

CASE REPORT

Gorham's disease of the maxilla: a case report

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A case of Gorham's disease in the maxilla of a 56-year-old male patient is described. The clinical presentation, radiographic and histopathological features and treatment are presented. A discussion of the current understanding of this rare disease, based on review of the literature, is offered.

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Case report

History and clinical examination

In 2003, radiographs of a 56-year-old man, complaining of pain and loose teeth in his left maxilla, were submitted for radiological consultation. Based on the ill-defined bone destruction seen radiographically (Figure 1a–c), a provisional diagnosis of a malignant neoplasm was made. A biopsy was taken from the periapical region of the left maxillary first molar. This tooth was vital, but root canal treatment was performed at the time of the periapical biopsy because of the possibility of devitalization of the tooth. No evidence of neoplasia or cellular atypia was seen. A diagnosis of a cholesterol granuloma of the maxillary sinus was made.

2 years later (2005) the patient was referred to the radiology service complaining of progressive loosening of the teeth in his left maxilla. He described feeling a non-painful fullness over the left maxillary canine. Upon examination a firm, non-mobile, non-tender swelling in the left nasolabial fold region was palpated. The entire left maxillary posterior segment was mobile and could be displaced as a unit. The teeth in the region were not sensitive to percussion. There was no regional lymphadenopathy. The patient was otherwise in good general health and was a non-smoker.

Radiographic examination

Plain radiographs and CTs revealed generalized ill-defined destruction of the left maxilla (Figure 2a–e). The

osseous structures of the alveolar process on the left side were absent from the midline to the tuberosity, and the hard palate was resorbed nearly to the midline. The anterior wall of the maxillary sinus was missing and there was a small (1.7 cm) non-enhancing soft tissue mass in this region, corresponding to the swelling detected clinically. Soft tissue thickening was also noted along the buccal aspect of the roots of the maxillary teeth. The zygomatic process of the maxilla was partially destroyed, and the inferior extent of the posterolateral wall of the sinus was absent (Figure 2d). There was no adjacent soft tissue mass, either within the sinus or in the retroantral fat, to indicate an associated tumour as the cause of the bone destruction. There was no displacement or resorption of the teeth. No lymphadenopathy or masses elsewhere in the neck were identified.

A provisional diagnosis of Gorham's massive osteolysis was made owing to the lack of clinical or radiological findings to suggest a neoplastic, inflammatory, infectious or metabolic condition. An incisional biopsy was made at the leading edge of the bony destruction, apical to the maxillary left lateral incisor and canine, in the region of the soft tissue mass.

Histological examination

The histological sections examined showed fibrous connective tissue with a patchy chronic inflammatory infiltrate consisting of lymphocytes, plasma cells and histiocytes (Figure 3a–c). The fibroblasts were spindled to stellate in appearance, with rare mitoses. Dispersed throughout the tissue were small blood vessels and trabecular bone with osteolysis. Osteoclasts were seen in areas of bone resorption, but they were not

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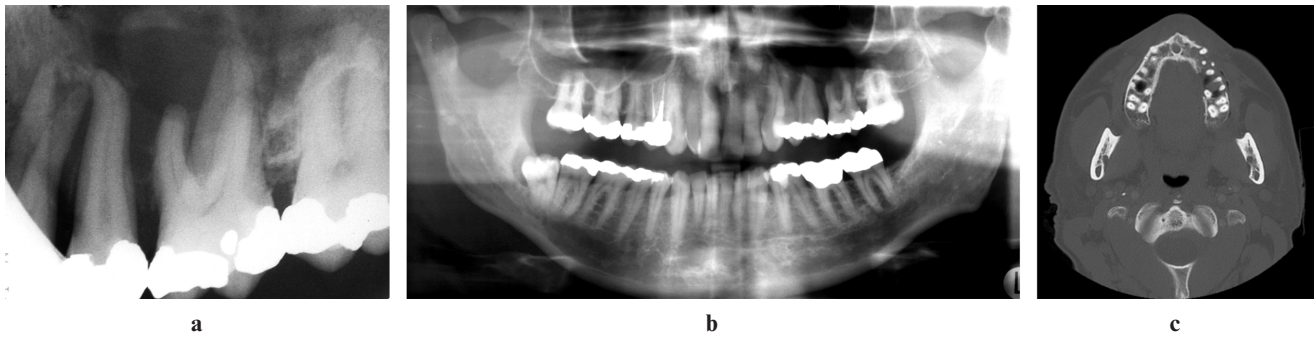


Figure 1 Digitally enhanced periapical (a), digitally enhanced panoramic (b), and axial bone window CT (c) images from initial presentation (2003) depicting a region of ill-defined bone loss in the left maxillary alveolar process around the premolars and first molar

prominent. Reactive new bone formation was also noted. No evidence of granulomatous inflammation or neoplasia was detected. Fungal stains were negative.

