

## CASE REPORT

# Hybrid lesion: central giant cell granuloma and benign fibro-osseous lesion

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Hybrid lesions comprise elements of different pathologies in one lesion. Hybrid lesions comprising central giant cell granulomas (CGCG) with fibro-osseous components are rare, with only six maxillomandibular cases reported in the literature. We report a case of a hybrid lesion in a 38-year-old woman who presented with a swelling in the mandibular parasymphysis, on the left side. Panoramic and occlusal radiographs and CT showed a mixed lesion with expansion of the buccal cortical plate that pointed to the diagnosis of ossifying fibroma (OF). Complete excision of the lesion was performed, and the anatomopathological examination showed features of both CGCG and a fibro-osseous lesion. Clinical, imaging and histopathological features indicate a hybrid lesion of CGCG and OF. The patient remains asymptomatic after 30 months of follow-up.

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## Introduction

Lesions consisting of an association of characteristics from different pathologies have been reported in the literature. Hybrid lesions involving central giant cell granulomas (CGCG) and fibro-osseous components are very rare in the jaws, with only six cases reported in the literature.<sup>1–4</sup>

CGCG is defined by the World Health Organization (WHO) as an intraosseous lesion consisting of cellular fibrous tissue with multiple foci of haemorrhage, aggregation of multinucleated giant cells and, occasionally, immature bone trabeculae.<sup>5,6</sup> Radiographically, it presents as multilocular radiolucent areas, usually in the mandible. Females under 40 years old are more commonly affected.

Fibro-osseous lesions of the jaws are a heterogeneous group of lesions characterized by the replacement of normal bone by fibrovascular tissue containing newly formed mineralized material. They present cellular variability and the amount and content of the mineralized material are also variable.<sup>7</sup> Fibrous dysplasia, osseous dysplasia and ossifying fibroma are some pathologies included in this category.

We report a case of CGCG associated with a fibro-osseous lesion, and discuss the clinical, imaging and histological features of this hybrid lesion.

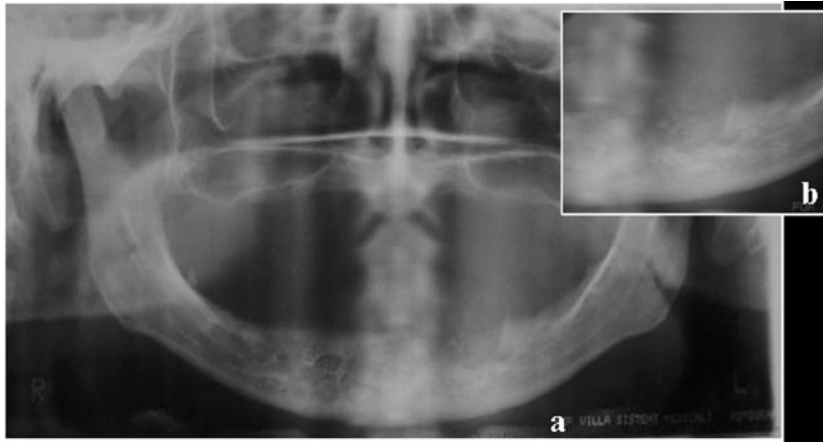
## Case report

A 38-year-old woman, edentulous, was referred to the UFBA (Federal University of Bahia) School of Dentistry with a firm swelling on the left side of the mandibular parasymphysis, measuring 3 cm in diameter. The lesion was hard on palpation and covered by normal mucosa. No previous trauma, pain or paraesthesia was reported and the patient was otherwise healthy.

A panoramic radiograph showed a well-defined radiolucent area with a bony sclerotic margin (Figure 1). Small radiopaque foci were observed within the lesion (Figure 1b). The occlusal radiograph also revealed buccal expansion with little impact on adjacent normal bone (Figure 2).

