

Case Report

Recurrent multifocal eosinophilic granuloma of the mandible and maxilla: a case report and literature review

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Abstract: Eosinophilic granuloma of the jaw is rare and preferably located within the posterior mandible. In this study, we report a case of multiple eosinophilic granuloma of the jaw in a 22-year-old man. This patient consulted to our hospital due to left-posterior maxilla pain that lasted for one year. X-ray and CT scan revealed an osteolytic area in the left-posterior maxilla. Then, the lesion was resected and pathologically diagnosed as an eosinophilic granuloma. Unfortunately, even though systemic radiotherapy and chemotherapy were performed, eosinophilic granuloma recurred; and new lesions developed four times at adjacent sites after one, two, five and eight years. Surgical resection, radiotherapy and chemotherapy were performed according to the patient's status. Based on follow-ups, difficulties on eating and pronunciation caused by teeth loss were major functional problems for this patient. Considering the rarity of recurrent multifocal eosinophilic granuloma of the jaw, literatures from other studies regarding this disease were reviewed.

Keywords: Eosinophilic granuloma, langerhans cell histiocytosis, mandible, maxilla, multifocal, recurrent

Introduction

In 1940, eosinophilic granuloma was first reported as an osteolysis disease of the bone by Jaffe and Lichtenstein, which accounted for less than 1% of all bone tumors [1]. This disease usually occurs in male children and adolescents, and prefers to locate at areas of the skull, mandible, ribs, femur and pelvis. Thus far, known risks of eosinophilic granuloma includes inflammation, allergy, trauma, immune, gene defect and family heredity [2, 3]. As previously reported, eosinophilic granuloma could be monostotic or polyostotic [4]. Monostotic lesions have favorable prognosis after appropriate treatment, while polyostotic lesions have higher recurrence risks [5]. This report presents a case of recurrent multiple eosinophilic granuloma of the jaw. In this study, we report a multifocal eosinophilic granuloma case involving the mandible and maxilla in a 22-year-old man, who experienced a four-time recurrence at adjacent sites.

Case report

In March 2008, a 22-year-old man presented to the Department of Oral and Maxillofacial Surgery in the Affiliated Stomatological Hospital of Nanjing University Medical School, complaining of pain in the left-posterior maxilla that lasted for one year. Physical examination indicated bulging alveolar bone and gingival ulcers in 26-28 regions (**Table 1**). X-ray and computed tomography (CT) scans identified an osteolytic lesion within the left-posterior maxilla (**Figure 1A**). Then, the lesion that involved 27 teeth was surgically resected under general anesthesia. Pathological findings included multinucleated histiocytes and numerous eosinophils (**Figure 2**), which was finally diagnosed as eosinophilic granuloma. Radiotherapy (total dose = 20 Gy) was applied and systemic chemotherapy with dexamethasone (0.75 mg, P.O., q.d.) was continued for one year.

Unfortunately, on March 23, 2009, recurrent lesions were observed at the left maxilla, and

Recurrent multifocal eosinophilic granuloma of the jaw

Table 1. Clinical and imaging manifestations of the four hospitalizations

Time	Chief complaint	Physical examination				Radio examination
		Location	Alveolar bone	Gingiva	Involved teeth	
2008-03-27	Painful teeth; Ulcer of the gingiva	Alveolar process from 26 to 28	Swelling in buccal maxillary	Swelling and pain	-	Cystic radiolucent area with uneven margin on Periapic from 26 to 28
2009-03-23	Swelling on jaw	Alveolar process from 26 to 28	-	-	Mobility I° on 26, 28	Cystic radiolucent area with uneven margin on Periapic from 26 to 28; 36-37, alveolar process bone defect on 45 and 46
		Alveolar process from 36 to 37	Swelling in buccal mandible	Ulcer and pain	Root exposure and mobility I° on 36, 37	
2010-02-25	Pain from jaw	Alveolar process from 45 to 46	-	Swelling	-	Cystic radiolucent area with uneven margin on Periapic from 26 to 28; alveolar process bone defect on 36, 37, 45 and 46
		Alveolar process from 26 to 28	-	-	Mobility II° and sensitivity to percussion on 26, 28	
		Alveolar process from 36 to 37	-	Ulcer with sequestrum exposed	Mobility I° and sensitivity to percussion on 36	
		Alveolar process from 45 to 46	-	-	Mobility I° and sensitivity to percussion on 45, 46, 47	
2013-06-28	Pain in gum	Alveolar process from 25 to maxillary tuberosity	-	-	-	Alveolar process bone defect with well-defined margin from 25 to maxillary tuberosity; irregular radiolucency with ill-defined margin from 35 to retromolar area; distal alveolar bone loss to periapic of 45
		Alveolar process from 35 to retromolar area	-	Swelling, ulcer and pain	-	
		Alveolar process from 45 to retromolar area	-	-	-	