Treatment and follow-up

The patient was referred to a tertiary oncology hospital for radiation therapy. He was planned to receive 45 Gy in 25 fractions but received 43.21 Gy in 24 fractions. Follow-up CT studies were obtained at 1, 10, 18 and 21 months after completion of treatment. There was neither progression nor resolution of the disease for 1.5 years. At 21 months further bone destruction was detected across the midline of the palate (Figure 4a–c).

There remained no involvement of the mandible or skull base. The patient then completed 1 year of bisphosphonate therapy (pamidronate 90 mg intravenously every 3 months). A recent follow-up CT scan demonstrated progressive destruction of the maxilla as well as involvement of the floor of the orbit, suggesting that the therapy was not successful.

A resin-bonded splint was used to stabilize the affected dentition; however, the patient required extraction of multiple teeth in the left maxilla because of loss of bone support. An oral antral fistula developed, subsequent to the extractions and because of the absence of the underlying bone. The patient's current concerns are severe pain in the left maxilla and

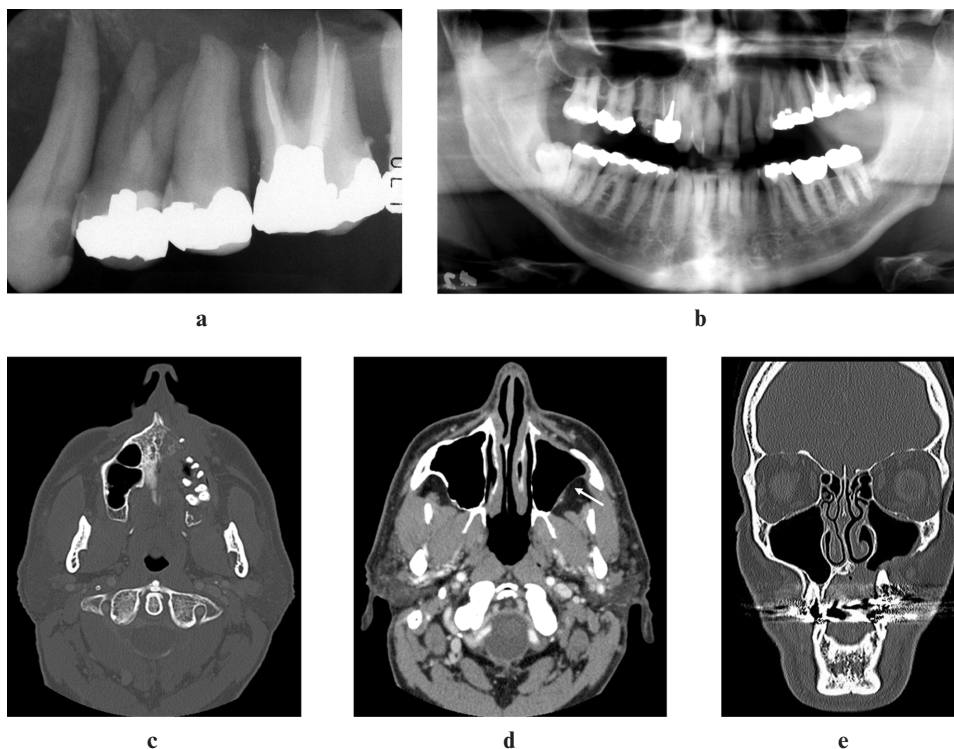


Figure 2 Digitally enhanced periapical (a), digitally enhanced panoramic (b), axial bone window computed tomography (CT) (c), axial soft tissue-window CT (d) and coronal bone-window CT (e) images at second presentation (2005) demonstrating massive bone destruction of the left maxilla. Despite loss of the cortical boundaries, there is no soft tissue mass present in the maxillary sinus or in the retroantral fat (d, white arrow)