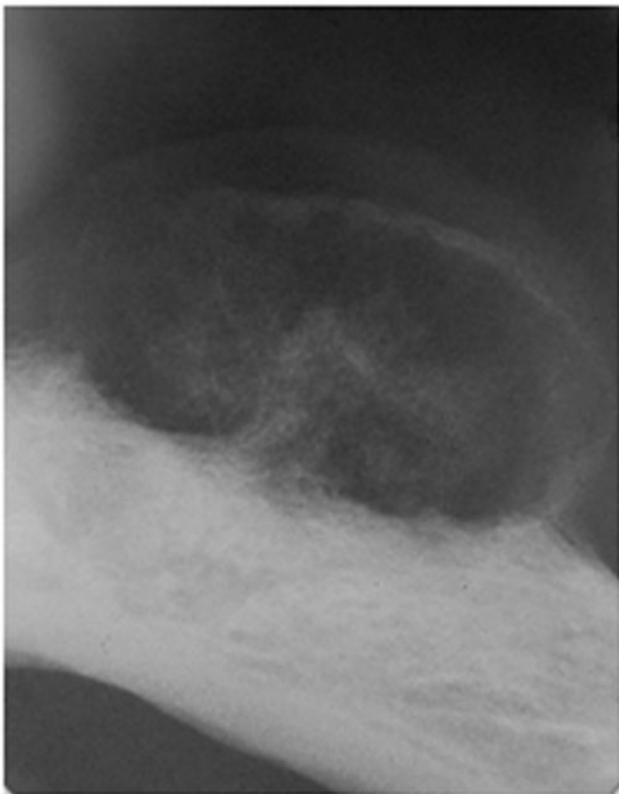
A non-contrast CT scan was carried out (Spiral, Hi Speed GE), with 1 mm slice thickness in increments of 1 mm. Sagittal, coronal and three-dimensional images were reconstructed from the axial slices, showing a well-

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**Figure 1** (a) Panoramic radiograph showing a radiolucent area in the left mandibular parasymphiseal region, with radiopaque foci within the lesion. (b) Close-up of the area showing the presence of sclerotic margins and radiopaque foci within the lesion

defined hypodense mass, with hyperdense areas within the lesion. The mass was located anteriorly from the mental foramen, and its dimensions were as follows: 22.6 mm anteroposteriorly, 17.9 mm mediolaterally and 12.3 mm craniocaudally. Bone erosion could be observed in the upper third of the mandibular body. The calcification pattern of the mass revealed a central hyperdense mass with peripheral extension and scattered mineralization (Figures 3 and 4). Soft tissue



**Figure 2** Close-up of the occlusal radiograph showing a mixed radiolucent/radiopaque pattern, expansion of the buccal cortex and little impact on the adjacent normal bone

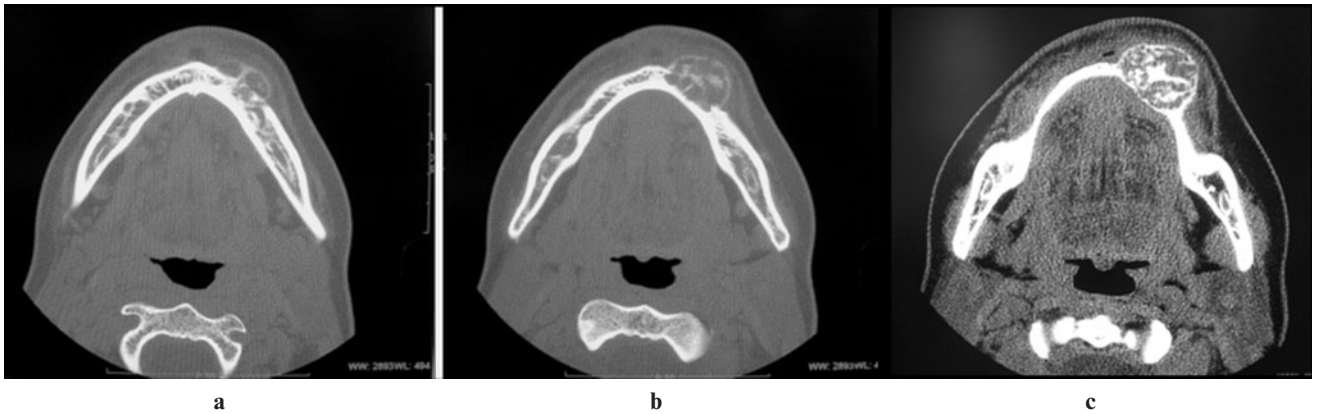
window and three-dimensional reconstructions (Figures 3c and 5, respectively) confirmed the mixed pattern of the lesion, as well as the integrity of the mental foramen (Figure 5a,b). Radiographic and CT features suggested a diagnosis of ossifying fibroma (OF).

