ISSN: 2687-8410
Archives of
Clinical Case Studies
DOI: 10.33552/ACCS.2026.05.000615
Iris Publishers

Case Report

Maxillary Sinus Cavernous Hemangioma: A Case Report

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Received Date: September 10, 2026

Published Date: September 15, 2026

Abstract

Hemangioma of the paranasal sinuses is an infrequent condition. Classically, three types of hemangiomas are recognized: capillary, cavernous, and mixed. Cavernous hemangioma is rare in the sinonasal tract and is located primarily in the maxillary sinus and the lateral wall of the nasal cavity (middle and inferior turbinates). Patients typically present with recurrent epistaxis and nasal obstruction. Computed tomography (CT) scans and MRI should be performed to characterize the mass and evaluate its extension. We report a case of a maxillary sinus cavernous hemangioma in a 43-year-old female presenting with recurrent epistaxis, nasal obstruction, and cheek swelling. A lateral nasal approach allowed for complete resection of the tumor, with an uneventful postoperative course and follow-up.

Keywords: Epistaxis; cheek swelling; CT scan; cavernous hemngioma

Introduction

Nasal granuloma is a benign fibrovascular proliferation lesion with According to International Society for the Study of Vascular Anomalies classification 2025, "hemangioma" should be classified as either vascular tumor or vascular malformation [1]. Batsakis historically distinguished three variants of hemangioma: capillary, cavernous, and mixed [2]. Hemangiomas are rare entities within the sinonasal tract, where the capillary variant (lobular capillary hemangioma) predominates, especially in the nasal septum (Kiesselbach's area). In contrast, cavernous hemangiomas typically arise in the lateral wall structures, including the inferior and middle turbinates, and only rarely involve the maxillary sinus. Recurrent epistaxis and nasal obstruction are the principal signs. As the tumor grows, other symptoms may arise, such as pain, swelling, proptosis, and neurological disturbances. Imaging studies, specifically CT and MRI, are essential to obtain information about the tumor and its surrounding structures. The mainstay of treatment for cavernous hemangioma is complete surgical excision actually by endonasal endoscopic approach.

Clinical Case

A 43-year-old female presented to our department with recurrent epistaxis and right nasal obstruction lasting for 10 months. The patient reported right facial pain, swelling, and a three-month history of right proptosis. She had no relevant medical or surgical history. Family history included diabetes mellitus, hypertension, and a cerebrovascular accident in her father. Clinical examination revealed tenderness upon palpation of the right infraorbital region, accompanied by a firm swelling. Proptosis of the right globe was noted, with normal ocular motility. Endonasal endoscopy showed congestive nasal mucosa and medialization of the right lateral nasal wall, but without any visible mass or tumor. The nasopharynx was normal. Neck examination revealed no cervical adenopathy. An intrasinus maxillary lesion was suspected, and imaging studies were performed. A CT scan revealed a large, homogeneous maxillary sinus mass expanding into adjacent structures, accompanied by calcifications and bony erosion/remodeling (Figures 1&2).

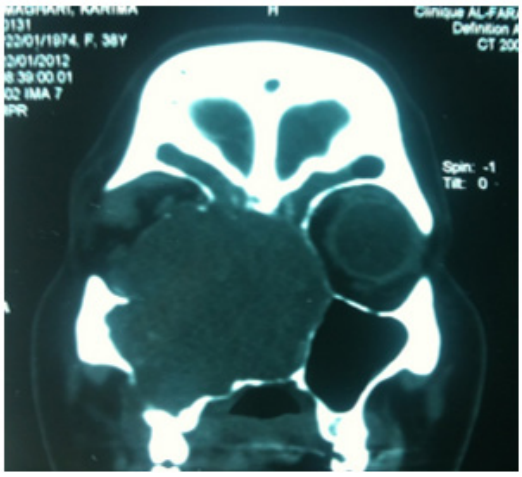

Figure 1: Coronal-CTscan: A well definite lesion occupying maxillary sinus with bony remodeling.