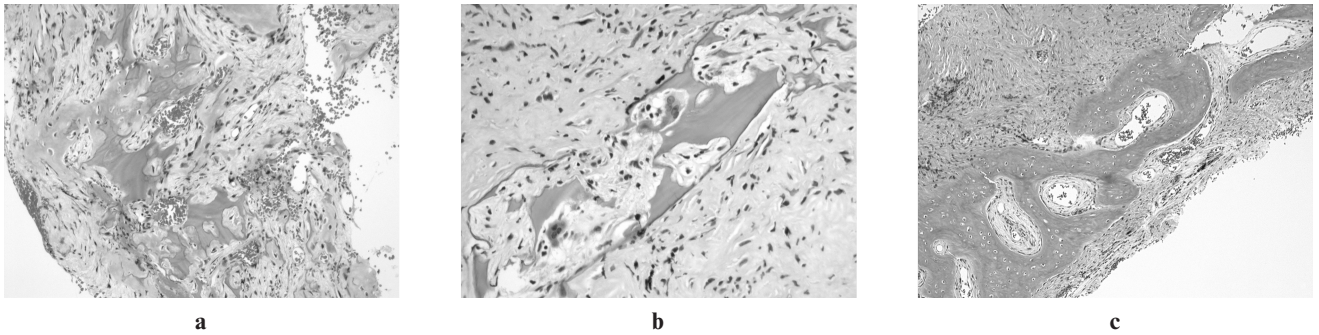


Figure 3 Histological sections, haematoxylin and eosin. (a) Fibrous connective tissue with trabecular bone and small blood vessels (low power); (b) trabecular bone with osteolysis (high power); (c) reactive new bone (medium power)

an enlarging oral antral communication, which he manages with irrigation.

Discussion

Gorham's disease, also termed massive osteolysis and vanishing bone disease, is a very rare and destructive condition, resulting in the spontaneous and progressive regional resorption of osseous structures with replacement by fibrous tissue. This entity is named after the author who described two cases of patients with massive osteolysis involving the clavicle and scapula in 1954.¹ Since then fewer than 150 cases have been reported in the literature² with approximately 40 cases involving the maxillofacial skeleton.³

Children and young adults are most commonly affected, although patients ranging in age from 18 months to 72 years have been reported.^{4,5} There is a slight male predilection.⁶ The most common sites of involvement are the shoulder and pelvis,⁷ although any bone may be affected. All previously reported cases involving the maxillofacial region have affected the mandible alone or with the maxilla, but never the maxilla alone,^{6,8,9} as in the case presented here. The clinical presentation is variable, and, in the jaws, pain,

tooth mobility, pathological fracture, facial deformity and malocclusion are early signs.^{3,6} Laboratory findings are unremarkable. Although the disease is progressive and can be severely disfiguring, it is rarely fatal. It may progress unremittingly over years but can also spontaneously arrest. The most common complications leading to death are chylothorax, when the ribs or thoracic vertebrae are involved, and transection of the spinal cord because of spine destruction.¹⁰

The cause of Gorham's disease is unknown. In 1955, Gorham and Stout¹¹ characterized the histopathological findings in this condition and attributed the bone destruction to local vascular angiomatosis. They postulated that the proliferation of vessels creates a hyperaemia that could disturb the osteoblast to osteoclast balance and result in increased bone resorption. More recently, Hirayama *et al*¹² reported that the number of circulating osteoclast precursors was no higher in a patient with massive osteolysis than in age- and sex-matched control subjects. Rather, the osteoclast precursors of the patient with osteolysis were found to be more sensitive to stimulating and humoral factors, such as receptor activator of nuclear factor kappa B ligand (RANKL) and interleukin-6, and produce greater lacunar resorption than the control cells. Devlin *et al*¹³ suggested that enhanced osteoclast activity, related to elevated serum