The lesion was surgically excised and examined by an oral and maxillofacial pathologist. Macroscopically, the specimen consisted of several segments with a smooth surface and firm consistency. Segment dimensions ranged from 3.0 × 2.0 × 0.5 cm to 0.5 × 0.7 × 0.2 cm. Microscopically, sections showed decalcified tissue with interconnecting bony trabeculae displaying a curvy pattern. Some areas showed osteoblastic activity, and, less frequently, multinucleated giant cells could be seen. Fibrous and loose well-vascularized connective tissue was observed. Other areas presented haemorrhagic foci and accumulation of multinucleated giant cells of various shapes and sizes among the proliferation of fusiform and egg-shaped cells arranged in a lace-like pattern (Figure 6). The histological aspects pointed to a diagnosis of central giant cell granuloma associated with a benign fibro-osseous lesion.

After 30 months of follow-up, the patient remains asymptomatic. Panoramic radiography reveals a smaller slightly radiolucent area in the region previously occupied by the lesion, compatible with osteofibrous scar tissue.

## Discussion

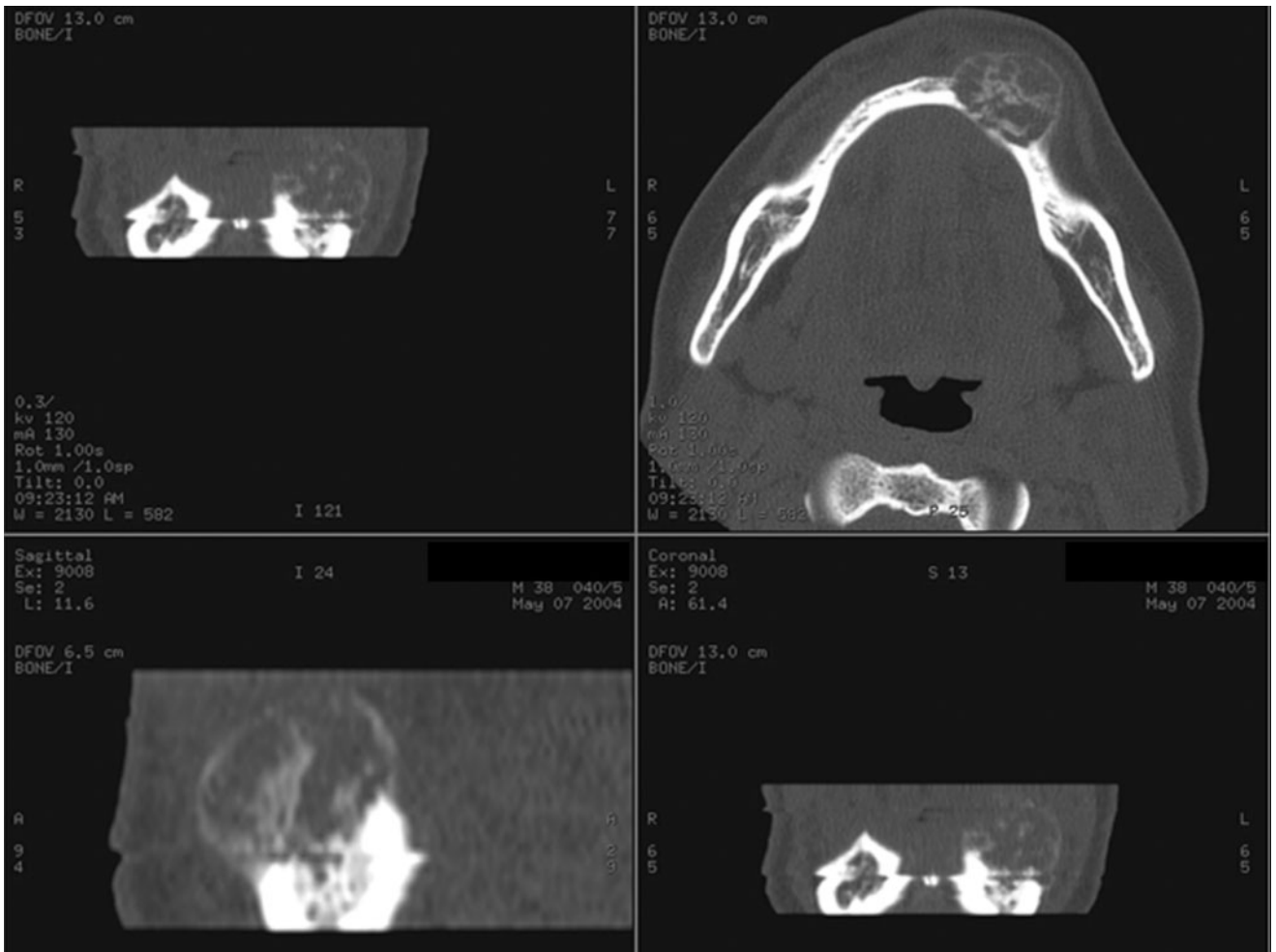
CGCG is a relatively uncommon lesion. The association of a CGCG with a fibro-osseous lesion affecting maxillomandibular bones is a very rare condition, with only a few cases described in the literature (Table 1).<sup>1-4</sup> De Mello *et al*<sup>8</sup> also presented a case involving the ethmoid bone of a 4-year-old boy. CGCG combined with other lesions, such as cherubism and Paget's disease, have also been reported.<sup>3</sup>



