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Case Report

Surgical Management of Mandibular Central Giant Cell Granuloma: A Case Report

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ABSTRACT

Central giant cell granuloma (CGCG) is a benign intraosseous, it is a nonneoplastic lesion that is found particularly in the maxilla and mandible, with higher rate in the mandible. Although the etiology is uncertain, it is assumed to be caused by trauma, inflammatory processes, or genetic factors. The biologic behavior of CGCG of the jaws ranges from a quiescent, indolent asymptomatic lesion with slow growth and low recurrence rate, to an aggressive pathological process, characterized by pain, rapid growth, root resorption, cortical perforation, and a high recurrence rate. A rapid diagnostic assessment, together with an adequate histopathologic verification, is essential to improve the management and the prognosis of this locally destructive lesion. In this case report, a 63-year-old female patient complaining of a lower left side mandibular swelling measured (3x3cm) for two months undergone radiographic investigation. Images revealed a mandibular left side lesion with characteristic features that were highly suggestive of CGCG. The patient undergone excisional biopsy, and the subsequent histopathological examination confirmed the diagnosis of CGCG. Postoperative recovery of the patient was smooth and uneventful. The mild postoperative pain and edema were controlled with analgesic anti-inflammatory drugs, and the patient was placed on intravenous broad-spectrum antibiotics for 5 days, The surgery and recovery were uneventful.

Keywords: Central Giant Cell Granuloma, Giant Cell Tumor.

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ورم الخلايا العملاقة المحبب العظمي (CGCG) هو ورم حميد داخل العظم، وهو ورم غير سرطاني أو غير خبيث يوجد بشكل خاص في الفك العلوي أو الفك السفلي مع نسبة أعلى في الفك السفلي، على الرغم من أن المسببات غير مؤكدة فمن المفترض أن يكون سببها التعرض للكدمات أو العمليات الالتهابية أو العوامل الوراثية. يتراوح السلوك البيولوجي لي ورم الخلايا العملاقة المحبب العظمي في الفكين من الاورام هادئة خاملة التي بدون أعراض مع نمو بطيء ومعدل تكرار منخفض إلى أعراض عدوانية تتميز بالألم والنمو السريع وإذابة الجذور وثقب طبقات العظم ومعدل تكرار مرتفع، يعد التقييم التشخيصي السريع إلى جانب التحقق من النسيجي المرضي ضروريًا لتحسين الاستجابة لي العلاج من هذه المرض المدمر للأنسجة المحيطة, في هذا التقرير لي مريضة تبلغ من العمر 63 عامًا تشكو من تورم في الفك السفلي بالجانب الأيسر مقاس (x33 سم) منذ شهرين وخضعت للفحص الشعاعي. كشفت الصور عن تورم في الجانب الأيسر من الفك السفلي ذات سمات مميزة تشير إلى حد كبير إلى وجود ورم الخلايا العملاقة المحبب العظمي , خضعت المريضة لي استئصالية كلي لي الورم، وأكد الفحص النسيجي اللاحق التشخيص بي الورم الخلايا العملاقة المحبب العظمي. كان تعافي المريض بعد العملية الجراحية سلسًا وهادئًا. تمت السيطرة على الألم الخفيف والوذمة بعد العملية الجراحية بأدوية مسكنة وتم وضع المريض على المضادات الحيوية واسعة النطاق عن طريق الوريد لمدة خمسة أيام وكانت الجراحة والشفاء من غير مضاعفات.

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INTRODUCTION

Central giant cell granuloma (CGCG) is a benign intraosseous lesion first described by Jaffe [1]. CGCG is also described as an intraosseous lesion consisting of cellular fibrous tissue that contains multiple foci of hemorrhage, aggregations of multinucleated giant cells, and some trabeculae of woven bone [2]. It is a nonneoplastic lesion that is found particularly in the maxilla and mandible, with higher rate in the mandible. Although the etiology is uncertain, it is assumed to be caused by trauma, inflammatory processes, or genetic factors [3]. CGCG is mainly appeared in children or young adults, with a predilection for females , Though it is more common in young individuals, it can be diagnosed in advanced ages with slow progressing course [4, 5].