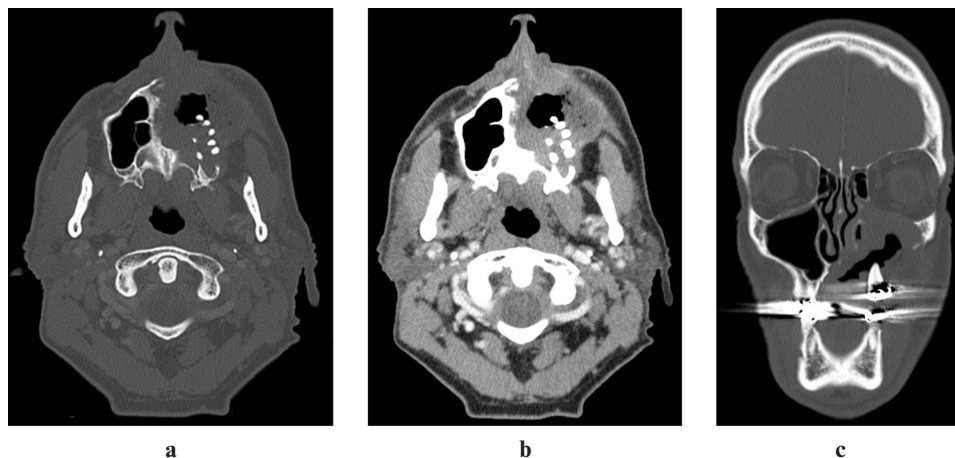


Figure 4 Axial bone window (a), axial soft tissue window (b) and coronal bone window (c) CT images from 21 months after radiation therapy (2008) demonstrate progressive bone destruction of the maxilla and soft tissue thickening

interleukin-6, contributes to the bone resorption of Gorham's disease. Trauma has also been implicated as an aetiological factor^{2,4,13} although it is not a consistent historical finding^{6,14,15} and may be incidental.¹

Radiological findings are dramatic. A large localized region of bone destruction with possible involvement of contiguous bones, even with extension across joint spaces, may be seen. Osseous structures are replaced with fibrous tissue. Associated soft tissue masses are rarely seen. MRI findings of Gorham's disease are non-specific and variable¹⁶ and advanced imaging studies may fail to reveal the presumed vascular nature of this condition.¹⁷ Given the rarity of this disease, other more common conditions must be considered in a differential diagnosis. Malignant disease must be ruled out histologically, although lack of a soft tissue mass points away from the presence of a neoplasm. Sclerosis and periosteal bone formation, seen radiographically in osteomyelitis, are not features of Gorham's disease. There are no serum abnormalities or generalized osseous changes as with metabolic conditions. Additionally, other rare conditions, such as granulomatous or osteolytic diseases, may present with concurrent effects on other organ systems or only in specific anatomical sites, which helps differentiate them from Gorham's disease.

Histological examination of tissue from an involved area reveals a non-specific vascular proliferation with fibrous connective tissue, sometimes containing lymphocytes and plasma cells. The vascular proliferation consists of thin-walled, often dilated, vascular or lymphatic channels of varying sizes. Angiomatosis, however, is not always a histopathological feature and has been questioned in the literature as an intrinsic characteristic.¹⁴ Some authors have reported cases of widespread, multicentric organ, osseous and/or skin involvement related to large lymphangiomas malformations,^{18–20} whereas other cases, such as the one

presented here, are more localized and lack significant vascular proliferation or soft tissue involvement. Vigorita *et al*¹⁸ proposed that the multicentric-type disease may develop secondary to a dysplastic lymphatic system and suggested that this should be considered a separate subtype of Gorham's disease. The presence of osteoclasts adjacent to bone fragments may or may not be a prominent feature.¹⁷ This may be related to the site of histological evaluation.¹³ New bone formation has been variably reported and may represent a periosteal reaction to the altered forces on the affected bone.¹⁴ Cellular atypia is absent. Definitive diagnosis of Gorham's disease is a diagnosis of exclusion.³

Treatment of Gorham's disease has met with variable success. Surgical resection of the affected area with osseous graft placement has often failed because of resorption of the graft. Radiation therapy has been advocated as a treatment of choice; however, in young patients the increased risk of developing a secondary malignancy must be considered. Other suggested treatments include bisphosphonates, calcitonin, vitamin D and alpha-2b-interferon therapy. The goal of treatment is to arrest progression of the osteolysis, as remineralization or reformation of affected bones is not seen. Currently, there is no universally accepted treatment for patients with Gorham's disease.

In conclusion, this report documents a case of Gorham's disease arising in the maxilla of a 56-year-old man. This appears to be the first published case of involvement of the maxilla without concurrent mandibular disease. Essentially, the imaging characteristics include bone resorption without an associated soft tissue mass or other evidence of a neoplasm or any sign of inflammatory disease. The aetiology and details of the disease mechanism remain controversial. Gorham's disease should be considered as a possible diagnosis when significant bone destruction occurs without an apparent cause.

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