

Giant cell reparative granuloma of the mandibular condyle: A long-term case report and review of the literature

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Giant cell reparative granuloma (GCRG) of the mandibular condyle is a rare benign non-neoplastic osteolytic lesion. The authors report the successful surgical management of such a case with a follow-up of nine years and review of the current literature on this subject. To their knowledge, the present article is the first to report the long-term result of condylar reconstruction following GCRG resection. There are no articles in the literature detailing the reconstructive techniques used after resection of large GCRG of the condyle. Accordingly, the present article also reviews the reconstructive options in the management of GCRG of the condyle.

Key Words: Condyle reconstruction; Costochondral graft; Craniofacial reconstruction; Giant cell reparative granuloma; Mandibular condyle cancer

Giant cell reparative granuloma (GCRG) of the jaw was previously diagnosed as Giant cell tumour. In 1953, GSRG was first proposed by Jaffe (1) as a non-neoplastic fibrous lesion with multinucleated giant cell of jaw bone. The mandible is the most frequently affected bone, particularly at the anterior region (2). The mandibular condyle is rarely affected and only a few cases have been reported in the literature (3-5). To our knowledge, there is no article in the literature describing the long-term result of reconstruction following resection of GCRG at the condyle. The present article describes an unusual case of GCRG of the condyle and the long-term result of reconstruction after surgical resection of this rare entity.

CASE PRESENTATION

A 37-year-old Asian woman was admitted to the Chang Gung Memorial Hospital (Taoyuan, Taiwan) with a six-month history of an enlarging mass over the left pre-auricular area. Physical examination revealed a firm, bony mass approximately 4 cm × 3 cm in size at the anteroinferior position of the left pre-auricular area. The lesion was palpable, but was not clearly visible on appearance. The mass was hard in consistency, immobile and regular in contour. Oral examination revealed a bulging mass over the retromolar area. Computed tomography (CT) of the head revealed a 4 cm × 3 cm ballooning cystic bony lesion that involved the left condyle, neck of condyle and upper ramus

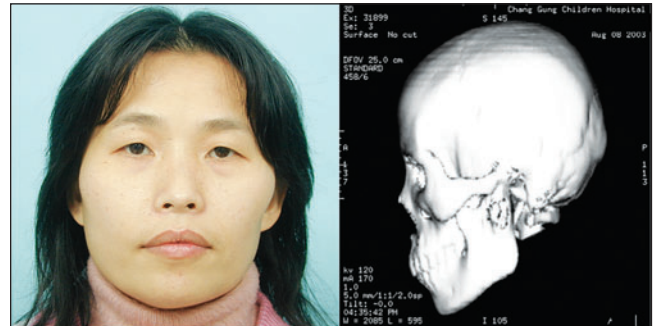


Figure 1) A 37-year-old Asian woman presented with a firm, bony mass approximately 4 cm × 3 cm in size at the anteroinferior position of the left pre-auricular area. Computed tomography of the head revealed a 4 cm × 3 cm ballooning cystic bone lesion that involved the left condyle, neck of the condyle and upper ramus of the mandibular region. It involved both the inner and outer cortices with mixed linear radiolucent and radiopaque areas

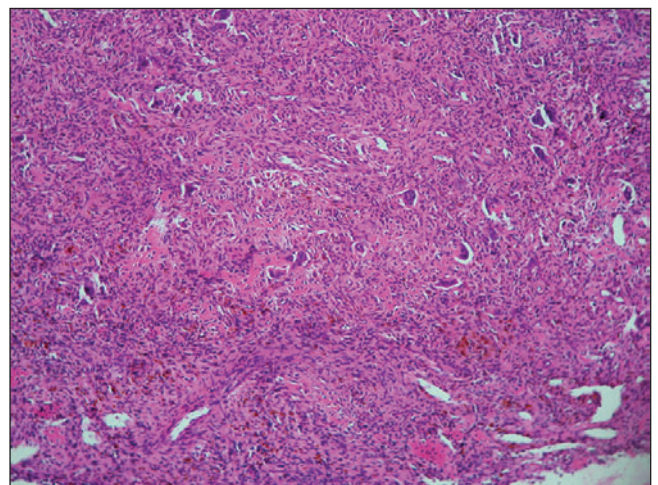


Figure 2) Microscopically, the tissue section revealed the presence of multinucleated giant cells in the background of oval to spindle cells. Hematoxylin and eosin stain, original magnification ×150

