

Chronicle of Central Giant Cell Granuloma

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Abstract: *Central giant cell granuloma (CGCG) earlier was known as the giant cell tumor of bone (GCT). Many investigators believe CGCG as a different entity and studied it extensively to suggest the differentiation between the two lesions based on histomorphological details. Many of them have studied the giant cells of both lesions in the broad range including the size, number of nuclei and distribution pattern. This review aims to discuss the evolution of CGCG as a separate lesion along with its clinical and histopathological details.*

Keywords: CGCG, Giant cells, Reparative granuloma

1. Introduction

Central giant cell granuloma (CGCG), once contemplated a giant cell tumor (GCT) was nominated as a separate entity by Jaffe in 1953. He proposed the terminology “giant cell reparative granuloma” for giant cell lesions of the jaws based on the fact that these are not true neoplasm, indeed represents a reparative reaction and it only mimics the bona fide GCT.^{1,2}

The concept was widely accepted; Austin and coworkers also agreed with the separation of CGCG from GCT, the latter mainly occurs in long bones. They remarked that GCT occurs rarely in jaws.³ Later on, the term “reparative” was banished as the actual nature of the lesion was found to be destructive and the entity was named as “Central giant cell granuloma.”⁴

The peripheral giant cell granuloma which may be reactive due to local irritants or trauma clinically differs but histologically similar to its central counterpart. The former appears to be more frequent in jaws than CGCG.^{5,6}

2. Historical Review

As discussed earlier, Jaffe renamed the jaw lesion as a giant cell reparative granuloma.¹ Shklar and Meyer noted that the use of term reparative granuloma to all the central jaw lesions is ambiguous and postulated that some and not all the giant cell lesion of jaws are inflammatory with an abnormal healing response.⁷

According to Waldron and Shafer, a lesion that is not odontogenic in origin should occur in other bones of the skeleton as well. Highlighting the points of separation between the two lesions mainly age and recurrence rate they discussed that the difference in the age group is because any lesion of jaws will be discovered earlier compared to other locations. Since the lesion in bones other than jaws is being there for longer duration it accounts for a comparatively larger size and higher recurrence rate also.⁶ Abrams and Shear histologically compared the giant cells in both the lesions and concluded that the giant cells in GCT were larger with more number of nuclei than that of CGCG. Furthermore, they have also found that few giant cells in GCT were even smaller than seen in CGCG while contrarily features were seen in some cases of CGCG too.⁸

Chuong et al described the two clinical subtypes; aggressive and non-aggressive along with the differentiating points between them based on the clinical and biological behavior.⁹ Auclair et al have studied the CGCG and GCT on clinical and histomorphologic grounds and stated that the overlapping features among them indicate that the GCT and CGCG represent a continuum of a single disease process modified by the age of the patient and the site of occurrence and possibly by other factors.⁴

Clinical Features

CGCG mainly affects females than males with most of the cases occurring below thirty years of age. The mandible is predominantly affected than maxilla although in both the jaws, anterior segment crossing the mid-line is characteristic.^{1,2,4,7}

Based on biological behavior it can be divided into i) Aggressive and ii) Non-aggressive lesions. In aggressive lesions, pain, paraesthesia, rapid growth, and cortical plate perforation along with root resorption are commonly seen. In non-aggressive lesions, no or minimal symptoms are generally seen.⁹

Radiographic Features

Most cases show multi-locular appearance exhibiting honeycomb pattern, with a well-demarcated border. Aggressive lesions have large size comparatively than non-aggressive subtypes which is generally an incidental finding on the routine radiograph.^{2,3,9}

Histopathology

Giant cells, the most distinct and integral component of the lesion are unevenly distributed throughout in diffuse and patchy forms.^{6,9} The size ranges from small to moderate with few to dozens of nuclei, eosinophilic abundant cytoplasm. Giant cells often show clumping near hemorrhagic areas.^{7,10}

(Fig. 1. a, b)

The stromal cell resembling fibroblasts varied in shape from spindle to ovoid with pale eosinophilic cytoplasm and round nuclei. The cells are distributed throughout the lesions in diffuse or loose patterns among the tumors.^{4,6} Mitoses are a common feature in cells and its frequency increase when stromal cells are diffusely packed directly co-relating with aggressive behavior.^{2,4,12} The connective tissue shows myxomatous or collagenous appearance with an ovoid-shaped stromal cell a more frequent feature associated with former appearance.^{6,13,14} (Fig. 1. c)

