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Nasal Hemangioma and the Importance of Preoperative Embolization: Case Report and Literature Review

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ABSTRACT: Nasal hemangioma is a rare benign vascular neoplasm, yet clinically significant due to its hemorrhagic potential within a richly vascularized anatomical region. Its therapeutic management requires a multidisciplinary approach, particularly in cases indicated for surgical resection. Preoperative arterial embolization has proven to be an effective tool for controlling intraoperative bleeding, facilitating complete excision, and improving surgical outcomes. This review addresses the epidemiological, clinical, and therapeutic aspects of nasal hemangioma, with emphasis on the role of endovascular embolization as a fundamental component of pre-surgical strategy and in this case, as a definitive treatment.

KEYWORDS: Nasal hemangioma, nosebleed, obstruction, angiography, embolization, coil.

INTRODUCTION

Hemangiomas are benign vascular tumors histologically characterized by abnormal proliferation of endothelial-lined vascular channels. While cutaneous and hepatic localizations are most common, nasal cavity involvement is rare and typically diagnosed in adulthood, unlike infantile hemangiomas. Given the nasal cavity's dense vascular supply primarily derived from the external carotid system this region poses a substantial risk of bleeding during surgical interventions. Such anatomical context justifies the implementation of strategies for adequate preoperative hemostatic preparation, with selective arterial embolization being the technique of choice in most symptomatic cases.

CASE REPORT

We present the case of a 43-year-old male,who attended outpatient consultation with a one-year history (onset in 2023) of leftsided nasal obstruction and recurrent epistaxis, requiring posterior nasal packing on two occasions over the past six months. Nasal endoscopy revealed a mass on the superior lateral nasal wall, near the sphenopalatine foramen.

Imaging included a non-contrast cranial CT scan showing a solid-density mass occupying zones IV and V of the left nasal cavity, with extension into the nasopharynx. (Figure 1) Subsequent MRI of the brain and facial structures confirmed an expansive lesion predominantly involving the left nasal cavity (zones IV and V), with no evidence of orbital or intracranial invasion. (Figure 2)

Histopathological analysis of a biopsy from the left nasal cavity performed in December 2024 revealed findings consistent with a lobular capillary hemangioma (pyogenic granuloma), extensively ulcerated suggestive of a benign vascular lesion.

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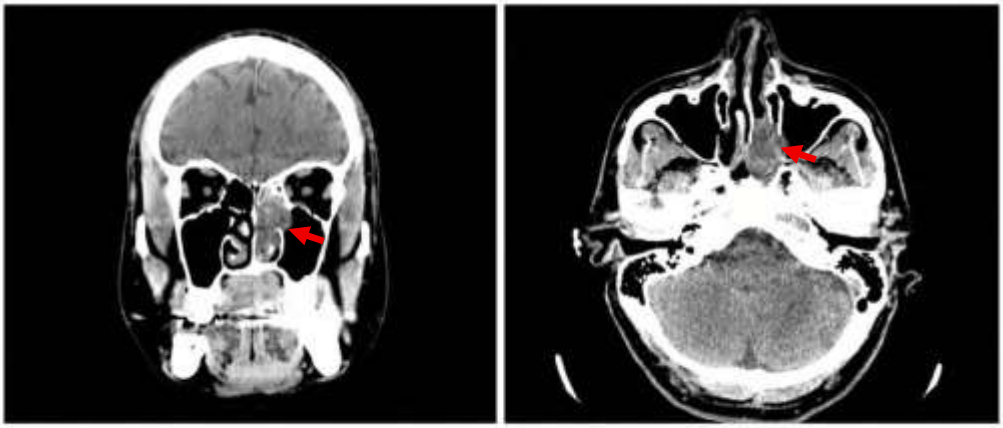

Figure 1. Non-contrast cranial CT scan shows a solid-density mass occupying zones IV and V of the left nasal cavity, with extension into the nasopharynx.

