CASE REPORT

Reconstruction of a large central giant cell granuloma with combined soft and hard tissue augmentation procedures

Büyük santral dev hücreli granülomanın yumuşak doku ve sert doku ogmentasyonu ile rekonstriksiyonu

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SUMMARY

The central giant cell granuloma is a nonodontogenic, intraosseos lesion accounting for fewer than 7% of all benign tumours of the jaws. The aggressive types of the lesions have a tendency to recur after excision and require wide resection. Resection of the mandibular lesions may result in oral function deficiency and aesthetic or psychological problems. In this article, the reconstruction of a case with destructive giant-cell granuloma with tissue expander, iliac bone graft, dental implant and free gingival graft is presented.

It is crucial to totally eliminate the aggressive lesion and reconstruct the bone defect for acceptable aesthetic and functional results. The present case emphasizes the success of soft and hard tissue augmentation procedures in the management of a large aggressive benign tumour.

Key words: Alveolar ridge augmentation, iliac graft, tissue expansion devices, giant cell granuloma.

ÖZET

Santral dev hücreli granuloma, benign karakterli ancak lokal-agresif seyir gösteren intraosseöz, nonodontojenik bir lezyondur. Lezyonun agresif tipte olması, tedavi sonrası rekürens oranını arttırmakta ve tedavide geniş rezeksiyon yaklaşımının tercih edilmesine neden olmaktadır. Bu makalede, dekstrüktif bir santral dev hücreli granuloma olgusunun yumuşak doku genişletici, iliak kemik grefti, dental implant ve serbest diş eti grefti ile rehabilitasyonu sunulmuştur.

Çene kemiğinde agresif olarak ilerleyen geniş lezyonların tedavisinde, lezyonun eksizyonu ile rekürrens oranının azaltılması ve oluşan defektin estetik ve fonksiyonel olarak rekonstrüksiyonu önem taşımaktadır. Bu raporda, lokal agresif seyir gösteren santral dev hücreli granülom olgusunda, yumuşak ve sert doku ogmentasyon prosedürlerinin başarısı vurgulanmaktadır.

Anahtar kelimeler: Alveolar kemik ogmentasyonu, iliak greft, doku genişletme apareyi, dev hücreli granülom.

INTRODUCTION

The central giant cell granuloma (CGCG) is a proliferative, nonodontogenic, intraosseos lesion accounting for fewer than 7% of all benign tumours of the jaws (1). It has an unknown etiology but its origin could be triggered by trauma, inflammation or hemorrhage. The clinical and radiographic findings are not specifically diagnostic. Although it has a low malignite potential, its clinical behavior ranges from slow-growing, asymptomatic swelling to an aggressive lesion which manifests with swelling, pain, rapid growth, bone expansion, tooth displacement, root resorption and neurosensory disturbances. The radiologic features of the CGCG comprise a unilocular or a multilocular radiolucency with varying degrees of expansion of the cortical plates (2-4).

This clinical report describes the reconstruction of a case with destructive giant-cell granuloma with tissue expander, iliac bone graft, dental implant and free gingival graft.

CASE REPORT

A 31-year old systematically healthy male patient was referred to our clinic because of his complaints about pain, swelling and paresthesia from a general dental practitioner. The patient had a history of trauma in the anterior region of the mandible due to a traffic accident five years ago. In his intraoral examination, tooth mobility and bone expansion on the vestibular side of his right mandible extending from 33 to 46 numbered tooth were diagnosed. Also, radiographic examination was revealed that, a radiolucent lesion had produced the destruction of lingual and buccal cortex of the mandible (Fig. 1).

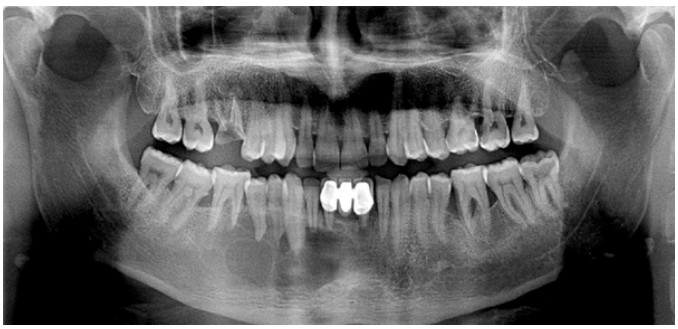

Figure 1. *Preoperative ortopantomograph shows a well-circumscribed large radiolucency extending from 33 to 46 numbered tooth.*

For the complete removal of the lesion, marginal mandibulectomy was performed under local anesthesia with an intraoral approach. There was only a thin layer of cortical bone left with no intact bone at the buccal and lingual cortical layer. The histologic appearance confirmed a central giant cell granuloma after histopathologic evaluation. Although, the differential diagnosis included fibrous dysplasia, cherubism, aneurysmal bone cyst, giant cell tumor of the long bones, neurofibromatosis type I, cherubism, and Noonan syndrome, the clinical, radiological, and laboratory tests of calcium and phosphate, parathormone, and alkaline phosphatase levels ruled out these conditions3. In addition, no genetic factors in his medical and family history were found. The patient was followed up on both clinically and radiographically for 48 months and after that the augmentation of the affected site was planned (Fig. 2). A 2,1 ml cylinder osmotic tissue expander (Osmed GmbH, Ilmenau, Germany) was inserted in a supraperiosteal mucosal pouch which was prepared using by blind dissection to increase the soft tissue volume and it was fixed to the bone with a titanium miniscrew.

