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*CASE REPORT*

# TREATMENT OF GIANT CELL GRANULOMA WITH INTRALESIONAL CORTICOSTEROID INJECTIONS: A CASE REPORT

## *Dev Hücreli Reparatif Granulomanın İntralezyonel Kortikosteroid Enjeksiyonu ile Tedavisi: Olgu sunumu*

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### *ABSTRACT*

*Giant cell granuloma is rare in the head and neck region and most commonly affects the maxilla and mandible. Giant cell granulomas are benign but occasionally aggressive lesions that are traditionally treated with surgery. Because it is a benign process, less radical and non-surgical treatment alternatives are required. Corticosteroid injection is a viable alternative in the treatment of central giant cell granuloma to avoid surgery. We aim to present a case which was successfully treated with intralesional corticosteroid injection in the maxilla.*

***Keywords:*** *Giant cell granuloma; intralesional corticosteroid injection; maxilla; nonsurgical treatment; surgical treatment*

### *ÖZ*

*Dev Hücreli Reparatif Granuloma (DHRG) baş boyun bölgesinde nadir görülmekle birlikte genellikle maksilla ve mandibulayı etkiler. DHRG selim bir lezyondur ancak genellikle agresif olup tedavisi geleneksel olarak cerrahidir. Lezyonun selim karakteri nedeniyle daha az radikal olan ve cerrahi olmayan tedavi şekilleri tercih edilmektedir. DHRG tedavisinde cerrahiden kaçınıldığı durumlarda kortikosteroid enjeksiyonu alternatif bir tedavi olarak düşünülebilir. Bu yayında amacımız; maksillada intralezyonel kortikosteroid enjeksiyonu ile başarıyla tedavi ettiğimiz bir olgumuzu sunmaktır.*

***Anahtar kelimeler:*** *Dev hücreli granuloma; intraleztonel kortikostreroid enjeksiyonu; üst çene; cerrahi olmayan tedavi; cerrahi tedavi*

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## Introduction

The giant cell granuloma (GCG) is an uncommon benign bony lesion which is usually located in the mandible or maxilla (1). It accounts for less than 7% of all benign lesions of the jaws in tooth-bearing areas (2)

World Health Organization defines GCG as an intra-osseous lesion consisting of cellular fibrous tissue that contains multiple foci of hemorrhage, aggregations of multinucleated giant cells and occasionally trabeculae of woven bone (3). The etiology of GCG still remains controversial. However, it is thought to be a reactive, inflammatory, infective, or neoplastic process (4). Histologically, multinucleated giant cells, in a cellular vascular stroma, and often new bone formations are detected like Brown tumor. GCG lesions are similar to those found in hyperparathyroidism, neurofibromatosis type 1, Noonan syndrome and Cherubism (5). GCG affects both children and adults. 75% of GCG patients are younger than 30 years. It is twice as frequent in females than males. It usually occurs in the anterior maxilla but may also be seen in the anterior or posterior mandible (6).The lesion may appear as an unilocular or multilocular radiolucency with well- or ill-defined margins; varying degrees of expansion and erosion of the cortical plates. Root resorption has been reported (7). GCG is divided into two categories according to its clinical behavior: aggressive and nonaggressive. The nonaggressive form is more commonly seen with characteristic slow-growth pattern and painless swelling. The agressive form is characterized by one or more of the following features; pain, paresthesia, root resorption, rapid expansion, cortical resorption and high recurrence rates after surgical curettage. The agressive form is mostly found in younger patients. There is no histological difference between agressive and nonagressive type. Size and number of giant cells may influence clinical behaviour of the lesions (7, 8). The common treatment of GCG is surgery. Simple curretage, curettage with peripheral osteotomy, en bloc resection and cryosurgery are surgical treatment options. 5 mm surgical margins that extend to healthy tissues are recommended to avoid recurrences. Aggressive lesions with cortical perforations have high recurrence rates. En bloc resection might provide the greatest certainty of a cure in aggressive GCG (9 ). Various authors proposed excision via curettage and reported overall recurrence rates that range from 16% to 49%. Recurrence rates have been associated with surgical technique and lesion characteristics (7, 10). Recently non-surgical treatments have been described and their benefits may be worthy of consideration . These are; subcutaneous alpha interferon, systemic and nasal spray calcitonin, corticosteroid injection and radiation exposure. Particularly in children, surgical approach may result in tooth loss, facial deformity including discontinuity defects, or sensory nerve deficits. In such cases non-surgical treatments would be more preferable (11). The aim of this report is to present a case with GCG in the maxilla who has been treated successfully with intralesional corticostreoid injections.

