Cytogenetics of Central Giant Cell Granuloma of the Mandible

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Purpose: Central giant cell granuloma is a benign entity that commonly occurs in the mandible and maxilla. It is usually treated by surgical excision, varying from curettage to en bloc resection. Because the entity is more common in diseases such as neurofibromatosis, a genetic element may be involved in its pathogenesis. Cytogenetic studies of central giant cell granuloma affecting bone are rare, and to the authors' knowledge, there are none reported in the literature for central giant cell granuloma of the mandible.

Materials and Methods: The authors investigated the cytogenetic profile of a case occurring in the mandible. Fresh biopsy tissue was minced and cultured in RPMI-1640 medium. Cells were fixed and stained, and cytogenetic analysis was performed according to standard procedures.

Results: A clone with t(1;17;18) and other random numerical chromosomal changes was found.

Conclusions: The significance of these findings in diagnosis and prognosis is currently unclear and further karyotyping studies are needed to more fully understand this tumor.

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Central giant cell granuloma (CGCG) is a benign bone lesion that usually occurs in the mandible and maxilla and accounts for fewer than 7% of all benign tumors of the jaws.[1] CGCG also can affect other facial and cranial bones and small long bones, such as those of the hands and feet.[2] It is more common in adolescents and young adults.[3]

CGCGs consist of numerous multinucleated giant cells and mononuclear cells embedded in a fibrocellular stroma. Foci of hemosiderin pigment and newly formed osteoid or bone are occasionally observed.[4] The clinical behavior of CGCG is variable, ranging from a slowly growing, asymptomatic osteolytic lesion to an aggressive process associated with pain, root resorption, cortical bone destruction, and a tendency to recur after surgical treatment.[5,6]

The pathogenesis of CGCG of the jawbones remains controversial, because speculations of whether it represents a reactive, inflammatory, infective, or neoplastic process are still debated.[7]

The relation of CGCG to giant cell tumor (GCT) in the jawbones also is controversial. Some investigators have suggested that, unlike CGCG, true GCT is very rare in the jaws, whereas others believe that GCT and CGCG represent a continuum of the same disease process and GCT can occur in jaw bones.[8,9]

CGCGs are classified as aggressive or nonaggressive lesions based on signs, symptoms, and histologic features.[10]

Cytogenetic studies of CGCG are very rare in the jaws and other bones. A report described chromosome abnormalities in a GCT of the long bones,[11] and a clonal abnormality has been reported in 1 case of CGCG affecting the distal phalanx, namely t(X;4)(q22;q31.3).[12] An unstable translocation (8;22) also was found in giant cell reparative granuloma of the first metacarpal thumb.[13] In the jaws, a genetic profiling of CGCG using DNA microarray showed that the expressions of several genes were up- or downregulated,[14] but comparative genomic hybridization of 6 clinically aggressive cases

