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Giant cell reparative granuloma of the nasal cavity: a rare site of presentation with review of literature

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ABSTRACT

Giant cell reparative granuloma (GCRG) was first described in the 1950s. It is an uncommon and benign reactive tumor that is believed to occur after trauma or inflammation. It most commonly occurs in the maxilla and mandible and rarely affects the nasal cavity. It is often seen in children and during the second to third decades of life, predominantly seen among females. Histopathologically, GCRG shows many osteoclast-like multinucleated giant cells scattered in a background of mononuclear stromal cells and spindle-shaped fibroblasts also associated with areas of hemorrhage. The distinction between GCRG and giant cell tumors (GCT)is crucial since both have a similar clinical and histological presentation, but both have different management. GCTs have malignant potential, may metastasize, and have a high rate of recurrence. Surgical excision is the mainstay therapy of GCRG to ensure a low rate of recurrence. Here we discuss two cases GCRG, both presenting as nasal mass.

Keywords
Nasal Cavity, Histiocytes, Granuloma

INTRODUCTION

Giant cell reparative granuloma (GCRG) is a rare non-neoplastic reactive tumor observed, more commonly, after trauma and inflammation.[1,2] In 1953, Jaffe first described it.[1] GCRG occurs mostly in children and young adults with a higher prevalence in young females. The most common site of presentation is the mandible and the maxilla followed by bones of the hands and feet.[3,4] GCRG rarely occurs in the nasal cavity, paranasal sinuses, or the orbit. Only a few cases of GCRG of nose have been reported in the literature.[3-10.] Despite being a benign entity, GCRG presents a local aggressive behavior with the invasion of the cranium.[3,4] Herein, we report two cases of GCRG of the nose in two females over 9 years [2011 to 2019] in our institute.

Case 1

A 17-year young female presented with the chief complaint of nose bleeding for one month and nasal block for 15 days, which was associated with on-and-off headache and fever. On examination, the right side of the face was swollen. On physical

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examination of the nose, there was a pale obstructive mass abutting the nasal septum seen in the right nasal nares, but there was no active bleeding from the nose. Oral cavity and ear examination were unremarkable. Laboratory findings are all within normal limits.

The contrast-enhanced magnetic resonance study revealed a fairly well-defined heterogeneously enhancing lobulated polypoidal lesion arising from the nasal septum, measuring 4.5 × 3 × 1.8 cm, causing occlusion of the right nasal cavity with the erosion of nasal septum and ethmoidal air cells (Figure 1A and 1B).

The angiography of the intracranial internal carotid artery was unremarkable. The mass was entirely excised, clearing the nasal airway. Grossly, the mass was grey-brown to grey-white fragmented soft tissue bits measuring 4 × 3 cm. The histologic examination showed randomly dispersed osteoclast-like giant cells in a spindle-cell stroma along with areas of osteoid formation. Some of the areas showed cystic cavities lined by fibro collagenous tissue and osteoclastic giant cells filled with blood (Figure 2A, 2B, 2C, and 2D). Based on these findings, the histological diagnosis of GCRG with aneurismal bone cyst formation was made. The postoperative period was uneventful.

Case 2

A 33-year female presented with the chief complaint of frontal headache and nasal obstruction for one year. There was no previous history of nasal trauma or injury. On the nose examination, a septal cartilage perforation presented an ulceroproliferative growth on the left. All lab workup was within normal limits. The computerized tomography scan showed an expansile polypoidal mass measuring 3.5 × 3 × 1 cm within the left nasal cavity. Nasal bone septum perforations were depicted, but no intracranial extension of the lesion was present. Initially, a small biopsy examination showed scant fibro collagenous tissue with foamy histiocytes and fibroblasts considered as chronic granulation tissue, much probably, due to the biopsy narrowness. The mass was then wholly excised along with the repair of the septal perforation. Histopathology showed ulcerated mucosal tissue bits covered by granulation tissue and multiple areas of fibro collagenous tissue showing plump spindle cells, fibroblasts, and multiple foamy histiocytes. Occasional giant cells and a collection of mixed inflammatory cells were seen. (Figure 3A, 3B, 3C and 3D) All the special stains like Ziehl-Neelsen stain for acid-fast bacilli and Periodic Acid-Schiff stain for fungus were negative. Features were suggestive of GCRG. The postoperative period was uneventful, and the patient was discharged on the 7th post-operative day.