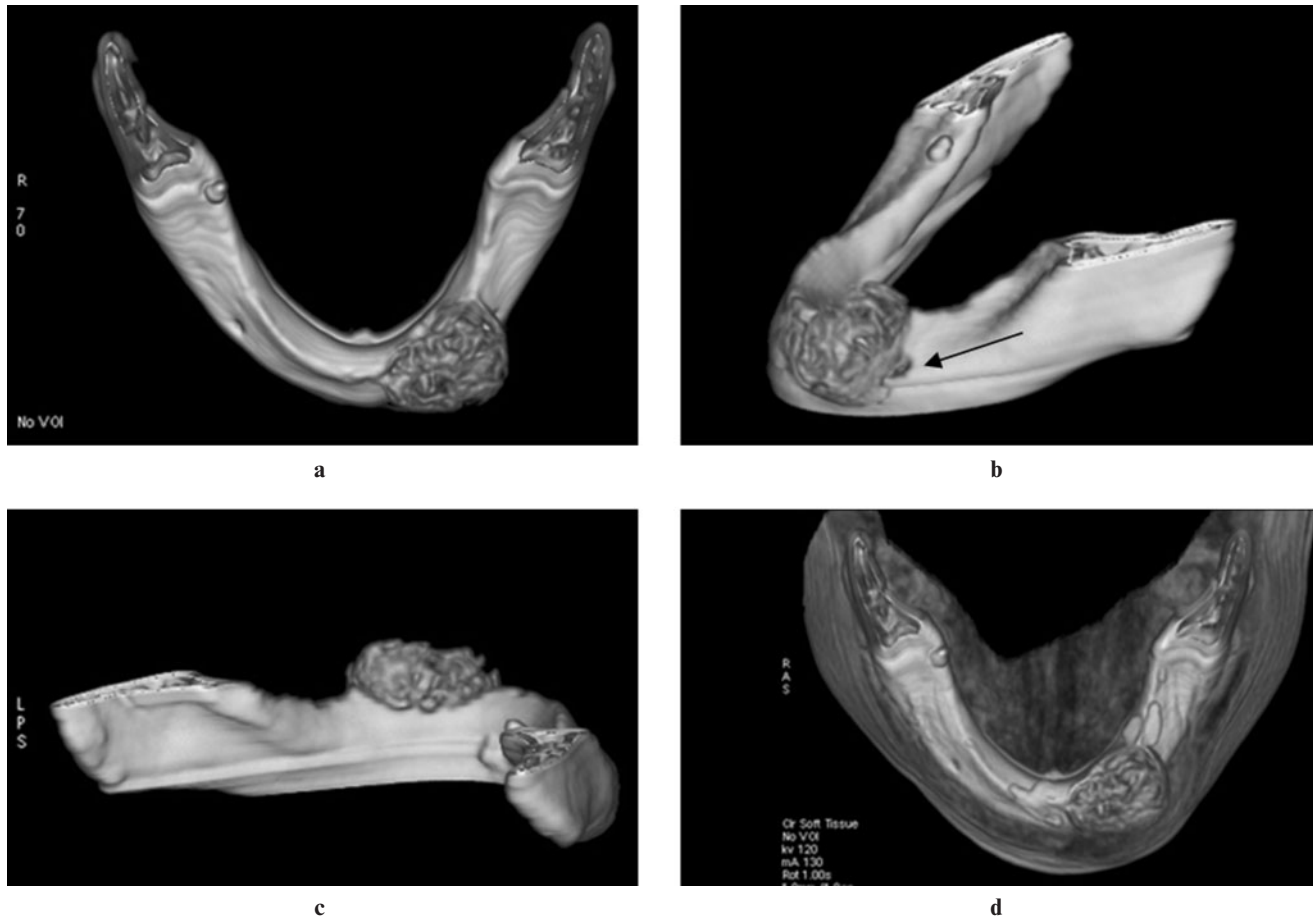
**Figure 3** (a,b) CT axial sections showing buccal expansion and the presence of disseminated calcified material (hyperdense mass) within the lesion. (c) CT soft tissue window showing the presence of calcified content within the lesion