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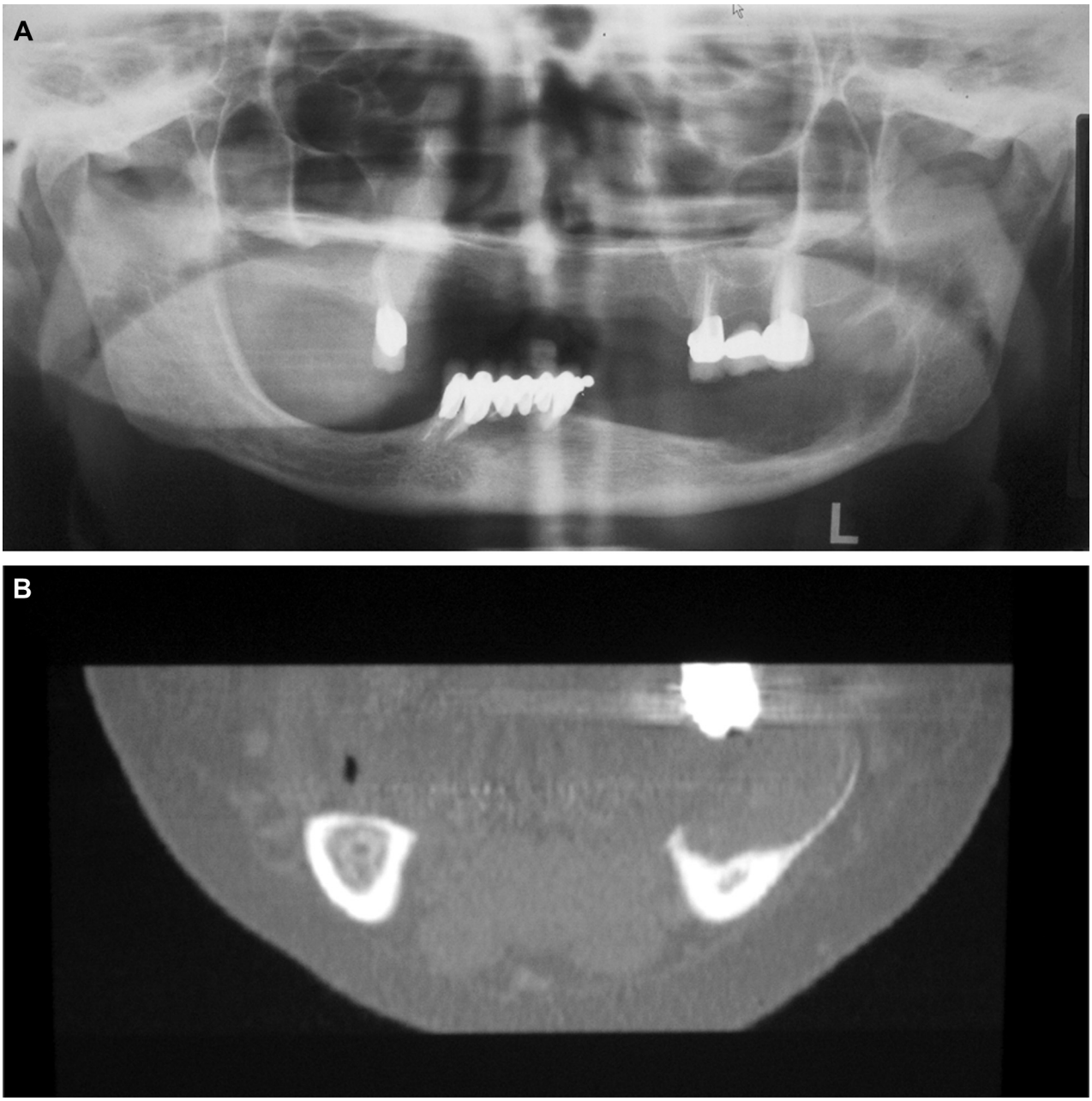

FIGURE 1. *A*, Panoramic radiograph of a large central giant cell granuloma of the left mandible. *B*, Coronal computed tomogram of the left mandible shows a unilocular, expansile, osteolytic lesion surrounded by a thin bony shell.

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of CGCG of the jaws did not show any unbalanced chromosomal alterations,[6] and a reciprocal translocation 46,XY, t(2;10)(q23;q24) was found in the hard palate.[15]

The etiology of CGCG is still unknown, but the occurrence of CGCG in the jaws of patients with known genetic diseases, such as neurofibromatosis type 1, cherubism, and Noonan syndrome, indicates that a genetic-related etiology might be possible.[16] To the authors' knowledge, there are no reports of the cytogenetic findings of mandibular CGCG published in the literature. The authors describe the first cytogenetic analysis of CGCG occurring in the mandible of a 63-year-old woman.

Report of Case

A 63-year-old woman presented with a several-month history of tenderness in the left mandible. There was no previous trauma or contributory medical