Central giant cell granuloma (CGCG) is a rare, non-cancerous bone lesion with aggressive local behavior, the biologic behavior of CGCG of the jaws ranges from a quiescent, indolent asymptomatic lesion with slow growth and low recurrence rate, to an aggressive pathological process, characterized by pain, rapid growth, root resorption, cortical perforation, and a high recurrence rate [6] .

Its exact cause is uncertain, with theories suggesting it could be a reactive or inflammatory lesion, rather than a tumor originating from tooth tissues. Despite efforts to understand its origins through various methods, the exact nature of CGCG remains unclear [7].

CGCG can be divided into two subclasses aggressive and non-aggressive [8]. The non-aggressive is the most common subtype, presenting as a slow-growing, painless lesion with the expansion of the cortical bone. In contrast, aggressive giant cell granulomas tend to appear in younger patients with the following possible features: greater than 5 cm in size, rapid growth, root resorption, tooth displacement leading to malocclusion, cortical bone thinning or perforation, and recurrence after curettage [9–10].

Radiologically, the CGCGs frequently presented as unilocular lesions with well-defined and ill-defined margins. CT demonstrates lesion margins and trabeculation [11]. Radiological findings of CGCG are diverse, ranging from a small unilocular lesion to large multilocular lesions with the displacement of teeth and tooth germs, root resorption, and cortical perforation [12].

CGCGs can be classify according to treatment options as surgical and nonsurgical. Non-surgical treatment options include radiation therapy, systemic injections of calcitonin [13], intralesional steroid injection [14], and denosumab treatment Furthermore, surgical options vary from simple curettage to major excisional and reconstructive surgeries such as maxillectomy or mandibulectomy with proper reconstruction, depending on the size, location and radiological features of the lesion [15, 16].

METHODS

In this case report, a 63-year-old female patient complaining of a lower left side mandibular swelling measured (3x3cm) for two months. An intraoral examination [Figure 1] revealed a solitary swelling in the left lower mandibule measuring approximately 3x3cm extending from distal aspect of the canine with significant vestibular obliteration in relation to premolar area. The overlying mucosa appeared pink to erythematous. The swelling was firm in consistency. For further examination cone beam computed tomography [Figure 2] and excisional biopsy were prepared, the subsequent histopathological examination confirmed the diagnosis of CGCG. The surgery and recovery were uneventful.

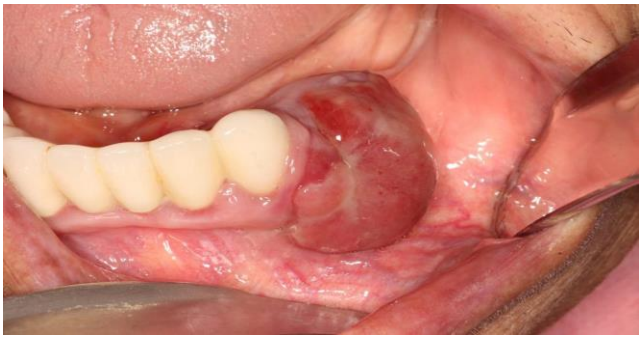

Figure 1: Preoperative giant cell granuloma of mandible viewed from the lateral aspect depicting its relationship to adjacent teeth.

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Radiographic features

Radiographic examination revealed Sharply demarcated radiolucency extends later to the distal surface of canine demarked with bone desorption and scalloped margins. Few cases exhibit sclerotic margin denoting the slow expansile nature. Sometimes, faint calcifications are noticed depicting the poorly mineralized osteoid trabeculae within the lesion and this helps to differentiate from giant cell tumors [17]. The root of canine is not resorbed, but the tooth may be lost due to lack of bony support. Larger lesions may exhibit multilocularity.

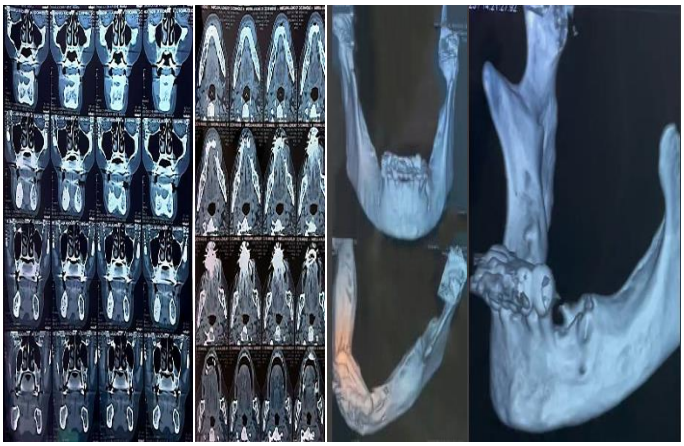

Figure 2: Postoperative computed tomographic revel mandibular alveolar ridge with residual bony defect.