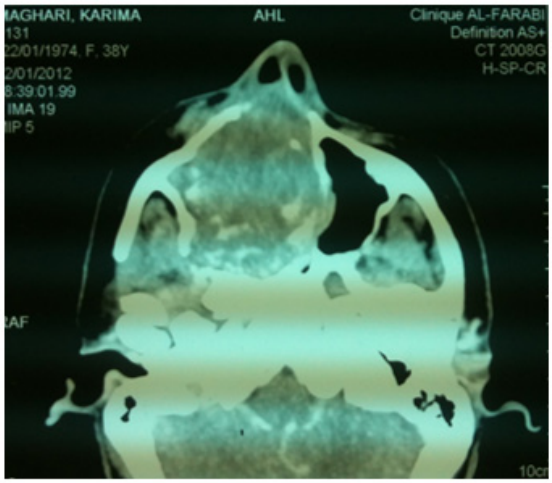

Figure 2: Axial CT-scan: voluminous maxillary lesion with intra tumoral Calcification.

The skull base and intracranial structures were spared. On the coronal view, two hypodense lesions suggesting foci of necrosis were noted (Figure 3).

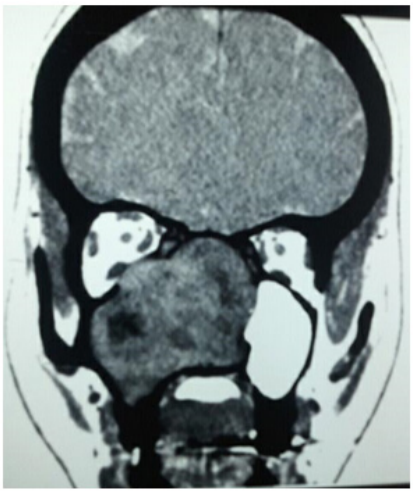

Figure 3: Coronal view: circonscrived maxillary mass with heterogenous aspect (necrosis focci).

The CT angiography (CTA) suggested a vascular lesion, demonstrating calcifications (phleboliths) and blood supply from the facial artery (Figures 4&5).

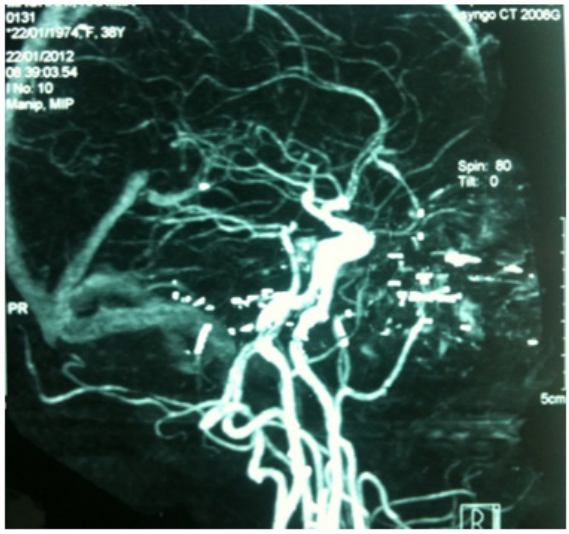

Figure 4: CT angiography shows a well-circumscribed mass (tumor overhang) with phleboliths. The vascular supply appears to originate from the facial artery.

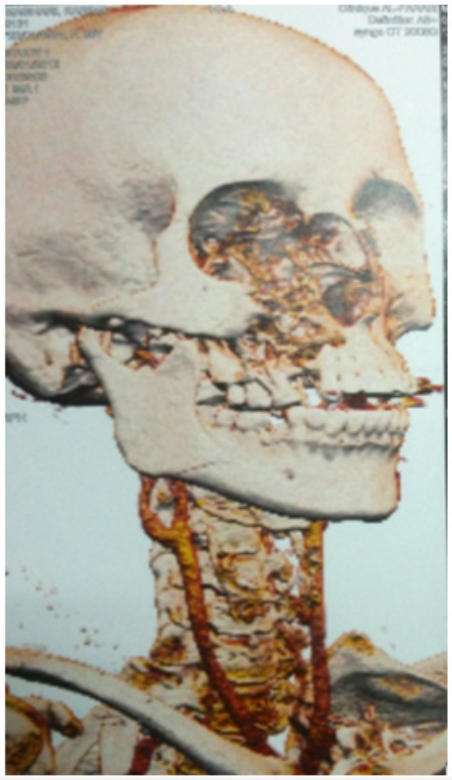

Figure 5: CT angiography (CTA): Vascular confluence in the right suborbital region, supplied by the facial artery.