The ages of individuals with reported hybrid CGCG and fibro-osseous lesions of the jaws range from 5–68 years, with an average of 31.9 years. The involvement of posterior regions, especially the mandible, seems to be a recurrent clinical feature in the few hybrid

lesions reported so far. There is a clear female predilection. The present case, as well as the case reported by Shetty *et al*,<sup>1</sup> involved an edentulous region. In the case presented by Farzaneh *et al*,<sup>2</sup> the right lower first molar was missing, and data on missing



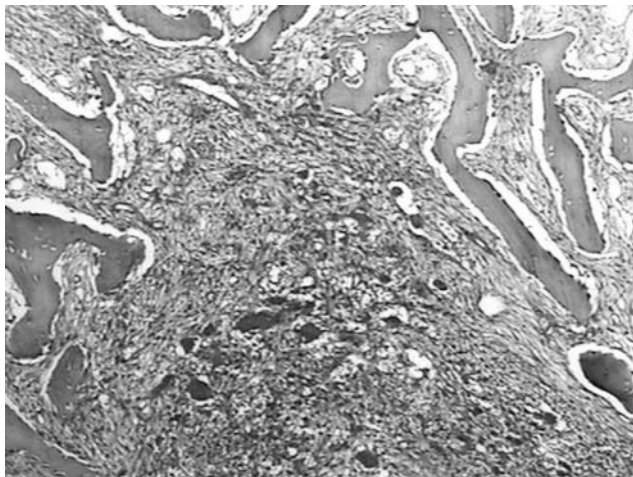
**Figure 4** CT multiplanar reconstruction showing the exophytic aspect of the lesion, occupying the upper third of the mandible, superiorly and anteriorly from the mandibular canal course



**Figure 5** (a–d) Three-dimensional CT volume rendering showing the extension of the tumour. (b) Note the proximity of the lesion to the mental foramen (arrow)

teeth were not available for the cases presented by Penfold *et al*<sup>3</sup> and Kaplan *et al*.<sup>4</sup>

Conventional radiography and CT features presented in this case, such as bony expansion and scattered



**Figure 6** Interconnecting bony trabeculae, with some areas displaying osteoblastic activity. In the central area, multinucleated giant cells are seen against a cell-rich stroma

mineralization (Figures 1–5), strongly point to a diagnosis of OF. Therefore, clinical and imaging findings combined with the histopathological features indicate a hybrid lesion of CGCG and OF. Penfold *et al*<sup>3</sup> reported a case of CGCG associated with OF presenting a “ground-glass” radiographic pattern, a typical finding in fibrous dysplasia. Three cases of OF combined with CGCG were reported by Kaplan *et al*,<sup>4</sup> two of which showed varying degrees of radiopacity within the lesion.