Different diagnosis

Tests were immediately carried out for assessing the serum calcium, alkaline phosphatase, and serum parathormone levels, to rule out Brown's tumor of hyperparathyroidism, Serum calcium level was found to be 9.5 mg/dL (normal range 8.8–10.6 mg/dL); serum parathormone level was found to be 40.5 pg/mL (normal range 12–88 pg/mL); and serum alkaline phosphatase level was found to be 288 U/L (normal range 54–369 U/L). Thus, Hyperparathyroidism was hence ruled out.

RESULTS

Histopathology results

Section microscopic examination revealed multiple tissue fragments with numerous osteoclasts like giant cells near hemorrhagic area, cellular vascular and fibrous stroma, new bone formation at the edge of the lesion, with frequent mitotic figures, with no evidence of necrosis [Figure 3].

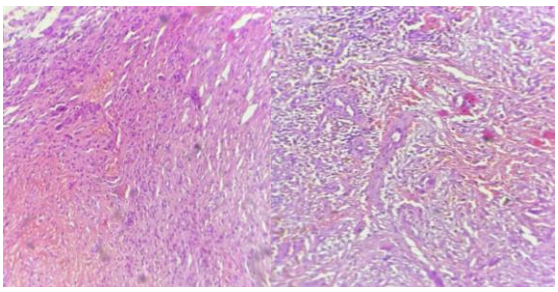

Figure 3: Photomicrographs at (a) 400x and (b) 1000x of haematoxylin- and eosin-stained slides showing sheets of (a) stromal cells and (b) multinucleated giant cells

Treatment

After routine workup, patient was taken up for surgery under local anesthesia. Enucleation of the lesion followed by aggressive curettage and peripheral ostectomy was planned [Figure 4].

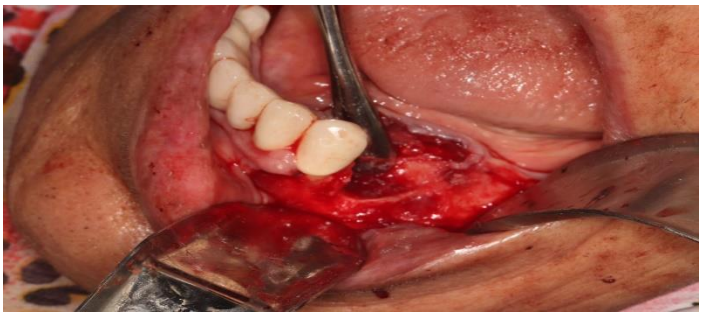

Figure 4: Preoperative giant cell granuloma of mandible viewed during surgical procedure.

DISSCUSION

The histological diagnosis is confirmed by fibroblastic stroma with spindle-shaped cells and multinucleated giant cells. Most widely used

intervention for CGCG is curettage. It ranges from simple curettage to resection in addition to cryosurgery and peripheral ostectomy. En bloc surgical resection with a 5-mm margin has shown to be the one with lowest recurrence [18].

Despite the availability of several medical treatments, surgery remains the most crucial step in the treatment of disease today. The type of surgery is determined by considering factors such as the lesion's location, shape, size, and invasion of the surrounding tissues. Although non-surgical treatments are crucial for a patient's quality of life, surgery may be recommended in situations when non-surgical treatments have failed or are ineffective.

Recurrence rates have been reported to range between 11% and 49%. (19) This wide range is attributed to the spectrum of lesions that extends from the more common small painless non-aggressive lesion to the less common large painful and aggressive lesion.

Thus, aggressive lesions, should be managed by complete surgical resection to decrease the risk of recurrence. The difficulty, however, lies in determining the degree of aggressive behavior before surgery.

CONCLUSION

A complete elimination of the neoplasm is the next step and is the key to successful management of the CGCG, which can otherwise lead to extensive bone destruction, resulting in considerable cosmetic deformity as well as functional debility.

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