## Case report

A 42-year-old male patient admitted to our department with complaint of swelling in the left maxilla. There was no history of previous trauma or dental problems. The results of blood count and routine laboratory tests were normal. There was no systemic disease. Clinical evaluation revealed no evidence of cervical lymphadenopathy. The intra-oral evaluation revealed a non-ulcerated, firm, elastic vestibular swelling in his left edentoulous maxilla. Panoramic radiograph was non-contributory. The patient underwent computed tomography (CT) that revealed a hypodense, oval-shaped, unilocular, 1.5 cm in diameter, non-mineralized osteolytic lesion in the left maxilla (Figure 1). A preoperative intra-oral biopsy of the lesion revealed a morphology consistent with giant cell granuloma (Istanbul University Medical Faculty Department of Pathology No: 18240/2013). Brown tumours are identical to GCG both histologically and radiographically, but they were ruled out on the basis of normal serum levels of calcium, phosphorus, alkaline phosphatase and good renal function. Considering the size of the lesion, it was decided that surgical curettage would create a large defect that could hamper the use of removable prosthesis. Therefore, intra-lesional corticosteroid injection was presented as an alternative treatment. Patient was informed about the procedure and signed informed consent form was obtained.

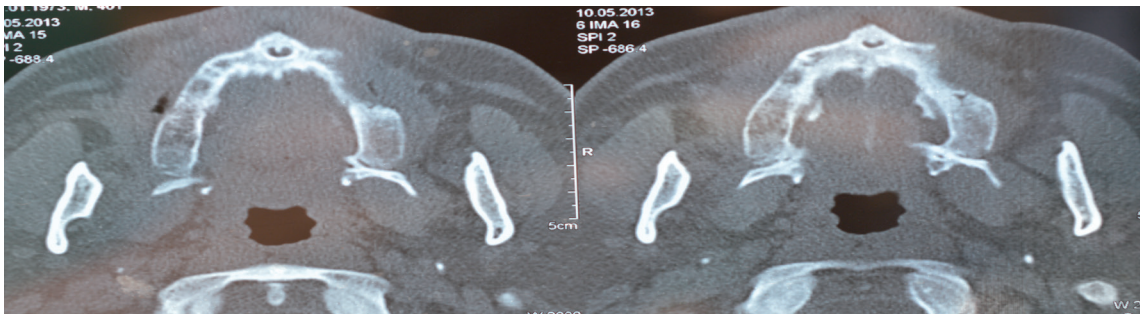


***Figure 1.*** *Patient's preoperative computed tomography, axial slices.*

1 ml of lidocaine without epinephrine (Jetokain Simplex, Adeka İlaç San. ve Tic. A.Ş, İstanbul, Turkey) ) and 1 ml of triamcinolone acetenoide (Kenacort-A 40 mg, Bristol-Myers-Squibb Pty Ltd., New York, NY, USA) were mixed and intra-lesional injection was performed in different areas of lesion once a week (Figure 2) for six weeks duration. Two weeks later, lesion's dimensions were observed to decrease and at the end of 6 weeks, lesion in the oral mucosa was not visible to naked-eye observation (Figure 3). At four month control no lesion was found in CT examination and new bone formation was apparent (Fig 4). Panoramic radiography obtained at one year follow-up revealed no recurrence of the lesion (Figure 5).