Farzaneh *et al*<sup>2</sup> and Penfold *et al*<sup>3</sup> argue that the occurrence of giant cells in association with fibro-osseous conditions may represent a reaction that stimulates modifications in the stroma of the original tumour. Theoretically, osteoblasts may activate osteoclast-type giant cells through paracrine mechanisms. The present case may also be related to such a phenomenon.

Histologically, OF may present giant cells, which represent osteoclasts associated with eventual mineralized material. In hybrid lesions, however, giant cells appear scattered in fibrovascular tissue.<sup>4</sup> These features could be observed in our case.

Differential diagnosis among fibro-osseous lesions can be very difficult, as these lesions do not present a well-defined behaviour. Good correlation between

**Table 1** Clinical, radiographic and histological features of hybrid lesions of central giant cell granulomas (CGCG) and fibro-osseous lesions described in the literature and in the present case report

Author (year of publication)	Male/female	Age	Maxilla/mandible	Left/right	Radiographic aspect	Follow-up	Histological diagnosis
Penfold <i>et al</i> (1993) <sup>3</sup>	M	41	Maxilla	Left	Radiopaque expansion	8 months without recurrence	CGCG, ossifying fibroma
Shetty <i>et al</i> (2004) <sup>1</sup>	F	39	Mandible	Left	Mixed, multilocular expansion	–	CGCG, cemento-osseous dysplasia
Farzaneh <i>et al</i> (2005) <sup>2</sup>	F	20	Mandible	Right	Radiopaque expansion	–	CGCG, fibrous dysplasia
Kaplan <i>et al</i> (2007) <sup>4</sup>	F	5	Mandible	–	Mixed, unilocular expansion	2 years without recurrence	CGCG, ossifying fibroma
Kaplan <i>et al</i> (2007) <sup>4</sup>	M	68	Maxilla	–	Unilocular expansion	4 years without recurrence	CGCG, ossifying fibroma
Kaplan <i>et al</i> (2007) <sup>4</sup>	F	12	Mandible	–	Radiolucent, unilocular expansion	Growth arrest maintained for 3 years	CGCG, ossifying fibroma
Crusoé-Rebello <i>et al</i> (current)	F	38	Mandible	Left	Mixed, expansion	2 years without recurrence	CGCG, ossifying fibroma

patient history, the clinical and imaging findings, histological features and other examinations is necessary. The fibro-osseous lesions may actually represent distinct phases of a single benign morphological process. OF and fibrous dysplasia are very similar microscopically, and thus radiographic evaluation is essential in the interpretation of fibro-osseous lesions.<sup>9</sup>

According to Eversole *et al*,<sup>10</sup> the histopathological features of the benign fibro-osseous process, and radiographic findings, such as evidence of bone cortical expansion and well-defined margins, suggest the diagnosis of non-aggressive OF, type B. However, the radiographic features seem to make a modest contribution to the diagnosis of hybrid lesions, as indicated by the small number of cases reported in the literature.<sup>11</sup> In addition, CGCG fundamentally presents radiolucent images, especially in lesions with dimensions comparable with the present case. It is recognized that CGCG may produce calcified material. However, in the case described here, the amount of calcified material was very high for the size of the lesion.

We emphasize that the CT images revealed the localization, nature and extent of the lesion. The last feature seems to be present in all the cases reported. The

images led to a diagnosis of OF, and the anatomopathological examination confirmed an association of CGCG and a fibro-osseous lesion.

Thus, based on the radiological and histological features, clinical behaviour and follow-up of this case, the CGCG component of this lesion is the non-aggressive type,<sup>12</sup> similar to the other cases reported previously (Table 1).

In conclusion, this form of hybrid lesion is rare, with only six other cases reported involving maxillomandibular bones. Therefore, the clinical, radiographic and histological features described here may contribute to the diagnosis of new cases. In this particular case, the CT images were very useful to understand the mixed nature of the lesion and its expansive behaviour. The uniqueness of each examination must be exhaustively investigated in order to reach a definitive diagnosis.

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