

# Preoperative Embolization of Glomangiopericytoma: A Technical Note

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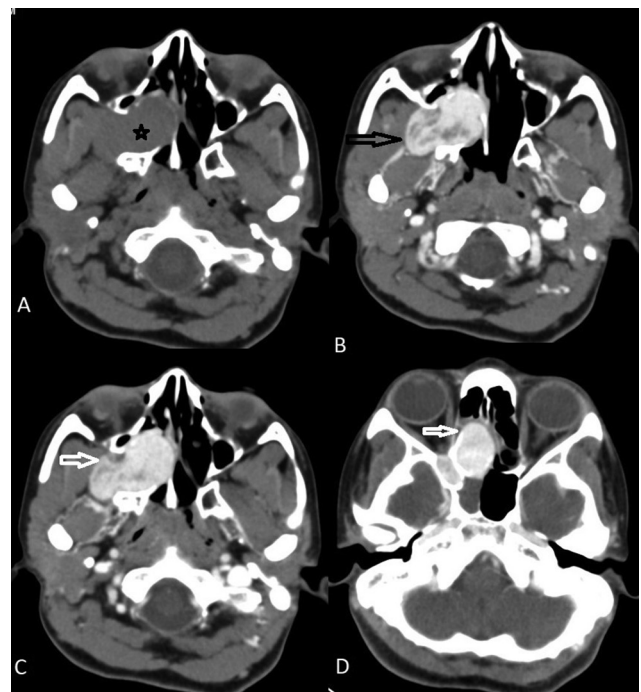
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A 25-year-old female patient presented to ENT outpatient with complaints of intermittent mild bleeding from right side of the nose for five months, right-sided nasal obstruction, and headache for one month. She is not a known hypertensive and did not have any other bleeding manifestations. On examination, mild pallor was present and external nasal examination was normal. There was no sinus tenderness. Anterior rhinoscopy showed a pink-colored mass with smooth surface in the middle meatus, reaching inferiorly up to the floor of the nasal cavity, and anteriorly reaching up to the anterior margin of the middle meatus. The mass was sensitive to touch, but no bleeding was noted. Diagnostic nasal endoscopy showed a reddish smooth ovoid mass in the middle meatus, displacing the middle turbinate medially and reaching up to septum. It did not bleed on touch. Deviated nasal septum with right-sided spur and right inferior turbinate hypertrophy were additional findings. Complete hemogram and routine blood investigations were normal.

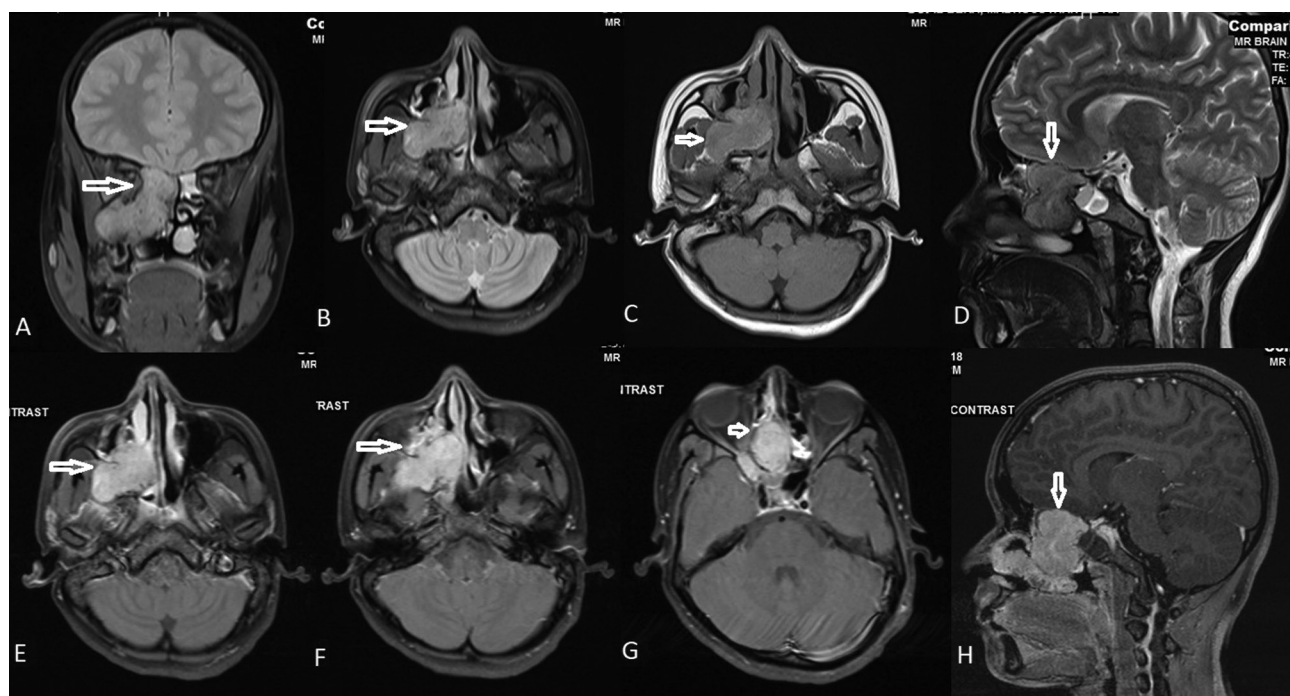
To assess the local extension, computed tomography (CT) was done and it showed a well-defined intensely enhancing lesion with smooth margins in right nasal cavity and infra-temporal fossa with extensions into posterior ethmoid air cells and sphenoparietal recess (►Fig. 1). There was widening of the pterygomaxillary fissure with buckling of the body of pterygoid and posterior wall of maxillary sinus. The mass did not cross midline and was causing buckling of the posterior aspect of the nasal septum. Superiorly, the mass was causing widening of the inferior orbital fissure. No bony erosion was seen. Magnetic resonance imaging (MRI) showed T1 hyperintense and heterogeneously hyperintense T2 mass with similar extension and showed intense enhancement on post contrast scans (►Fig. 2). Biopsy of the mass was done under general anesthesia using diagnostic nasal endoscope. Routine and immune-histochemical stains revealed a diagnosis of glomangiopericytoma. The patient was planned for endoscopic endonasal resection under general anesthesia.

