



ORIGINAL ARTICLE

# Frequency and distribution of mandibular condensing osteitis lesions in a Taiwanese population



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## KEYWORDS

condensing osteitis;  
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**Abstract** *Background/purpose:* Condensing osteitis (CO) is a common lesion of the jaw bone. This study surveyed the occurrence of mandible CO and its distribution in the mandible in a Taiwanese population.

*Materials and methods:* Panoramic radiographs and clinical information of 1098 patients at the Dental Department of Tri-Service General Hospital (Taipei, Taiwan) were collected. The patient data were analyzed to determine the CO disease status, patient age distribution, sex, CO location in the mandible, and the status of the affected tooth.

*Results:* Seventy-five CO lesions were identified in 63 patients. The prevalence of CO in the mandible was 5.7%. Eight (10.7%) CO cases were associated with teeth that had crowns and/or bridges, 16 (21.3%) CO cases were associated with teeth that had caries or restorations; 22 (29.3%) CO cases were associated with teeth that had received root canal therapy, nine (12%) CO cases were associated with teeth with periodontal diseases, and 20 (26.7%) CO cases were located in the tooth extraction area. The percentage of females and males was 65.3% and 34.7%, respectively. Ten (13.3%) CO cases and 65 (86.7%) CO cases were identified in the pre-molar and molar area, respectively. The most common site of CO was in the first molar region.

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**Conclusion:** In our study population, the CO lesion occurs more commonly in female patients who were in their 60s. The mandibular 1<sup>st</sup> molar and teeth that had received root canal therapy had the highest association with CO. The CO distribution, as determined from this study, can provide valuable information for future clinical references.

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## Introduction

Focal osteoscleroses are common lesions of the jaw bones and are frequently encountered during dental radiographic examination. Many of these scleroses represent a variety of inflammatory, hyperplastic, or neoplastic processes. The so-called condensing osteitis (CO) is a localized area of dense bone that may represent a reactive hyperplasia of osteoblasts, which can occur as a result of pulpal insults such as a deep carious lesion or restoration. This condition has been determined as a pathosis-forming response to a chronic and low-grade inflammatory stimulus.<sup>1,2</sup> Thus, CO can be defined as asymptomatic, uniformly radiopaque foci of dense bone; its manifestation is often the sequela of dental infection.

The most common radiopaque lesion in the jaws is CO, which occurs in 4–7% of the general population.<sup>3</sup> The typical feature of CO consists of a uniform dense radiopaque mass that is adjacent to the apex of the tooth and has well-defined margins and a vague transition to the surrounding bone that occurs in combination with the apical loss of lamina dura and widening of the periodontal ligament space. Unlike CO, idiopathic sclerosis is often unrelated to pathologic lesions of the dental pulp and it is neither an inflammatory nor neoplastic process. Condensing osteitis is commonly identified in the mandible and is most frequently associated with the mandibular first molar and female patients.<sup>4,5</sup> Other common sites of CO can also occur in edentulous areas, with teeth that received root canal, and in carious, inflamed, or necrotic pulps.<sup>4–8</sup>

Condensing osteitis deposits usually include histologically normal bone marrow replaced by fibrous connective tissue, and are occasionally accompanied by inflammatory cell infiltration, *de novo* bone formation, and the presence of bone sequestrum. Because of the inclusion of dense trabeculae within a reduced and limited area of bone marrow, CO often resemble compact bone. The CO bone tissue can contain osteoblasts, whereas the bone marrow contains lymphocytic infiltration. Condensing osteitis is characterized by dominant osteoblast activity that results in bone apposition. In this situation, mild periapical infection-stimulated bone apposition is frequently observed in patients with a very high level of tissue resistance.

There are very few available literature reports that have studied CO lesions, and the frequency and distribution of CO in Taiwan have not yet been reported. Therefore, the aim of this study is to investigate the frequency of CO lesions in Taiwan, with respect to a patient's age, sex, and mandibular CO localization.

## Materials and methods

### Patients and radiography

The researchers retrospectively studied the panoramic radiographs of 1098 patients for the presence of periapical radiopaque lesions. The patients age ranged from 18 years to 88 years. These panoramic radiographs were obtained between 2005 and 2010 at the Dental Department of Tri-Service General Hospital in Taipei, Taiwan for the purpose of dental treatment. All films used in this study were deemed technically acceptable for interpretation by the radiologists. For each panoramic film, the patient's age and sex was recorded, based on the patient's file.

### Diagnostic criteria

The panoramic radiographs were screened, and the tooth condition and periapical condition were recorded. Condensing osteitis and idiopathic osteosclerosis (IOS) are the most common cause of periapical radiopaque.

Lesions were considered as CO if it was likely that they were associated with chronic inflammation. These lesions generally surrounded the apex of teeth with deep caries or large restorations, a crown or bridge, periodontal disease, root canal therapy, or an extracted area (Fig. 1A–E).

If it was impossible to classify radiopaque (RO) lesions or associate them with a specific source such as a pulpal insult (i.e., sound teeth, nonrestored teeth, teeth with small restorations), the lesions were categorized as idiopathic osteosclerosis (IOS) (Fig. 1F) and were excluded from this study. Diffuse and multiple radiopaque lesions were identified by the presence of multiple enostoses, diffuse cemental masses, diffuse sclerosing osteomyelitis, and florid osseous dysplasia. These RO lesions were also excluded from the study. In addition, periapical lesions involving anterior vital teeth with periapical cemental dysplasia were excluded.

The panoramic radiographs were reviewed simultaneously by two authors (Y.S.S. and C.Y.C.), and the patient was diagnosed as having CO when both authors agreed on the radiographic diagnosis. If there was any disagreement, the patient was excluded from this survey.

The location of CO was classified according to their distribution in the mandible: anterior region (i.e., incisor to canine teeth); premolar region (i.e., 1<sup>st</sup> and 2<sup>nd</sup> premolars); and molar region (i.e., 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> molars).

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