 37.5 years.

Discussion

Reports about nonendodontic lesions mimicking apical periodontitis and their misdiagnosis can be frequently found in the literature. This fact occurs because lesions, especially those of neoplastic origin, can present an aspect of radiolucency in the jaws (8–11). In 2012, Koivisto et al (12), analyzing the frequency and distribution of radiolucent jaw lesions in 9,723 cases, found that 73% represented apical granulomas and cysts, 8.8% keratocystic odontogenic tumors, 1.3% central giant cell lesions, 1.2% ameloblastomas, and less than 1% metastatic lesions. Hence, the aim of this article was to analyze cases in the literature derived from a reference service in oral pathology that were initially misdiagnosed as apical periodontitis lesions of endodontic origin.

Periapical lesions of endodontic origin are associated with infection followed by necrosis of the dental pulp (1, 2). Once the dental pulp is contaminated and infected, the periapical region starts to shelter a series of host defense elements against toxic components contained in the root canal system, including cytokines, antibodies, and host defense cells. Therefore, the periapical area begins to undergo osteolytic alterations (13). However, differential diagnoses of periapical lesions should consider lesions of nonendodontic origin, including cysts, anatomic variations, and neoplastic lesions, because of their different treatments and prognoses (3).

Koivisto et al (12) showed that the majority of cysts (more than one third) occur in the anterior maxilla. In this region, radicular cysts can cause asymptomatic swelling because of the thin cortical bone of this anatomic site (14). In our study, 25% and 10.8% of MLMEPLs and BLMEPLs, respectively, presented asymptomatic swelling, and from these cases, 75% (3/4) of BLMEPLs and 50% (2/4) of MLMEPLs with asymptomatic swelling were found in the anterior maxilla. Thus, although asymptomatic swelling in the anterior maxilla cannot be used as a criterion to exclude benign and malignant lesions that could mimic endodontic lesions, it is suggestive, in principle, of a radicular cyst, especially if there is a tooth without positive pulp vitality associated (15).

Swelling and pain were the most cited symptoms of MLMEPLs (46.6%), whereas BLMEPLs presented these associated symptoms in only 10.8% of all cases. Such clinical cases could simulate acute lesions of endodontic origin. Therefore, pulp vitality tests may help to elucidate the origin of the disorder (16). The teeth associated with apical periodontitis lesions will show negative responses to pulp sensitivity (4, 17). If the teeth exhibit positive responses to the vitality test, despite having swelling and associated pain, the dentist should consider lesions of nonendodontic origin in the differential diagnosis. In the present study, 48 cases reported pulp vitality; approximately 56.5% of teeth answered positively and 43.5% negatively. In 6 cases, the involved teeth had already been endodontically treated. From this fact, it can be stated that coincidental clinical findings may occur; the tooth can present pulp necrosis or already have been endodontically treated, whereas the apex lesion could be of a nonendodontic source.

Therefore, it is interesting to emphasize that lesions of nonendodontic origin may lead to pulp necrosis when located close to root apices (7, 18, 19). For this reason, the dentist cannot base diagnosis only on the pulp vitality test but should also consider the clinical history (20) and perform a judicious clinical examination (including a review of the patient's past medical and dental histories and physical examination) to look for a local cause of the pulp infection, such as caries, infiltrated restorations, or root canal treatment performed