Due to the high vascularity on contrast CT and MRI, preoperative embolization was planned. Digital subtraction angiography (DSA) was done using 5 French Vertebral (Cook)

catheter by selective catheterization right external (ECA) and internal (ICA) carotid arteries. DSA showed a large intense tumor blush supplied predominantly by the sphenopalatine branch of the right internal maxillary branch of ECA with small feeders from vidian artery branches of right ICA (►Fig. 3). There were no feeders from the left ECA or ICA. As the sphenopalatine branch of the internal maxillary artery was a dilated feeder, it was selectively catheterized using the same 5F catheter over 0.035 guidewire (Terumo), and gelfoam slurry in saline and contrast mixture was injected slowly under continuous fluoroscopy roadmap. Post-embolization DSA showed near-complete absence of the tumor blush and slowing of flow in the internal maxillary artery with a small



**Fig. 1** . Preoperative plain (A) and contrast CT (B–D) showing intensely enhancing lesion in the right pterygo-maxillary region (\* in A and arrows) with extension into sphenoparietal recess and inferior orbital fissure. CT, computed tomography.



**Fig. 2** Proton density with fat saturation (PD FS) coronal (A) and axial (B), T1-weighted axial (C), T2-weighted sagittal (D), postcontrast T1-weighted (with FS) (E–G), and sagittal (H) images showing T1/T2 hyperintense lesion (arrows) with homogenous contrast enhancement and similar extension.

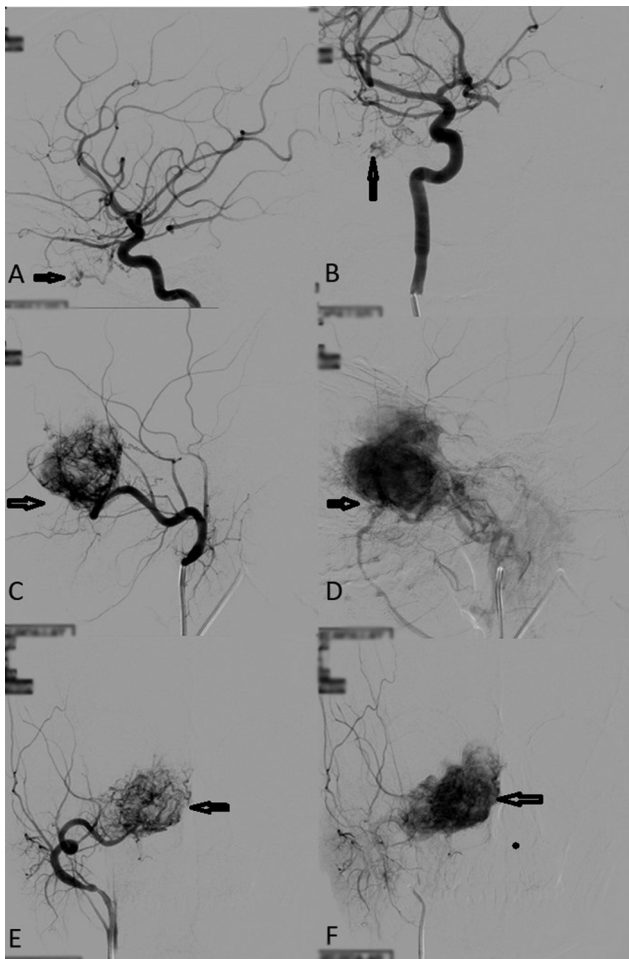
residual blush supplied by the vidian branch of the right ICA (→Fig. 4A). Postembolization, patient developed redness and mild swelling over the right cheek, which was treated with antiinflammatory drugs.