Ultrastructurally, stromal cells are joined by protoplasmic processes forming an interlacing network.⁷

Few stromal cells contain more nuclei and thought to represent a stage between mononuclear stromal cells to multinucleated giant cells. Extravasated RBC and hemosiderin pigment is a constant feature associated with the lesion, seen even more in recurrent cases.^{2,8,10} (Fig. 1. d) Prussian blue stain can be done to detect the presence of iron in lesional tissue.⁹

Foci of osteoid or woven bone are generally seen in orderly fashion although its distinction from peripheral reactive bone is difficult.¹

3. Summary

CGCG is a reactive lesion mainly occurring in the younger age group having two clinical subtypes based on biological behavior. The distinction is needed because the aggressive lesions have a comparatively higher recurrence rate than that of non-aggressive lesions which will affect the prognosis.

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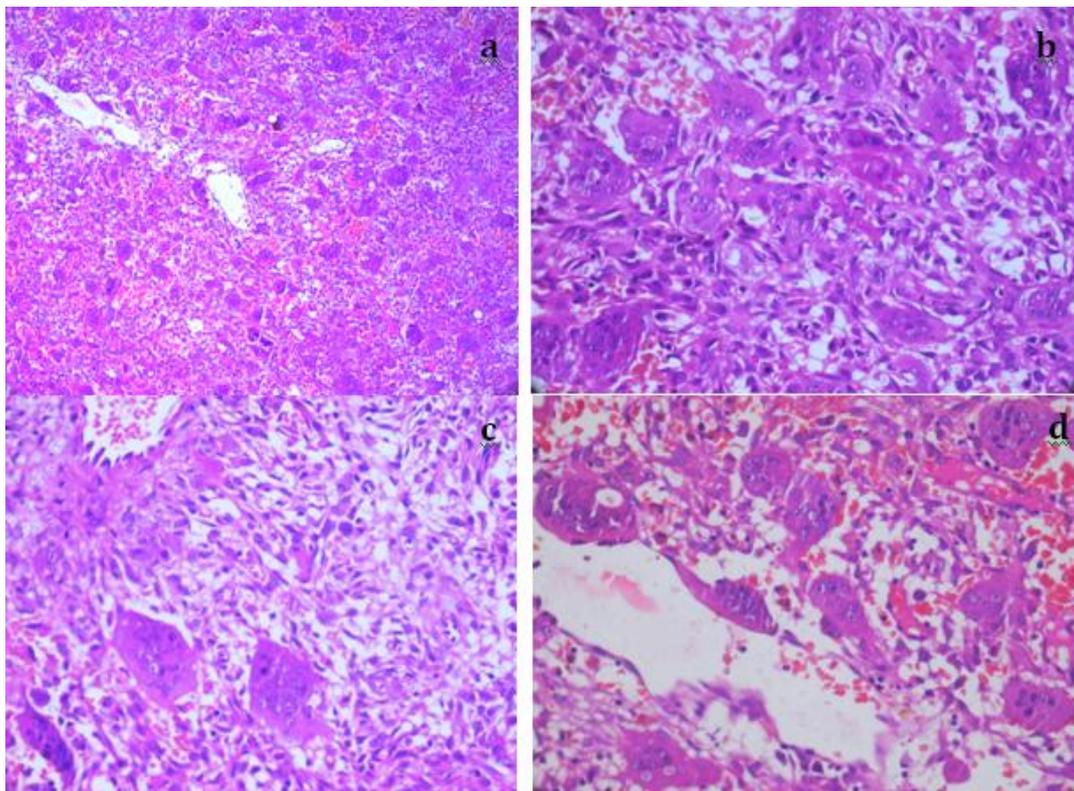


Figure 1: a. CGCG shows numerous giant cells in diffuse form.(H&E, low power) b. Numerous multinucleated giant cells predominating the stromal cells. (H&E, high power) c. Stromal cells mainly spindle shaped resembling fibroblasts. (H&E, high power) d. Areas of haemorrhage and hemosiderin pigment near to giant cells (H& E, high power)