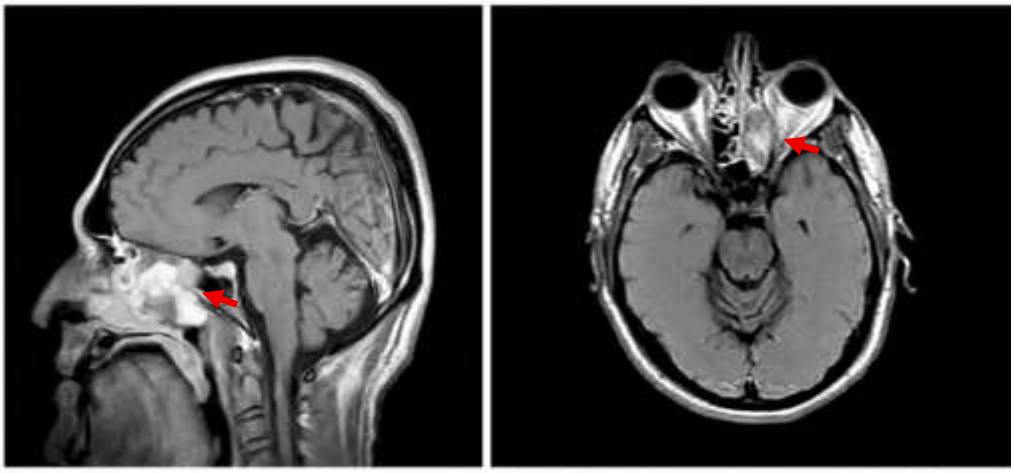

Figure 2. T1-weighted magnetic resonance imaging of the brain reveals a tumor in the left nasal cavity involving regions IV and V.

Treatment involved targeted endovascular embolization. Via ultrasound-guided right femoral artery access, selective catheterization of the left external carotid artery and subsequently the maxillary artery was achieved. Angiography confirmed a vascular lesion consistent with a left nasal hemangioma. Selective perfusion of the superior and inferior branches was performed, followed by embolization using coils (2 mm × 6 mm × 8 cm; 2 mm × 3 mm × 2.3 cm; 2 mm × 4 cm) and calibrated microspheres (500–700 μm) using the "sandwich" technique. Post-embolization angiography demonstrated complete occlusion of the hemangioma with preserved perfusion in the remaining external carotid branches. (Figure 3)

The postoperative course was uneventful, with no bleeding, stable hemodynamics, and no neurological complications. The patient was discharged 48 hours later and remained asymptomatic at one-month follow-up.

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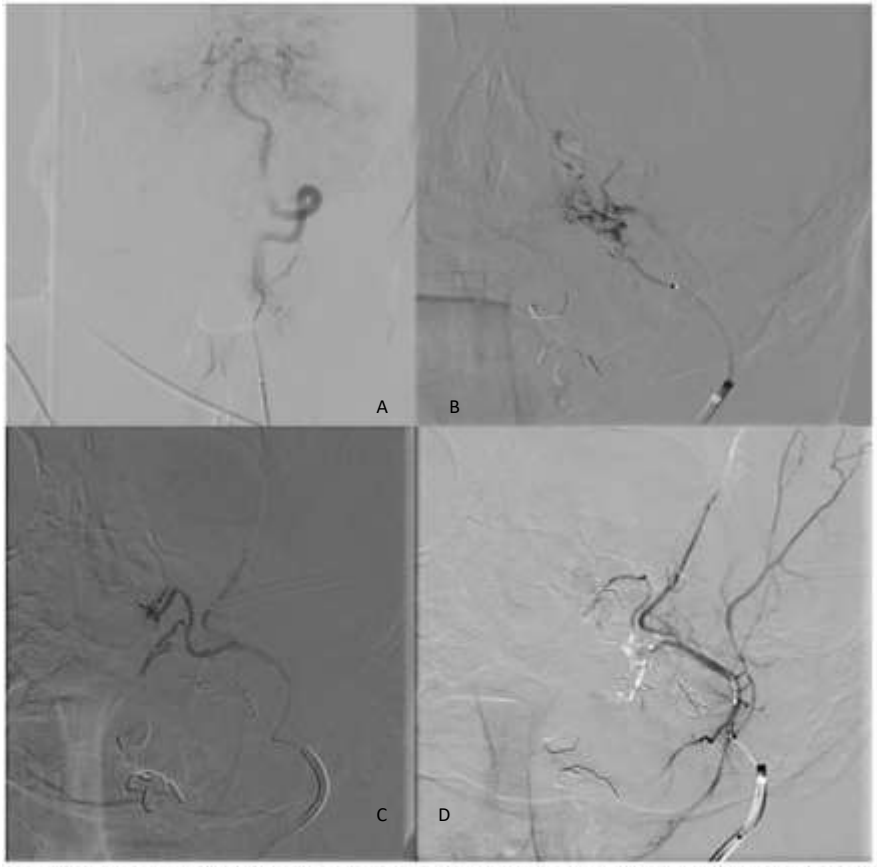