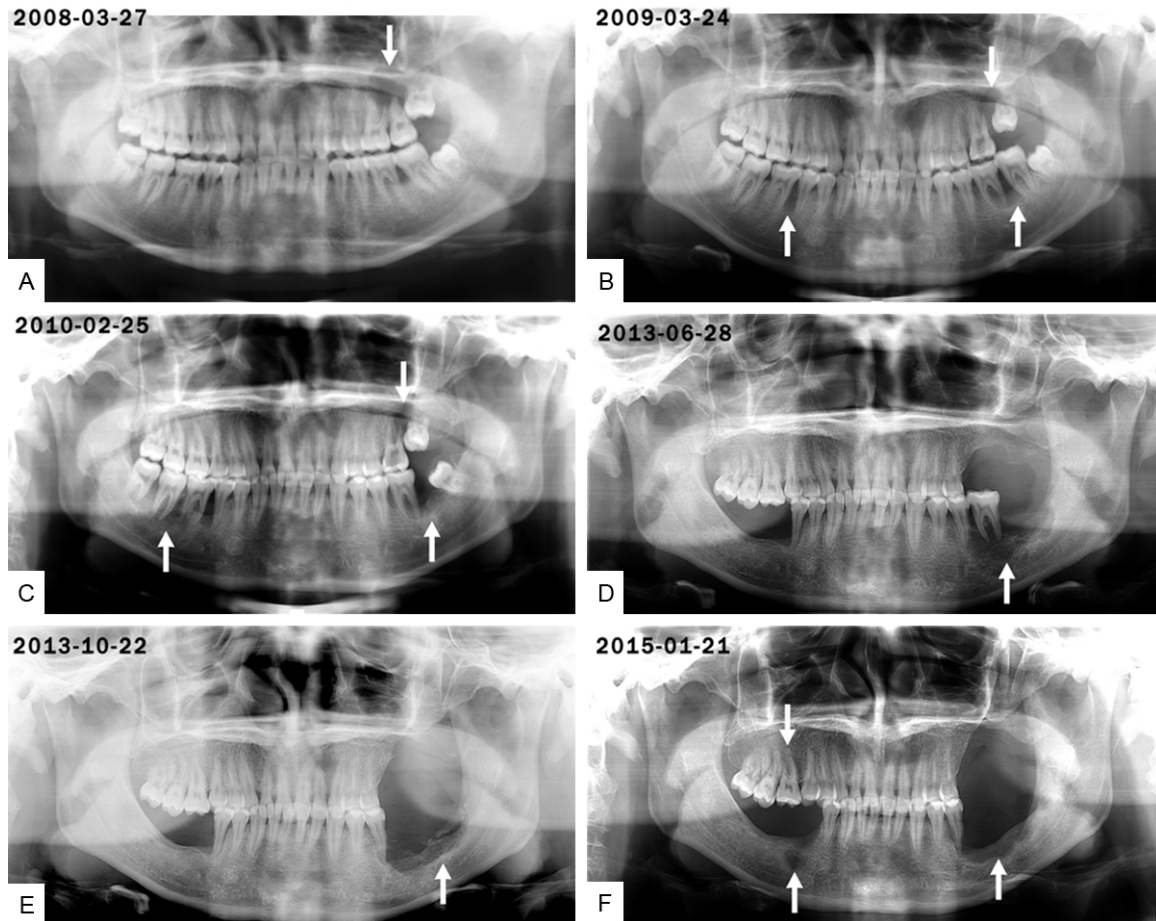


Figure 1. Eosinophilic granuloma of the mandible and maxilla was progressive for a period of seven years. White arrows denote active lesions and dissolved bone area with an obvious “scooped-out sharp”.

two new lesions were observed at the bilateral posterior mandible (**Table 1; Figure 1B**). Then, lesions were resected again and diagnosed as eosinophilic granuloma. After surgery, the same radiotherapy was administered and chemotherapy with dexamethasone was continued for another year.

In February 2010 (**Figure 1C**) and June 2013 (**Figure 1D**), recurrent lesions located at the maxilla and mandible were detected and surgically resected; and pathological diagnosis were all eosinophilic granuloma. After surgery, dexamethasone treatment was continued (0.75 mg, P.O., q.d.).

Overwhelmingly, at the latest follow-up in January 2015, two new lesions were detected in the right-posterior maxilla and right-posterior mandible (**Figure 1F**).

Immunohistochemical staining results are summarized in **Table 2**.

Through treatment, the main functional problem for this patient was eating and pronunciation difficulties caused by teeth loss.