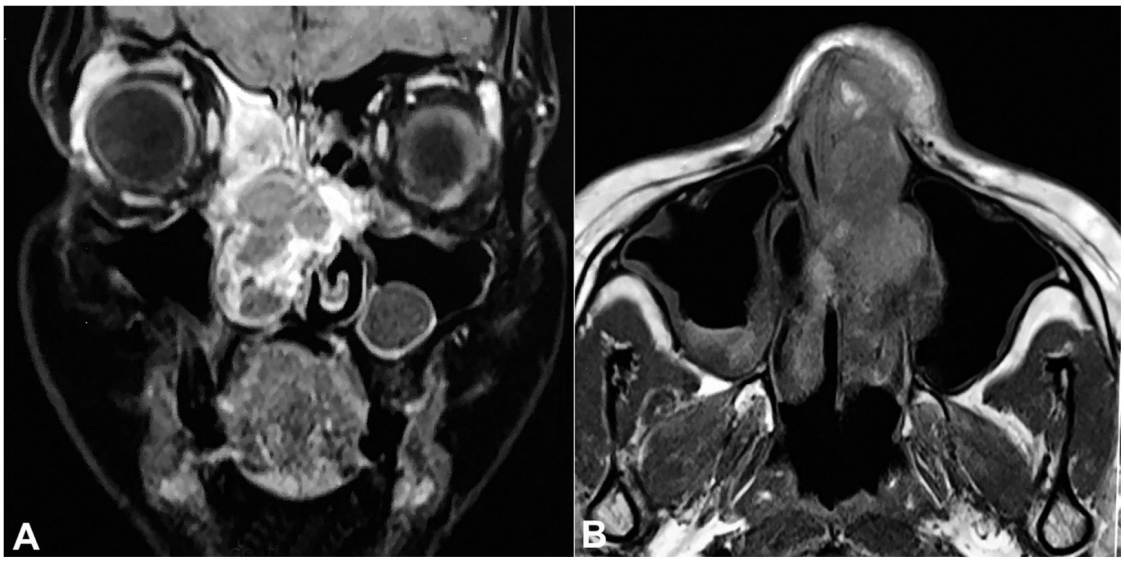

Figure 1. Fascial MRI – **A –** coronal view of T1 weighted image showing lobulated polypoidal lesion arising from the nasal septum measuring 4.5 X 3 cm causing occlusion of the right nasal cavity with erosion of nasal septum and ethmoidal air cells; **B –** Axial view of T1 weighted image showing polypoidal lesion in the right nasal septum.