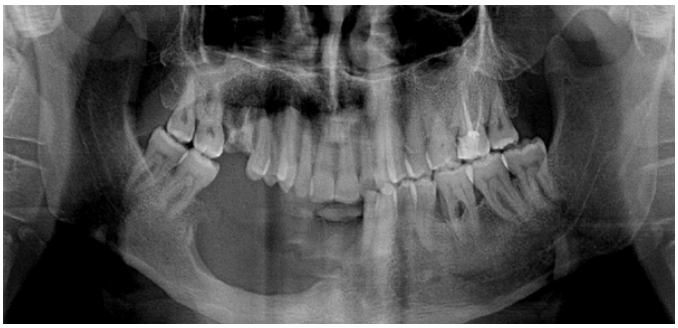

Figure 2. *Ortopantomograph shows no evidence of tumor recurrence after 48 months of the marginal mandibulectomy.*

Bone augmentation was carried out after 6–8 weeks of soft-tissue expansion, when the osmotic expander had reached its final volume. Augmentation of the bone defect was provided via an autologous bone graft harvested from the anterior iliac crest. After the primary closure of the donor site, the recipient site was exposed, and the tissue expander was removed. The bone graft was modified to fit the recipient site and fixed to the base of the defect with miniscrews and X-shaped miniplate (Fig. 3).

Clinical and radiographical evaluations showed a satisfactory soft and hard tissue gain after a 6 months of healing period (Fig. 4). After verification of graft integration, four dental implants were placed into the new alveolar bone and the treatment was completed with application of free gingival graft and prosthetic restoration (Fig. 5). Four years after the final restoration, neither any clinical and radiologic signs of recurrence of the lesion nor any complications like graft resorption were observed.

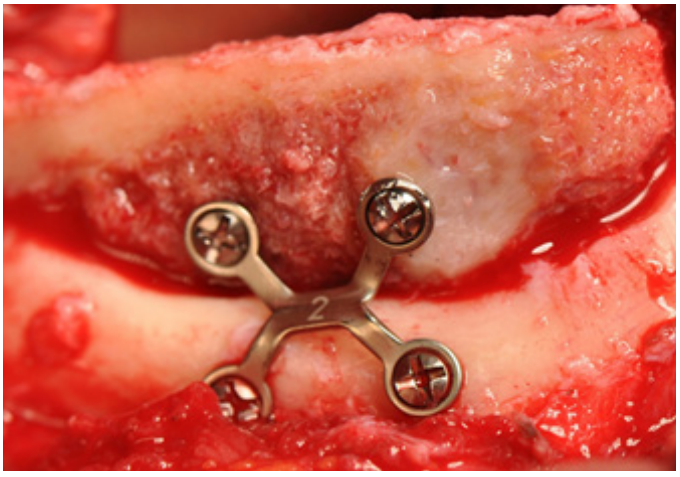

Figure 3. *The grafted iliac crest bone with fixation of a titanium miniplate and miniscrews.*

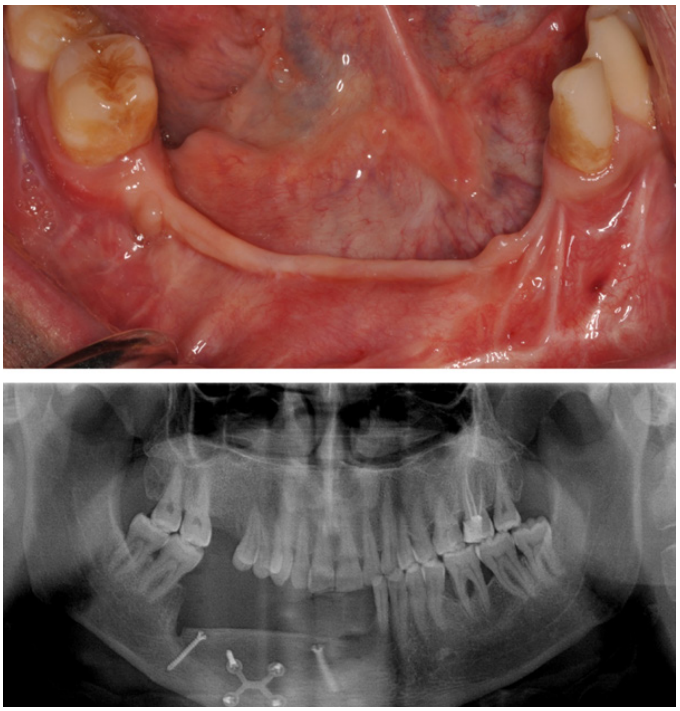

Figure 4. *Postoperative clinical and radiographical evaluations show a satisfactory soft and hard tissue gain.*

