

Original Article

Osteoma of the mandible: From incidental finding to surgical management and implant restoration

Wan-Chen Chen¹, Yu-Chao Chang^{1,2}

¹ School of Dentistry, Chung Shan Medical University

² Department of Dentistry, Chung Shan Medical University Hospital

Osteoma is a benign osteogenic tumor arising from the proliferation of cancellous or compact bone. We report a case of a 60-year-old male with osteoma presenting on the right posterior mandible without symptoms during pre-implantation examination. After careful examination, osteoma was surgically removed, followed by filling with synthetic bone graft and implant restoration. The results of this case study may provide treatment guidelines for osteoma from surgical removal to final restoration.

Key words: osteoma, regeneration, implant

Introduction

Osteoma is a benign tumor characterized by the production of mature compact bone or cancellous bone and slow growth that can present at single or multiple sites.¹ The etiology of osteomas is believed to be persistent embryogenic periosteum, which may be responsible for the initiation of new bone formation. Trauma, infection, and inflammatory conditions might be promoting factors. The mandible is more frequently involved than the maxilla. In asymptomatic patients, craniofacial osteomas need to be further investigated for a precise diagnosis. The clinical importance of osteomas lies in their differentiation from malignant lesions such as osteosarcoma.

Due to the frequent use of dental radiography, dentists are more frequently confronted with incidental findings such as osteomas of the jaw bone. We present a case of incidentally found

osteoma of the mandible, as well as describe the surgical management, histopathological diagnosis, and implant restoration.

Case presentation

A 60-year-old man was referred by his general dental practitioner for an incidentally found round radiopaque tumor in the edentulous area of right posterior mandible on dental panoramic tomography during pre-implantation evaluation (Fig. 1a). The patient was asymptomatic, but very concerned about the nature of the tumor. Generally, he was in good health and the extra- and intraoral examinations were unremarkable. Cone beam computed tomography (CBCT) image revealed a well-defined solitary intra-osseous tumor within the mandible body measuring 1.5x1x0.5cm in maximum dimension (Fig. 1b). Based on clinico-radiological findings, diagnosis was osteoma.

The lesion was surgically excised under local anesthesia through surgical flap reflection. The gross specimen, which was sent to the Department of Pathology, Chung Shan Medical University Hospital for further histopathological analysis, was smooth and ivory-type in appearance. Histopathological examination revealed well

* Correspondence: Dr. Yu-Chao Chang
School of Dentistry, Chung Shan Medical University
Address: No. 110 Chien-Kuo N. Road, Sec. 1, Taichung,
Taiwan 40201
Tel: +886-4-24718668
Fax: +886-4-24759065
E-mail: cyc@csmu.edu.tw

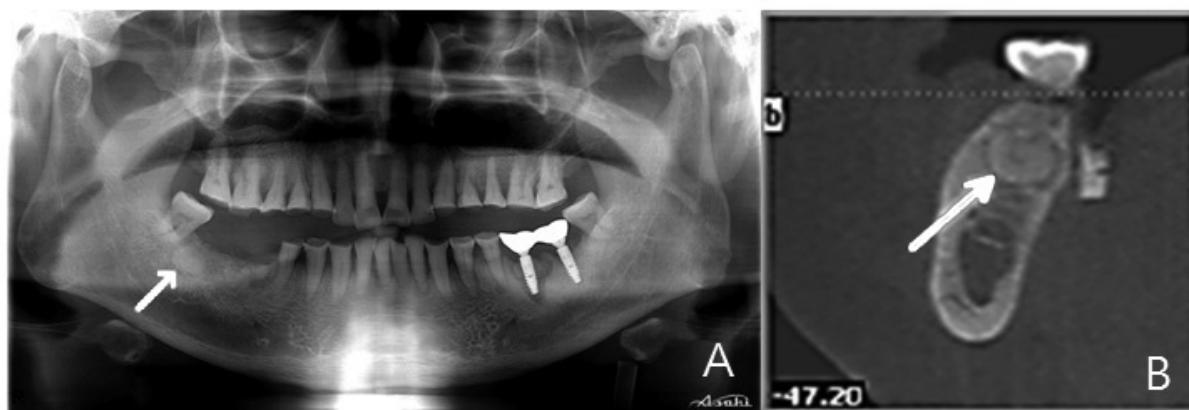


Fig. 1 Schematic of the pipeline for creating the brain structural connectivity matrix and network.

circumscribed, unencapsulated, normal-appearing, extremely dense cortical bone with minimal marrow tissue (Fig.2). The final histopathology report confirmed the diagnosis of mandibular osteoma with no signs of malignancy. The bony defect was filled with synthetic bone graft (Bicera,60% hydroxyapatite and 40% beta-tricalcium phosphate, Wiltron Co., Ltd, Hsinchu, Taiwan). Postoperative healing was uneventful and the patient was followed-up for a period of 8 months. Compared with initial periapical radiography (Fig.3a), bone-like density was found within the extraction socket after surgical removal of osteoma (Fig. 3b). Then, the surgical edentulous site was surgically reentered for implant placement. At the time of implant insertion, the socket was completely filled with a hard material, which exhibited the consistency of bone on probing. Two cylindrical implants were inserted (Prima, Keystone Dental, Inc., MA, USA). Healing process under regular clinical examination was uneventful. After a healing period of 4 months, the implant was exposed for crown fabrication (Fig. 3c). From comparisons of periapical radiographic evaluation with initial implant placement, the peri-implant bone was stable and the grafted bone material was compact (Fig. 3d). The patient did not have any other symptoms and was satisfied with the implant restorations. He continued to be regularly followed up.