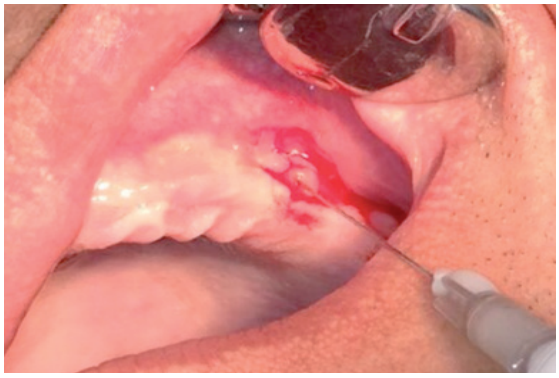

***Fig 2.*** *Intralesional corticosteroid injection.*

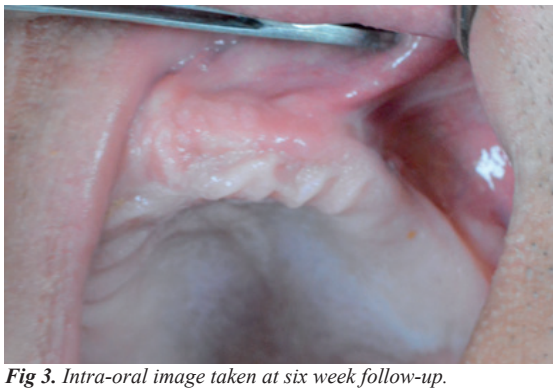

***Fig 3.*** *Intra-oral image taken at six week follow-up.*

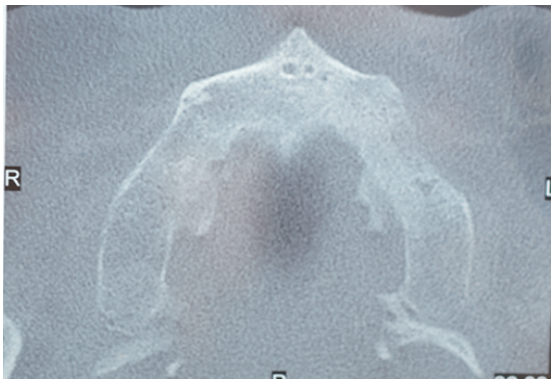


***Figure 4.*** *Computed tomography at 4 month follow-up.*

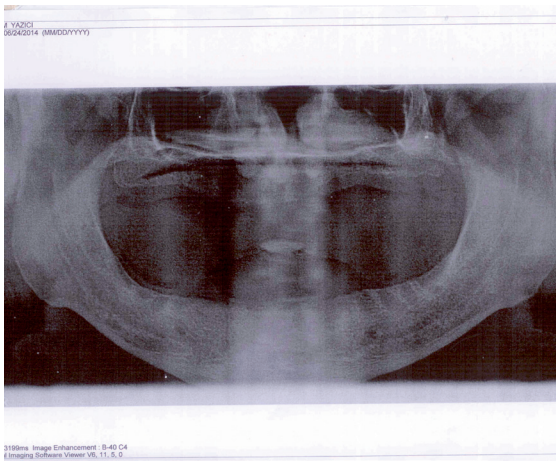

***Figure 5.*** *Panoramic radiograph taken at 1 year follow-up.*

## Discussion

The conventional therapy of GCG is enucleation or resection. This approach, however, is often associated with recurrences rates that range from 19% to 49% (10). Aggressive curettage and en bloc resection may decrease this ratio but, in case of large lesions, it also results in large tissue defects. Loss of teeth and/or germs in young patients are often unavoidable consequences**.** Therefore, non-surgical