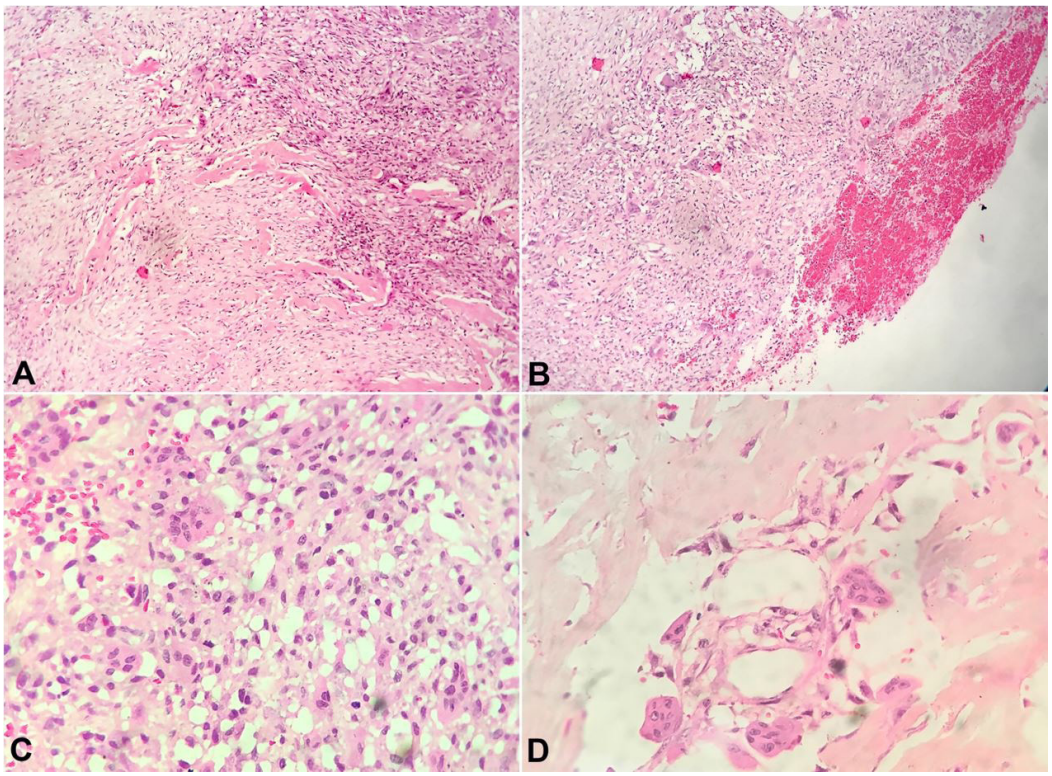

Figure 2. Photomicrographs of the tumor (case 1). **A** and **B** show the osteoclast-like giant cells in the spindled stroma with osteoid formation along with cystic cavity lined by fibro collagenous tissue and osteoclastic giant cells filled with blood (H&E, 200X); **C** and **D** show osteoclast-like giant cells in the spindle cell stroma with osteoid formation (H&E, 400X).