A right lateral nasal approach combined with an infraorbital incision revealed destruction of the anterior wall of the right maxillary sinus. A well-circumscribed, red, mammillated mass occupied the cavity. Progressive dissection allowed for complete resection with controlled, minimal bleeding (managed via compression and bipolar coagulation). The orbital floor was deformed but showed no lysis. Nasal packing was maintained for three days. The postoperative course was uneventful. The postoperative treatment included intravenous amoxicillin-clavulanic acid (2 g, three times a day), intravenous dexamethasone (80 mg once a day) for four days, and intravenous paracetamol (1 g, three times a day) for two days. Histopathological examination concluded a cavernous hemangioma of the maxillary sinus (Figure 6).

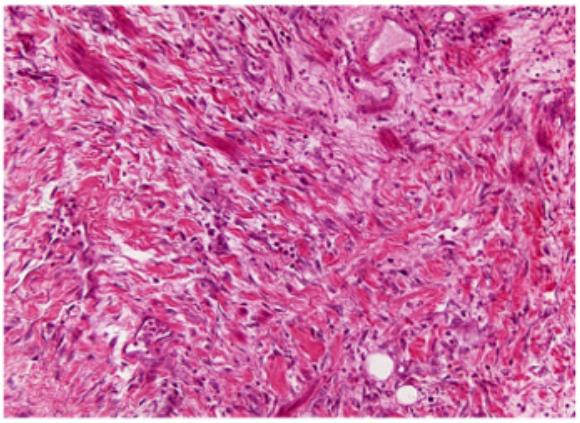

Figure 6: Histologic view: cavernous hemangioma (X10 magnification).

The patient was discharged after five days.

Discussion

The sinonasal cavity is an uncommon site of hemangiomas of the head and neck. Most nasal hemangiomas arise from the nasal septum or vestibule and are of capillary type (lobular capillary hemangioma). Sinonasal cavernous hemangioma is rare and poorly described in the literature. By late 2022, 20 cases of sinonasal cavernous hemangioma had been reported in the literature [3]. Our study expands this number to 23 cases.

The most common age of presentation is in the third or fourth decade of life [4]. Hemangiomas have a stronger predilection for female subjects, with a 5–6:1 female-to-male ratio [5]. Hemangiomas can arise from osseous, mucosal or submucosal tissues of the nasal cavity or sinuses [6]. The hemangioma initially developed in the sinonasal mucosa and extended into the nasal cavity. Cavernous hemangiomas can develop in the nasal cavity (septum, lateral nasal wall- middle or inferior turbinate), or the ethmoid and sphenoid sinuses. The maxillary sinus is the most frequently affected site.

The tumor dimensions are variable, ranging from a few millimeters to several centimeters [7]. Yeon reported a case of cavernous hemangioma of the inferior nasal meatus [8]. Anzai reported in 2020 a case of bilateral cavernous hemangioma of latero nasal wall [9]. Mechanisms for the formation of the tumor are yet to be discovered, and a few factors such as trauma, infection, oncogene, and some hormones are considered to take a role in the occurrence and growth of the tumor. Clinically, vascular anomalies can be sporadic or familial. Tie2 (TEK) is essential for angiogenesis and vascular stabilization [10]. Mutant TIE2, a member of the receptor tyrosine kinase subfamily containing a kinase domain, is a possible factor triggering the expansion of these lesions [11]. Yagisawa suggested that hemangioma and sinonasal organized hematoma are the same pathologic entity, the fact that the vascular lumina of cavernous hemangioma are usually larger than those of OH on histologic examination still raises the question of the probability of the different nature of the two lesions [12].

These lesions typically grow slowly and cause a mass effect on adjacent neurovascular structures, resulting in specific symptomatology. It can cause bone destruction and local remodeling in addition to episodes of repeated acute rhinosinusitis due to interference with the natural drainage of the facial sinuses. The common symptoms of the sinonasal hemangiomas include nasal obstruction, epistaxis, and, occasionally, a visible nasal mass. Cheek swelling and proptosis can also be seen. Symptoms may include headache, recurrent or persistent facial pain (often attributed to teeth), and malar fullness. Kolsi report a case of progressive exophthalmos in 9-year-old young girl secondary to a cavernous hemangioma of maxillary sinus [13]. Sarkar reported a case of intractable anemia secondary to recurrent hemoptysis caused by a cavernous hemangioma of the inferior turbinate [14]. Walch reports a patient consulted for hypaesthesia and recurrent swelling of the cheek in the left infraorbital region. Computed tomography (CT) scan suggested a neuroma (infraorbital nerve canal) but histopathological lecture after removing showed a partially thrombosed cavernous haemangioma [15].