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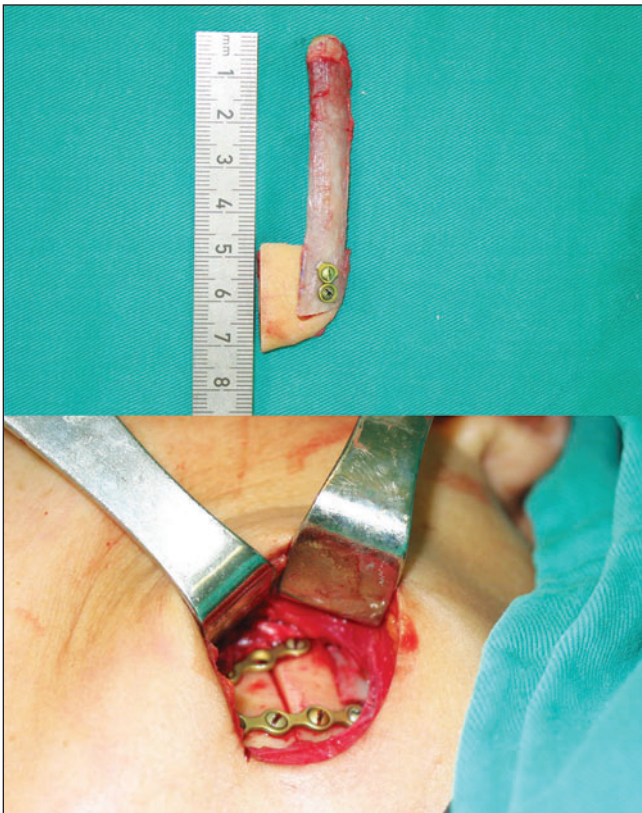


Figure 3) Top panel Free autologous osteochondral rib graft is fixed to the nondiseased lower segment. Lower panel The lower segment of ramus with the angle was restored to its original position and fixed with miniplates

of mandibular region that involved both the inner and outer cortices with mixed linear radiolucent and radiopaque areas in a granular fashion (Figure 1).

Under general anesthesia, the surgical resection was approached by the combination of pre-auricular and submandibular incisions to explore the left ramus and left condylar area. The skin and subcutaneous tissue were elevated and followed by periosteal elevation to explore the lesion. The facial nerves were well preserved. A vertical ramus osteotomy was performed to remove the tumour.

Macroscopically, the tumour was red and hemorrhagic, with destruction of inner and outer tables of the condyle, neck of the condyle and the upper ramus of the mandible. The lower segment of the ramus and the angle of the mandible were disease free. Microscopically, the tissue sections revealed the presence of multinucleated giant cells in a background of oval to spindle cells (Figure 2). The patient recovered uneventfully from surgery. The condyle and ramus was reconstructed using autologous costochondral graft harvested from right seventh rib (Figures 3 and 4).

Postoperatively, patient had proper mouth opening with satisfactory occlusion and maximal interincisal distance beyond 35 mm. No tumour recurrence or distant metastasis occurred during the subsequent 10 years of follow-up with physical examination, orthopantomograms, cephalometric x-rays and cranial CT investigation. The patient remained satisfied with the functional and aesthetic outcomes of the surgical procedure at 10-years' follow-up (Figure 5). Clinically, the patient has shown long-term maintenance of mandibular alignment and facial form with a stable occlusion.

DISCUSSION

GCRG was first described by Jaffe (1) as a locally reparative reaction of bone possibly due to an inflammatory response, hemorrhage or local trauma. GCRG is commonly diagnosed during the first two decades of