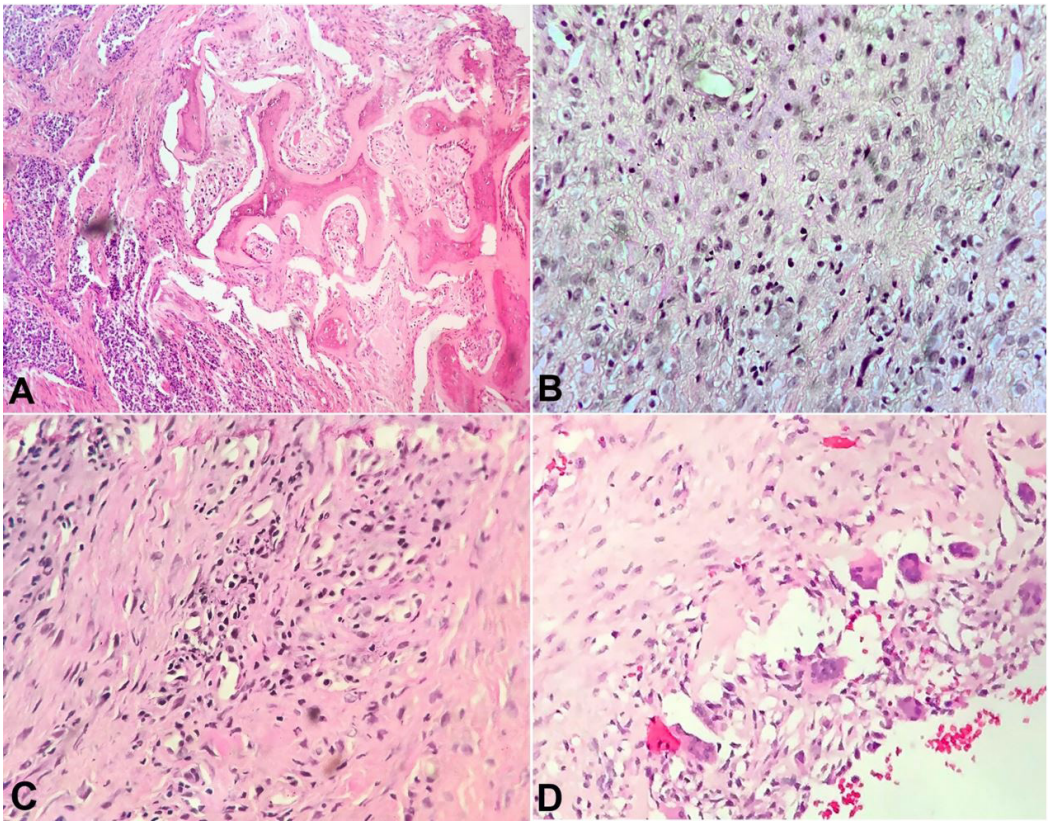

Figure 3. Photomicrographs of the tumor (case 2). **A** and **B** show fibro collagenous tissue with plump spindle cells, fibroblasts, and multiple foamy histiocytes. Occasional foreign body giant cell and collection of mixed inflammatory cells, mostly of neutrophils, lymphocytes, and few plasma cells are seen. (H&E, 200X); **C** and **D** show fibro collagenous tissue with plump spindle cells and foamy histiocytes along with giant cells (H&E, 400X).

DISCUSSION

Despite a rare location, both of the young females, presented herein, had the diagnosis of GCRG in the nasal cavity.[2,5] This rare tumor most commonly occurs in the mandible and the maxilla. GCRG also tended to occur more commonly in children or the second and third decades of the life of young adults with more preponderance among females.[2,5] In our study, we had two cases in 9 years, and both of them were young females, and both involved the nasal cavity. After searching on the Google Scholar and PubMed using the keywords "Giant cell reparative granuloma" and "Nose", we retrieved eight cases of nasal CGRG reported in the English literature (Table 1).

GCRG is classified into central if the underlying bone is involved and peripheral if only the soft tissue is involved.[3] Our two cases were central since the bony septum was involved.

GCRG is a rare benign lesion, which is considered to be a reactive response to an intraosseous hemorrhage secondary to either trauma or chronic inflammation.[1,2,5] In both of our cases, there was no history of trauma; therefore, the triggering event could not be ascertained.

The closest differential diagnosis of GCRG is the giant cell tumor (GCT), both present similar clinical and histological features.[6] Clinically, GCT is common in the third and fourth decades of life, while GCRG is mainly seen in younger female but have been reported in all age groups.[5] Unlike GCT, GCRG has a benign course.[6]

Histologically, both tumors are very similar.[6,9] In GCT, the osteoclastic giant cells are uniformly distributed, while in GCRG, the giant cells are more concentrated around the hemorrhagic foci.[6] GCT have high mitotic activity, which characterizes its malignant potential. GCRG tends to form cysts with evidence of recent and old hemorrhage with new osteoid formation, whereas GCT has a scant fresh hemorrhage, no osteoid formation, but much vascular proliferation.[2,6] GCT of the bone has a bad prognosis and requires surgical resection and radiotherapy.[2,8]

Another differential diagnosis is an aneurysmal bone cyst and brown tumor of hypoparathyroidism.[6] Brown tumors can be differentiated with the clinical history and laboratory findings of hypoparathyroidism, whereas GCRG is associated with normal blood and urinary calcium, phosphate level, and normal PTH level.[5] The aneurysmal bone cyst has a honeycomb appearance on histology, i.e., it shows many cystic lesions filled with blood that is lined by fibro collagenous tissue and giant cells.[6] Our first case presented areas of aneurysmal bone cyst formation along with GCRG lesion.

Non-surgical treatments of GCRG include (i) the use of corticosteroid injections; (ii) calcitonin; (iii) interferon-alpha; (iv) radiation therapy; (v) intravenous bisphosphonates; (vi) thermal sterilization using laser or cryoprobe; and (vii) partial resection.[6,7] However, en-bloc resection and excision with and without curettage is the mainstay treatment of choice of GCRG to reduce the risk of recurrence.[6-9]

Table 1. Cases of GCRG reported in nasal cavity in English literature.