Figure 3. Digital subtraction angiography. (A) Aberrant vascularity consistent with a hemangioma. (B) Coil placement in the inferior collateral artery. (C) Coil placement in the superior collateral artery along with injection of microspheres. (D) Absence of arterial flow to the hemangioma is observed following embolization using the 'sandwich' technique.

DISCUSSION

Nasal hemangiomas account for less than 1% of benign nasal tumors. They are more frequently observed in young to middle-aged women, predominantly in the second to fourth decades of life. While the etiology remains unclear, hormonal influences, nasal trauma, prior surgeries, and genetic predisposition to vascular malformations have been proposed as potential contributing factors. The presence of recurrent or severe unilateral epistaxis in young patients with a nasal mass warrants high clinical suspicion—particularly when supported by nasal endoscopy and radiologic imaging.

Clinically, patients often report unilateral nasal obstruction, serous or mucous rhinorrhea, epistaxis of varying intensity, and occasionally a sensation of pressure or foreign body. On physical examination, a violaceous or reddish mass with smooth or lobulated surface that bleeds on contact may be observed. Contrast-enhanced CT and MRI are critical for evaluating lesion extension and its relationship to adjacent bone or soft tissue structures. Diagnostic angiography not only confirms tumor vascularity but also identifies the primary feeding arteries an essential step before therapeutic embolization.

Definitive treatment of symptomatic nasal hemangiomas is surgical, via endoscopic or open resection depending on size and location. However, direct resection without hemostatic preparation can lead to significant bleeding, impairing surgical visibility, prolonging operative time, and increasing morbidity. Preoperative embolization has demonstrated efficacy in significantly reducing intraoperative blood loss, optimizing the surgical field, and allowing for safer and more precise resection.

The technique typically involves transfemoral selective catheterization of the tumor's feeding arteries commonly branches of the internal maxillary artery, especially the sphenopalatine artery. Once tumor vascularization is confirmed, controlled injection of embolic agents such as polyvinyl alcohol (PVA) particles, calibrated microspheres, gelatin foam, or coils is performed based on vessel caliber and operator expertise. Embolization can be performed on an outpatient basis or with short hospitalization, and resection is ideally performed within 24 to 72 hours to maximize the benefits of reduced tumor perfusion.

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CONCLUSION

Multiple retrospective studies and case series have demonstrated the benefits of preoperative embolization in nasal hemangiomas. In a series by Kim et al., a mean reduction in intraoperative bleeding of 83% was observed in embolized patients versus historical controls. Similarly, Ramírez-García et al. reported 100% complete resection rates in pre-embolized patients, with minimal need for postoperative nasal packing and no major adverse events. These findings support embolization as a key component in the therapeutic algorithm for nasal vascular lesions.

Although rare, nasal hemangiomas can pose significant surgical challenges due to their bleeding propensity. Adequate preoperative planning including diagnostic angiography and selective arterial embolization substantially improves surgical outcomes, reduces complications, and shortens recovery time. In the current clinical setting, preoperative embolization should be considered the standard of care for symptomatic nasal hemangiomas, especially those of large size or with hypervascular features on imaging. In the present case, surgical resection was ultimately not required.

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