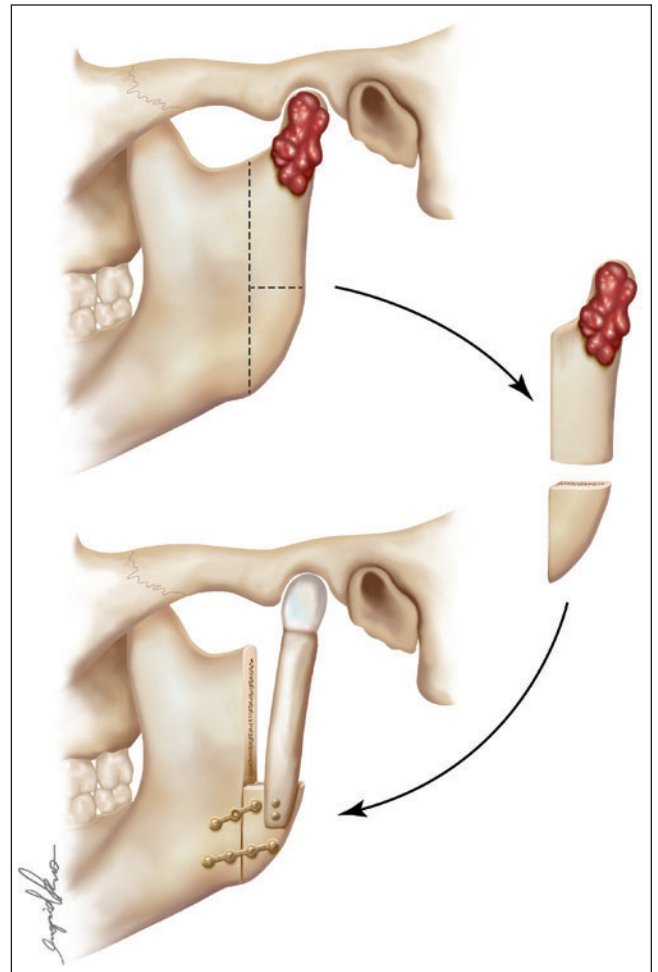


Figure 4) Diagram of condylar reconstruction. A vertical split ramus osteotomy to remove the ramus and the condyle. The tumour involving the left condyle and the upper part of the ramus was removed en bloc with a good margin of clearance. Reconstruction was performed with a free autologous, osteochondral rib graft, which is fixed to the nondiseased lower segment of the ramus by miniplates and screws. The cartilage end of the rib graft is strategically position at the fossa. The lower segment of the ramus with the angle of the mandible was restored to its original position so that the original angle of the mandible is not compromised

life (1). Females are affected more than males (6,7). GCRG is considered to be more common in the mandible than in the maxilla. The majority of cases occur in the molar-premolar area and could extend to the ramus (7,8). Involvement of the condyle is rare (3-5,9).

Some cases are asymptomatic (8); however, the most common presentation of GCRG is a painless expansile mass in the face or the oral cavity (10). Additionally, $\geq 20\%$ patients experience pain or paresthesia (1,6,11). Other symptoms may include facial asymmetry, loosening or displacement of teeth, and pathological fractures (12).

The treatment modalities most frequently used are enucleation, curettage alone or en bloc resection whenever possible (13). Other treatment modalities include intralesional injection of corticosteroid (14,15) or human calcitonin injection (16). Radiotherapy should be avoided because of theoretical risk of long-term malignant transformation (17,18).

The goals of reconstruction of a mandibular defect involving the condyle are to achieve a stable articulation and regain continuity, as well as restoring facial form and dental occlusion. There is ongoing controversy regarding the best way to reconstruct the condyle, whether to use autogenous tissues or alloplastic materials. However, in

our experience, costochondral rib graft remain the preferred method of reconstruction. This is mainly because we are able to achieve consistently good results that are shared by others (19-21).

Alloplastic replacement of the mandibular condyle has obvious additional advantages including rigid stabilization, lack of donor-site morbidity, an unlimited supply of prostheses and the ability to initiate early physical therapy. However, its applications have other concerns and potential disadvantages. There is an overall 10% complication rate with metallic alloplastic condylar heads including pain, loose plate, limited jaw opening and plate exposures in irradiated patients (22). Moreover, the alloplastic metallic condylar head is very expensive and some have shown that alloplastic prosthesis is not a suitable option for temporomandibular joint reconstruction(s) (23). Other concerns include the most feared complications of temporal bone erosion into the middle cranial fossa or intractable pain, which has been reported with some total temporomandibular joint prostheses and in tumour-related plate placements (22). Recently, Tang et al (24) reported a superior result using a prefabricated titanium implant when compared with costochondral graft. However, if the technique was to be applied in the present case, we would have needed to create a larger operative wound to insert titanium plates as illustrated in the publication (24).

In our experience, costochondral rib grafts have been used for reconstruction of the condyle with good success and have remained our preferred method of condylar reconstruction following tumour resections, traumatic injuries or congenital abnormalities. Intraoperative temporary maxillomandibular fixation is recommended.

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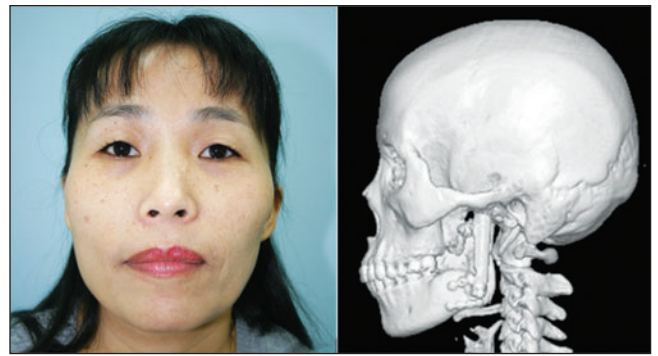


Figure 5) Patient remained well 10 years after reconstructive surgery. Three-dimensional computed tomography revealed a stable costochondral graft. There is minimum contour irregularity at the left preauricular and mandibular regions. Mouth opening beyond 35 mm is achieved with minimal deviation and centric occlusion is satisfactory

In the present case, the surgical treatment was successful, with complete tumour resection and patient has demonstrated good long-term functional and aesthetic outcomes following condylar reconstruction with autologous costal cartilage bone graft.

DISCLOSURES: The authors have no financial disclosures or conflicts of interest to declare.