Discussion

When eosinophilic granuloma occurred in the jaw, pain and swelling bones were the most common symptoms; which were accompanied with mobile teeth, toothaches, headaches and sensory disturbances [6, 7]. Physical examination often indicated swelling bone and mobile teeth within the affected area. However, clinical manifestations of eosinophilic granuloma are quite varied and atypical in some cases. In a case reported by Agarwal et al, the patient presented as unhealed dental socket [8]. While another sufferer showed asymptomatic swelling reported by Felstead et al [9]. The radiologic feature of eosinophilic granuloma of the jaw was a localized, punched-out radiolucent area without reactive sclerosis [10]. Bone destruc-

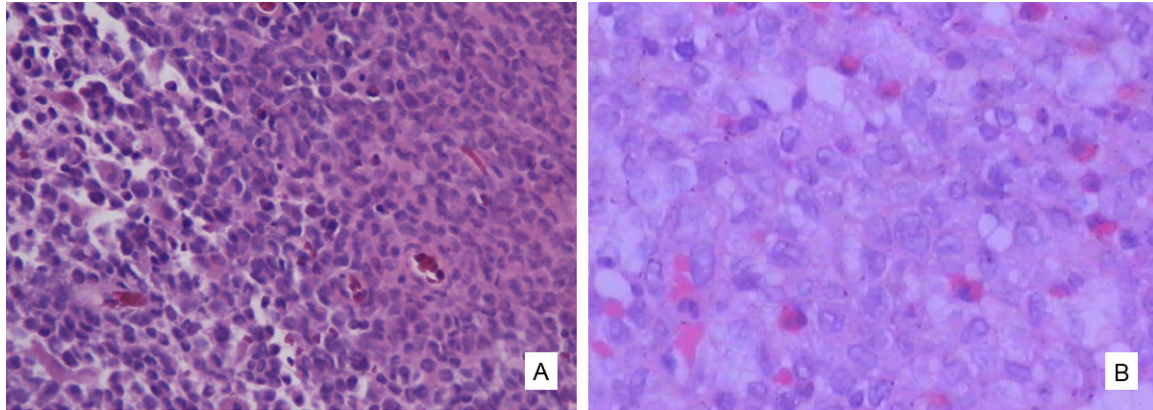


Figure 2. Photomicrograph of a pathological specimen. A. H&E staining (magnification = 20×). B. H&E staining (magnification = 40×).

Table 2. Immunohistochemical findings related to molecular markers of the four surgical samples

Time	CD1α	S-100	CD68	CD20	CD45Ro	Ki-67	LCA	MAC387	PCNA	Vim
2008-03-27	+	+	+	Scattered+	Scattered+	15%+	Scattered+	Scattered+	n	n
2009-03-23	+	+	+	n	n	n	n	-	+	n
2010-02-25	+	+	Scattered+	n	n	40%+	n	n	n	n
2013-06-28	+	+	+	n	n	40%+	Lymphocytes+	n	+	+

+: positive; -: negative; n: not examined.

tion was mostly jaw- or alveolar-bone-centered, which started below the crest of the alveolar process and resulted in the osteolytic area with a scooped-out sharp [11, 12]. Affected teeth usually presents a “floating” appearance due to severe alveolar bone resorption [13].

Histological features of eosinophilic granuloma included langerhans cells, a variable number of eosinophils (localized or aggregated around blood vessels), and a few other inflammatory cells [13]. Based on H&E staining results, langerhans cells were usually round-shaped with a typical central sulcus in the nucleus and a predominantly eosinophilic cytoplasm. Under an electron microscope, typical eosinophilic granules (Birbeck granules) could be seen in the cytoplasm of langerhans cells. Based on immunostaining analysis, langerhans cells could be positive of S-100 protein, CD1α, CD68 and CD14; but negative of CD83 or CD86 [14]. Consistently, this case was positive of S-100 protein, CD1α and CD68 (**Table 2**). Further, Bartnik *et al* suggested that Ki-67 expressions were related with the activity of langerhans cell histiocytosis, which may be a marker to guide clinical treatments of langerhans cell histiocytosis cells [15]. The overexpression of Ki-67

was also found in this case (**Table 2**), and may indicate a risk of recurrence and poor prognosis.

Main treatments for eosinophilic granuloma include surgical resection, radiotherapy and systemic/local chemotherapy. Surgical curettage is usually the first choice for treating maxillofacial monostotic and multiple lesions [6, 15]. In cases that involve multiple organs, surgical curettage supplemented with other feasible treatments could be helpful in improving treatment outcome [15]. Radiotherapy was required for inaccessible lesions such as weight-bearing bones and locations where surgery may lead to dysfunction, as well as recurrent lesions after surgical procedure; and the recommended dose was 5-6 Gy [16]. A review of the literature indicates that direct injection of corticosteroids into lesions or CT-guided radiofrequency ablation also showed positive therapeutic effects [17, 18]. Our patient was treated by local lesion curettage supplemented with low-dose radiotherapy and systemic corticosteroids. Follow-ups showed partial restoration in the margin of the bone defective area (**Figure 1E**), but osteolysis still continued; indicating that our treatment could slow down the development of the disease to some extent.

In conclusion, eosinophilic granuloma of the jaw is a rare benign tumor. In this study, we reported a case of recurrent multifocal eosinophilic granuloma of the mandible and maxilla. Local lesion curettage supplemented with low-dose radiotherapy and systemic chemotherapy could be adopted for patients with this disease. Special attention should be given on the characteristics of the maxillofacial region and in preserving appearance and functions, to improve therapeutic efficacy and quality of life of the patient. Continual follow-up is necessary to monitor the progress of eosinophilic granuloma.

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Disclosure of conflict of interest

None.

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