Discussion

The differential diagnosis of osteomas includes exostose, osteochondroma, osteoid osteoma, periosteal osteoblastoma, parosteal osteosarcoma, peripheral ossifying fibroma, Paget's disease, fibrous dysplasia, and odontoma. Among these, exostoses and tori are the most common. They cannot be considered neoplasms. Osteoid osteomas and osteoblastomas are usually distinguishable from osteomas in that they have a faster growth rate and are associated with pain.³ Ossifying fibroma can radiologically mimic osteoma but usually differs, with the mass lacking continuity with the cortical bone of origin.⁴ Periosteal osteosarcoma can be excluded from the differential diagnosis because it has faster growth and a much

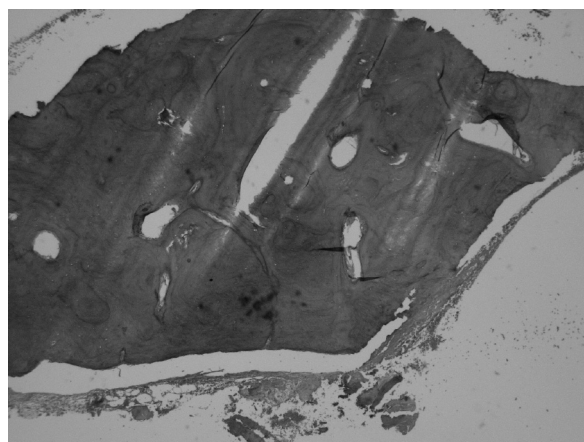


Fig. 2 Higher topological measures were found in teenage male brain networks on DTI, including (a) clustering coefficient, (b) local efficiency, (c) transitivity, and (d) small-worldness index ($p < 0.05$).

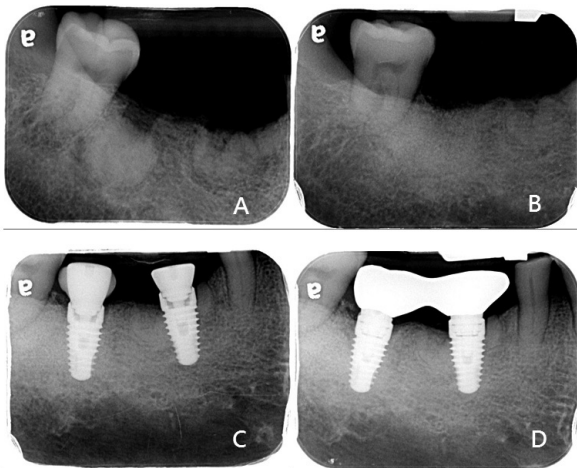


Fig. 3 From the results of network-based statistical analysis, (a) more intra-hemispheric connectivity was found in teenage males, and (b) more interhemispheric connectivity was found in teenage females ($p < 0.05$).

less uniform pattern of radiodensity.⁵ Parosteal osteosarcoma is commonly seen in posterior mandible, and is a homogeneous or heterogeneous, ill defined, lobulated, sclerotic mass. Along the periphery, there is either sun burst appearance or formation of Codman's triangle.⁶ Paget's disease is more common in femur, skull, and vertebrae and less common in jaws. Moreover, it most often occurs in older age group and is almost always bilateral when it involves the jaws; with the maxilla more commonly affected. It is also associated with bone deformation and enlargement.⁷ Fibrous dysplasia commonly involves the posterior maxilla and radiographically appears as a diffused radiopaque mass with varied pattern like that of ground glass, orange peel, or cotton wool.⁸ Odontomas often interfere with the eruption of permanent teeth. They have radiopacity equivalent to that of teeth and are surrounded by a radiolucent capsule.⁹

This asymptomatic osteoma underwent clinical, radiographic, and histologic examinations. It was surgically removed with simultaneous bone graft.

After proper healing period, two dental implants were inserted into the edentulous area. On regular follow up, this patient did not present with any other symptoms and was satisfied with the implant restorations. This case report may provide valuable information for the treatment of osteomas.

References

1. Walker DG. Benign nonodontogenic tumors of the jaws. *J Oral Surg*, 1970; 28:39-57.
2. Sayan NB, Uçok C, Karasu HA, et al: Peripheral osteoma of the oral and maxillofacial region: A study of 35 new cases. *J Oral Maxillofac Surg*, 2002; 60:1299-1301.
3. Greenspan A, Remagen W: Bone forming tumors, in Greenspan A, Remagen W (eds): *Differential Diagnosis of Tumors and Tumor-Like Lesions of Bone and Joints*. Philadelphia, Lippincott-Raven, 1998, pp 25-122
4. Bodner L, Dayan: Growth potential of peripheral ossifying fibroma. *J Clin Periodontol* 14:551, 1987
5. Johann AC, Freitas JB, de Aguiar MC, et al: Peripheral osteoma of the mandible: Case report and review of the literature. *J Craniomaxillofac Surg* 33:276, 2005
6. "Malignant diseases of the jaws," in *Oral Radiology*, White SC and Pharoah MJ, Eds., p. 469, Elsevier, New Delhi, India, 5th edition, 2004.
7. "Diseases of bone manifested in jaws," in *Oral Radiology*, White SC and Pharoah MJ, Eds., pp. 507-509, Elsevier, NewDelhi, India, 5th edition, 2004.
8. "Diseases of bone manifested in jaws," in *Oral Radiology*, White SC and Pharoah MJ, Eds., pp. 485-489, Elsevier, New Delhi, India, 5th edition, 2004.
9. "Benign tumors of the jaws," in *Oral Radiology*, White SC and Pharoah MJ, Eds., pp. 424-428, Elsevier, NewDelhi, India, 5th edition, 2004.