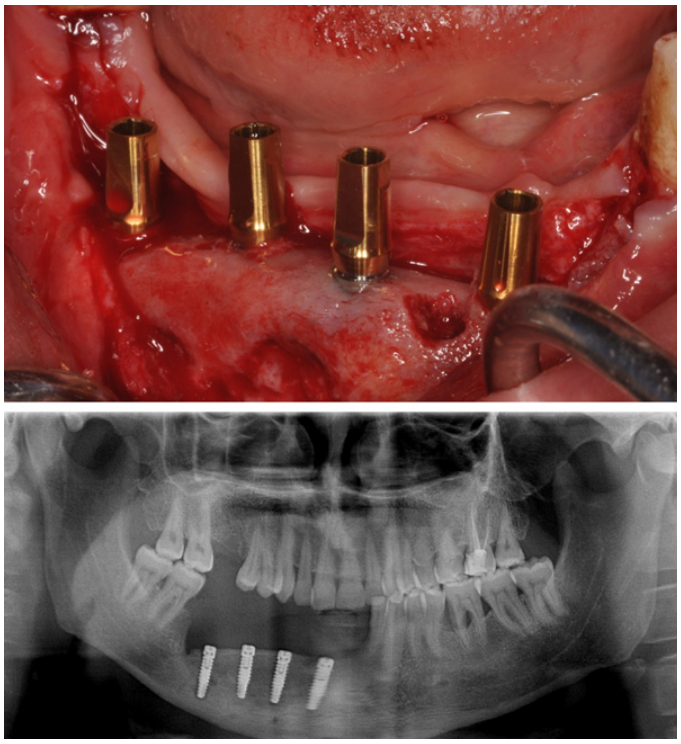

Figure 5. *Placement of the osseointegrated dental implants.*

DISCUSSION

CGCGs of the jaws have no significant potential for malignancy but they can be locally aggressive, with a high recurrence rate (5). Chuong et al. have classified CGCGs as aggressive and nonaggressive lesions based on biologic behavior, including the presence of pain, rapid growth, swelling, tooth root resorption, cortical perforation and a tendency to recur (6). The aggressive lesions are mostly found in younger patients. The exact etiopathogenesis of the lesion is still debated, though the role of trauma is often associated. Although, it frequently damage the jaws or teeth and tooth germs, surgical curettage or, resection in aggressive lesions, are still the most common treatment options; they provide the lowest recurrence rate (7-10). In this case, destructive and expansive mandibular lesion, which cause pain, edema, paresthesia and tooth mobility, was enucleated with marginal mandibulectomy and no complication was observed in the healing period. The patient had a previous history of trauma to chin, so the follow up of the trauma cases is important to diagnose the development of the such pathological lesions.

The mandible is a major component of the facial appearance and greatly contributes to orofacial function. Resection of the mandibular lesions may result in oral function deficiency and aesthetic or psychological problems. Using autogenous bone grafts is the gold standard for bone reconstruction, especially when reconstructed segments are loaded with dental implants (11,15). In this case, an iliac bone graft was used for the mandibular reconstruction because it reinforces the resistance of the mandible and provides adequate bone volume. There is no single technique for the surgical reconstruction of the mandible after tumour surgery; all methods have good results and prognosis with few complications and low morbidity rates. However, it is important to point out that there is only limited number of clinical reports describing the success rates of reconstruction of CGCG with iliac crest graft and dental implants (11-15).

An adequate soft tissue coverage is essential for a tension-free closure of the flap. A tension free closure of the flap also provides adequate vascularization and stabilization; this prevents later exposure of the bone graft which may result in the loss of the graft. On the other hand, no other cases include the soft tissue expanders after resection of aggressive benign tumours of the jaws were found in the literature.

Osmotic expanders increase their size by absorption of body fluids, eliminating the need for external fillings and are mechanically durable (16-20). There is a choice between supraperiosteal or subperiostal implantation of soft-tissue expanders. The subperiostal insertion of the soft tissue expander causes significant bone resorption; that is why the tissue expander was inserted into the submucosal space. Surplus of periosteum is not to be expected, as it is replaced by fibrous connective tissue in case of subperiosteally placed expanders and subperiosteal implantation causes significant resorption of the underlying bone. In addition, preparation of submucosal pouch is easy and well tolerated by the patient (21).

In present case, bone augmentation procedures were carried out and 6 months after implant insertion, an implant-supported bridge was built successfully. Neither any clinical and radiologic signs of recurrence of the lesion nor any complications associated with the implants were observed in four years follow up period. We assume that it is crucial to totally eliminate the aggressive lesion and reconstruct the bone defect for acceptable aesthetic and functional results consistent with the literature (22).

CONCLUSION

Considering the limited number of clinical studies on tissue augmentation procedures and placement of dental implants after the management of aggressive benign tumours in the literature, each new case may be important for documentation of contemporary strategies. This case highlights the proper choice of reconstructive and restorative treatments can result in appropiate functional and esthetic outcomes.

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