Patient was taken up for surgery two days later. An endoscopic Denver's incision was made and a mucoperiosteal flap was elevated. The inferior turbinate was removed followed by anterior and posterior ethmoidectomy. Medial wall of maxillary sinus was removed to enter the maxillary antrum, followed by removal of the posterior wall of the maxillary sinus to expose the infratemporal fossa. Tumor was delineated and was seen to involve the inferior part of the middle turbinate, lower part of the bony septum, and postero-inferior part of the medial wall of maxillary sinus. It was removed in piece meal from the infratemporal fossa with the microdebrider. Bleeding from vidian artery and internal maxillary artery were controlled using fibrin sealant (evicel), absorbable hemostat (cellulose-based surgicel), and gelfoam kept in layers. Right nasal cavity was then packed with paraffin and acriflavin pack and hemostasis was achieved. Postoperative CT showed complete removal of tumor with nasal pack (→Fig. 4B). The nasal pack was removed sequentially with gradual decompression and was totally removed in postoperative day 4. Histopathology of resected tissue was confirmative of the diagnosis of glomangiopericytoma.

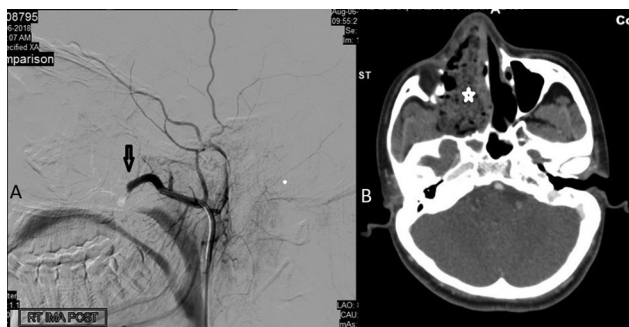
Glomangiopericytomas are considered similar to sinonasal hemangiopericytomas in the recent WHO classification due to their similar immunohistochemical features.<sup>1</sup> Initially described as arising from pericytes, hemangiopericytomas both sinonasal and soft tissue types are now believed to arise from modified perivascular (actin-positive) glomus-like

myoid cell.<sup>2</sup> Watanabe et al<sup>3</sup> in their comprehensive review subdivided the reported cases of sino-nasal hemangiopericytoma into three groups—soft tissue hemangiopericytomas with plump spindle cells showing nuclear atypia, true hemangiopericytomas (previously called as hemangiopericytoma-like tumors) showing myoid differentiation with good clinical outcome, and those reported as nasal glomus tumors. Hemangiopericytoma-like tumor may be confused with angiofibromas and solitary fibrous tumors in the sinonasal location both clinically and on imaging.<sup>4</sup> Imaging may not help to differentiate these rare lesions from the more common antro-choanal polyps and inverted papillomas.

Ledderose et al<sup>5</sup> first reported preoperative selective feeder embolization of a sinonasal hemangiopericytoma using liquid embolic agent Onyx (ethylene vinyl alcohol copolymer in dimethyl sulfoxide) followed by endoscopic resection. Oliveira et al<sup>6</sup> reported a case of glomangiopericytoma fed by the infra-orbital artery who underwent preoperative embolization. Psoma et al<sup>7</sup> used particle embolization (embospheres) preoperatively in their case presenting as right posterior nasal mass with minimal ethmoid and nasopharyngeal involvement. Ciceri et al<sup>8</sup> described percutaneous transnasal devascularization of glomangiopericytoma using low-density liquid embolic agent Squid (similar composition as onyx) as a previous transarterial attempt for embolization was not technically feasible. In our case, we did diagnostic angiogram which showed feeder only from right internal maxillary artery branch supplying the tumor. The embolization procedure was that of any other preoperative embolization of hypervascular mass in the head and neck region. As surgical resection was done in the next few days, we found



**Fig. 3** Digital subtraction angiography (DSA) of right internal carotid artery (ICA) lateral and antero-posterior (AP, [A and B]) showing small vidian artery from the distal petrous ICA supplying the lesion (arrows). Right external carotid artery (ECA) injection lateral (C and D) and AP (E and F) showing prominent internal maxillary artery supplying the vascular lesion through sphenopalatine branches (arrows).



**Fig. 4** Postembolization DSA of right external carotid artery (lateral A) showing near-complete obliteration of tumor blush with slowing in the internal maxillary artery (arrow). Postoperative plain CT (B) showing the air-soft tissue density pack (\*) in the right nasal cavity.

satisfactory reduction in the vascularity using temporary agent like gelfoam instead of more permanent ones like the liquid embolic agents.

#### Acknowledgments

None.

#### Conflicts of Interest

The authors have no conflict of interest.

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