Author	Age (Y)	Sex	Presentation	Tumor Size (cm)	Location	Bone erosion	Histological diagnosis
Abdel-Rahim[6]	70	M	Nasal obstruction	1.5	LNC	Absent	GCRG
Seo[7]	10	F	epistaxis, nasal obstruction, proptosis, epiphora	NA	RNC	Present	GCRG
Morris et al.[5]	7	F	Diplopia, violent behavior, apnea, epiphora	NA	RNC	Absent	GRCG
Ishinaga et al.[3]	49	F	Nasal obstruction, diplopia, epistaxis, proptosis	NA	RNC	Present	GCRG
Zhang et al.[8]	35	M	Nasal obstruction	9.8	RNC	Present	GCRG
Lingaiah et al.[4]	24	M	Nasal obstruction, epistaxis, epiphora, proptosis	5	LNC	Present	GCRG
Larson et al.[9]	77	F	Epistaxis	0.8	RNC	Absent	GCRG
Mohammadi and Hassannia[10]	38	M	nasal obstruction, bloody discharge, epiphora.	NA	LNC	Present	GCRG
Current case1	17	F	Nasal obstruction, epistaxis	4.5 x 3	RNC	Present	GCRG
Current case2	33	F	Headache, nasal obstruction	3.5 x 3	LNC	Present	GCRG

cm = centimeter; F = female; GCRG = Giant cell reparative granuloma; LNC = Left nasal cavity; M = male; NA = non-available; RNC = Right nasal cavity; Y = years.

In the present cases, en-bloc resection was done with an uneventful post-operative period.

CONCLUSION

GCRG is a sporadic tumor, especially at the nasal cavity location. One should consider this entity in the differential diagnosis of giant cell tumors of the nasal cavity as both have different prognosis and management prospects. Different case reports on GCRG at the nasal cavity showed an aggressive behavior; however, most of them were cured by surgical resection.

REFERENCES

1. Jaffe HL. Giant-cell reparative granuloma, traumatic bone cyst, and fibrous (fibroosseous) dysplasia of the jawbones. Oral Surg Oral Med Oral Pathol. 1953;6(1):159-75. http://dx.doi.org/10.1016/0030-4220(53)90151-0. PMid:13026160.
2. Oda Y, Tsuneyoshi M, Shinohara N. "Solid" variant of aneurysmal bone cyst (extragnathic giant cell reparative granuloma) in the axial skeleton and long bones: a study of its morphologic spectrum and distinction from allied giant cell lesions. Cancer. 1992;70(11):2642-9. http://dx.doi.org/10.1002/1097-0142(19921201)70:11<2642::AID-CNCR2820701113>3.0.CO;2-#. PMid:1423194.
3. Ishinaga H, Otsu K, Mouri G, Takeuchi K. Aggressive giant cell reparative granuloma of the nasal cavity. Case Rep Otolaryngol. 2013;2013:690194. http://dx.doi.org/10.1155/2013/690194. PMid:23585980.
4. Lingaiah J, Ganji L, Yella S, Thatikonda K. A rare case of reparative granuloma of nasal cavity. Int J Otolaryngol Head Neck Surg. 2014;3(5):293-7. http://dx.doi.org/10.4236/ijohns.2014.35052.
5. Morris JM, Lane JI, Witte RJ, Thompson DM. Giant cell reparative granuloma of the nasal cavity. AJNR Am J Neuroradiol. 2004;25(7):1263-5. PMid:15313721.
6. Abdel-Rahim M. Giant cell reparative granuloma of the nasal cavity in an elderly man: a case report and literature review. Otolaryngology Case Reports. 2018;9:23-5. http://dx.doi.org/10.1016/j.xocr.2018.10.002.
7. Seo ST, Kwon KR, Rha K-S, Kim S-H, Kim YM. Pediatric aggressive giant cell granuloma of nasal cavity. Int J Surg Case Rep. 2015;16:67-70. http://dx.doi.org/10.1016/j.ijscr.2015.09.011. PMid:26433924.
8. Zhang Q, He Z, Wang G, Jiang H. Radiotherapy for recurrent central Giant cell granuloma: a case report. Radiat Oncol. 2019;14(1):130. http://dx.doi.org/10.1186/s13014-019-1336-7. PMid:31324249.
9. Larson AK, Amjad EH, Raulicino M. A rare giant cell lesion originating from the nasal septum. Ann Clin Case Stud. 2018;1(1):1002.
10. Mohammadi S, Hassannia F. Giant cell reparative granuloma of nasal cavity, a case report. J Craniomaxillofac Surg. 2010;38(2):145-7. http://dx.doi.org/10.1016/j.jcms.2009.03.012. PMid:19501517.

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