Nasal endoscopy findings are variable. When the lesion is confined within the sinus, the nasal cavity appears normal, sometimes presenting with congestive mucosa or minimal bleeding. However, if the lesion extends into the nasal cavity, a bulging, multifocal hemorrhagic, and friable mass may be observed. Biopsy remains controversial due to the risk of hemorrhagic complications. It should only be performed if necessary (such as when a malignant tumor is suspected) after imaging studies have been obtained, and it requires specific precautions (in patient admission, close observation, or preoperative embolization). Imaging is mandatory for the evaluation and management of sinonasal tumors in general, and particularly for hemangioma variants. The diagnostic workup for sinonasal hemangiomas is based on a CT scan, contrast-enhanced MRI, CT angiography (CTA), magnetic resonance angiography (MRA), and angiography in complex cases or if preoperative embolization is planned. Cavernous hemangiomas are commonly found as heterogeneous hypodense lesions with little contrast uptake on computed tomography scans.

Amorphous or curvilinear calcification is a non-specific finding, whereas phlebolith formation is a more specific finding of cavernous hemangioma, and were not contained in either of the tumors [16]. Computed tomography is the examination of choice for better definition of surrounding bone structures. Kim et al. reported two cases of cavernous hemangioma that caused erosion of the wall of the maxillary sinus, nasal turbinate, and orbit [17]. MRI is the examination of choice for delimitation of the lesion and better diagnostic definition. Results in cavernous hemangioma show a low signal intensity on T1-weighted images and high signal intensity on T2-weighted images [18]. Histologically, cavernous hemangiomas consist of vascular spaces lined with flat endothelial cells containing red blood cells. Diagnosis of nasal mucosal hemangioma should be suspected in patients presenting with profuse epistaxis with a contrast enhancing nasal mass with or without bone remodeling on imaging. A high index of suspicion and a good preoperative evaluation are needed for diagnosis.

Differential diagnosis includes inflammatory polyp, fungal sinusitis benign diseases like haemangioma, inverted papilloma, and malignant conditions like malignant melanoma, squamous carcinoma, and adenoid cystic carcinoma. The long duration of frequent epistaxis and nasal obstruction can aid in differential diagnosis. Organized hematoma is the most difficult lesion to differentiate, both clinically and radiologically, from sinonasal cavernous hemangioma [12]. The mainstay of treatment for cavernous hemangioma is complete surgical excision. Maxillary sinus cavernous hemangioma is usually resected with surgical techniques that provide wide excision, Caldwell–Luc approach or lateral rhinotomy. Recently, a trans nasal endoscopic approach has been employed. Endoscopic medial maxillectomy is a safe and effective approach for the treatment of maxillary sinus diseases [19,20]. The first case in the literature of successful endoscopic removal of a sinonasal cavernous hemangioma was in 2003 [21]. According to some authors, a modified endoscopic surgery approach has been proposed. The aim of this modification is to reduce postoperative morbidity and preserve mucosal function.

This technique consists of preserving the inferior turbinate and the nasolacrimal duct (endoscopic modified medial maxillectomy-EMMM) [22]. It must be highlighted that surgical intervention can lead to sudden, profuse intraoperative hemorrhage. The risk of this mishap is significantly higher with cavernous hemangiomas than with capillary types. Consequently, the use of preoperative embolization remains controversial. Should it be performed systematically or on a case-by-case basis? Furthermore, the morbidity (neurovascular and integumentary injuries) and mortality associated with embolization dictate that this procedure should not be performed indiscriminately [23]. Ultimately, we believe that preoperative embolization should be reserved for voluminous cavernous hemangiomas, or when facing potential surgical difficulties. These include a lack of endoscopic visualization for adequate coagulation, difficulties identifying the tumor's origin, or modifications of adjacent structures that could complicate intraoperative and postoperative management [24].

Conclusion

Sinonasal cavernous hemangiomas may be mistaken for locally aggressive neoplasms. The symptomatology is often non-specific, presenting primarily as recurrent epistaxis and nasal obstruction. Additionally, cheek swelling may be a presenting sign. Imaging is essential and provides a safe method for preoperative evaluation. CT and MRI studies typically demonstrate an expansible, heterogeneous, strongly enhancing mass with bone remodeling and erosive changes, where the presence of phleboliths is a characteristic finding. Endoscopic excision is the most common surgical approach, with or without preoperative embolization. Although it is a very unusual tumor, based on these imaging findings, sinonasal cavernous hemangioma should be considered in the differential diagnosis of paranasal sinus tumors.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and or publication of this article.

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