treatment options are recommended. Nonsurgical methods, such as radiotherapy, daily systemic doses and nasal calcitonin spray, intra-lesional injections with corticosteroids, subcutaneous interferon alpha and bisphosphonates were used (11). The use of radiotherapy has been previously reported but has also been frowned upon because of its the significant potential for side effects. This treatment has been suggested to possibly initiate malign transformation (13, 14). Bisphosphonate could be used for GCG and fibrous dysplasia treatments in children. Bisphosphonates inhibit the formation of osteoclasts from immature precursor cells and induce the apoptosis of mature osteoclasts (15). Interferon alpha is generally used for the treatment of vascular lesions treatment but it could be also employed for treatment of agressive GCG successfully (16). Subcutaneous injection of interferon alpha could be used for metastatic and locally agresive lesions with non-resectable margins as well as palliative treatment in GCG (17). Harris (18) was first to report the use of calcitonin (administered subcutaneously or as a nasal spray) to treat central giant cell tumors of the jaws. This author stated that the use of calcitonin was based on the hypothesis that giant cells of the GCG lesion were osteoclasts and therefore would be immobilized by calcitonin. Allon *et al.* (19) used nasal spray calcitonin 200 u twice daily for 2 to 5 years in children and young adults successfully and no adverse effect or recurrence have been reported. However, in a randomized controlled trial (20), calcitonin nasal spray was found unsuccessful. Pogrel *et al.* (21) have used calcitonin in the treatment of Brown tumors and suggested that randomized control clinical trials should be conducted to determine the efficacy of calcitonin nasal spray. Flanagan *et al.* (22) reported that the multinucleated cells in giant cell granuloma are mainly osteoclasts. Corticosteroids inhibit osteoclasts in bone marrow cultures by promoting apoptosis which leads to decrease in bone resorption. Jacoway *et al.* (23) were first to report the use of corticosteroid injection to treat central giant cell tumors of the jaws and they proposed this treatment modality as an alternative to surgery. Kermer *et al.* (24) reported the use of corticosteroid injection to treat central giant cell tumors. Terry and Jacoway (12) reported their findings after 6 months of corticosteroid injection. Osteoclasts participates to the extracellular production of lysosomal proteases and bone resorption. According to Carlos and Sedano (25) intra-lesional corticosteroid injection inhibits bone resorption via two different pathways: inhibition of the extracellular production of lysosomal proteases (which mediate osteoclastic bone resorption) and steroidal apoptotic action on the osteoclast-like cells (MNGCs). Kurtz *et al.* (26), have injected a mixture that consists of equal amount of triamcinolone acetonide (10 mg/mL) and a local anesthetic (bupivacaine 0.5% with epinephrine 1:200,000). The suggested dosage is 2 mL per 2 cm of radiolucency and the injections should be administered in multiple locations once a week, for at least 6 weeks. In other studies concerning the use of corticosteroid injections, authors suggested that 6 month to 3 years of treatment period is required for giant cell granuloma (11). Presence of calcified tissue has been reported after 2 years of treatment (12).

Our protocol was similar to those of Terry and Jacoway (12), Kermer *et al.* (24), and Rajeevan *et al.* (27) who had suggested weekly injections for 6 weeks duration for the treatment of giant cell granuloma. At the end of 6 weeks, the lesion in our case was found to disappear, at least, in the intra-oral examination. At 4 month follow-up CT, the area previously occupied by the lesion was observed to be filled with mineralized tissue. Moreover, there were no signs of recurrence at 1 year follow-up. Suppression of adrenal hormone production occurs when sufficient amount of corticosteroid is administered daily; however, our patient received weekly low dose of steroid theraphy that did not alter adrenal gland functions. Our patient did not experience any side effects related to the steroid treatment. Before the treatment, biopsy must be obtained to establish the diagnosis. Blood levels of parathyroid hormone, calcium, and phosphorus should be determined to rule out hyperparathyroidism (28).

## Conclusion

The treatment of GCG with intra-lesional injections of corticosteroids can be used as an alternative to surgery, especially in large lesions which may compromise vital structures. This technique is well-tolerated and non-invasive. However, the lack of well-established protocols, especially in terms of drug dosage and treatment duration, warrants further controlled clinical trials which focus on long term follow-up and recurrence rates.

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None declared

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