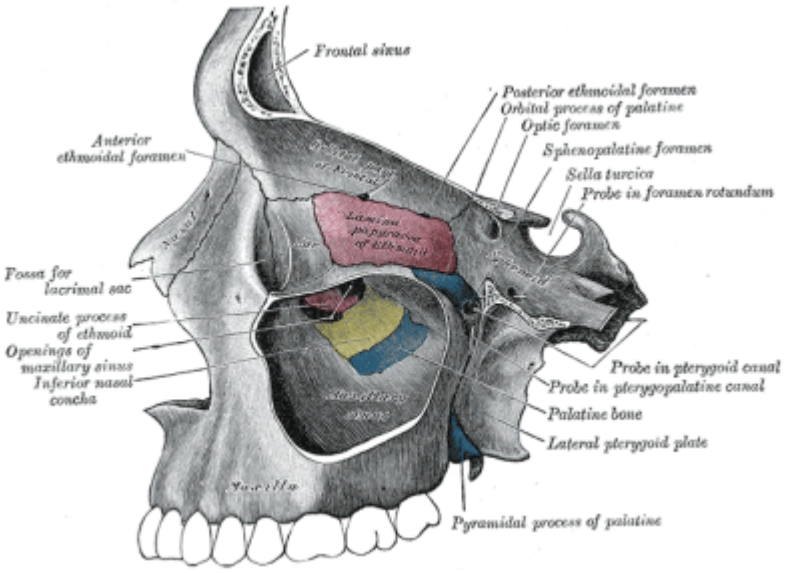
Sphenopalatine foramen



Twelve cadaveric dissections were performed. Following standard nasoseptal flap (NSF) harvest, the distance from the anterior edge of the flap to the anterior nasal spine while pulling the flap anteriorly was measured. As dissection into the sphenopalatine foramen and pterygopalatine fossa (PPF) continued, similar interval measurements were completed in four stages after release from the sphenopalatine foramen, release of the internal maxillary artery (IMAX), and transection of the descending palatine artery (DPA). The extended pedicle dissection technique was performed in seven consecutive patients for a variety of different pathologies.

The mean length of the NSF from the anterior nasal spine and maximum flap reach were 1.91 ± 0.40 cm/9.3 ± 0.39 cm following standard harvest, 2.52 ± 0.61 cm/9.75±1.06 cm following SPA foramen release, 4.93 ± 0.89 cm/12.16 ± 0.54 cm following full IMAX dissection, and 6.18 ± 0.68 cm/13.41 ± 0.75 cm following DPA transection. No flap dehiscence or necrosis was observed in all seven surgical patients.

Extended pedicle dissection of the NSF to the SPA/IMAX markedly improves the potential length and reach of the flap. This technique may provide a feasible option for reconstruction of large anterior skull base and craniocervical junction defects. Seven successful cases are presented here, but further studies with larger series are warranted to validate findings in a clinical setting [1)].

The introduction of the nasoseptal flap for the reconstruction of extended endoscopic approaches decreased the incidence of postoperative fistula. In order to preserve the septal vascular pedicles, many have started to prepare the flap systematically, prior to the opening of the sphenoid rostrum.

The aim of this study is to obtain an average measure of the location of the posterior septal artery using the upper edge of the choana as a landmark.

Ten cadaveric heads, fixed with formaldehyde and injected with colored silicone, were studied. The course, branching pattern and dominance of the branches of the posterior septal artery were recognized, as well as the distance in of its superior and lower branches respect to the medial upper edge of the choana.

In all cases, the posterior septal artery enters as an only vessel through the sphenopalatine foramen. In its sphenoid segment, over the sphenoid rostrum, the posterior septal artery divides into its upper and lower branches, in most cases, laterally to the sphenoid ostium (70%, n=14). The lower branch was dominant in 60% of the cases (n=12). Regarding the mean distance in millimeters from the medial upper edge of the choana to the superior branch, it was 14.45 +/- 0.4102 (18-11.5) and, to the lower branch, 10.9 +/- 0.4682 (14-7).

A rostrum opening up to 15 mm over the upper edge of the choana is safe to avoid vascular complications, and to be able to prepare a viable nasoseptal flap only if it is necessary [2].

Pinheiro-Neto et al., present a surgical technique that completely releases the vascular pedicle of the nasoseptal flap from the sphenopalatine foramen improving considerably the reach of the flap.

A patient with left anterior cranial base fracture involving the posterior table of the frontal sinus, who presented with cerebrospinal fluid leak and contused brain herniation to the ethmoid and frontal sinuses. Unilateral endoscopic endonasal anterior cranial base reconstruction was performed with left sided nasoseptal flap. The nasoseptal flap pedicle was dissected and completely released from the SPA foramen. The flap was left attached only to the internal maxillary artery (IMAX) vascular bundle.

The flap covered the entire left anterior cranial base, from the planum sphenoidale to the posterior table of the frontal sinus. There was complete obliteration of the cerebrospinal fluid fistula postoperatively with resolution of the radiographic pneumocephalus and the patient's rhinorrhea.

The complete release of the nasoseptal flap pedicle from the SPA foramen is feasible and remarkably improves the reach of the flap. It also increases the reconstructive area of the flap since the entire septal mucosa can be used for reconstruction and the pedicle length is based exclusively upon the SPA/IMAX [3].

In the cadaveric material of Eordogh et al., the sphenopalatine foramen is located at the transition of the superior and middle nasal meatus (95.0%) or in the superior nasal meatus (5.0%). It is the main entry point of the branches of the sphenopalatine artery into the nasal cavity. In most cadaveric cases (25.0%), at this level there are 2 branches superiorly and 1 vessel inferiorly to the ethmoid crest. An average of 2.4 vessels leave the sphenopalatine foramen superiorly to the ethmoid crest, 97.8% of them belong to the sphenopalatine arterys posterior septal branches. An average of 2.1 branches leave the sphenopalatine foramen inferiorly to the ethmoid crest; all of them belong to the posterior lateral nasal branches. There are no cases with a single artery at the plane of the sphenopalatine foramen. We describe a triangular bony structure bordering the sphenopalatine foramen anteriorly which is built up by the palatine and ethmoid bone as well as the maxilla. According to the radiographic studies, this triangular prominence is surrounded superiorly by a posterior ethmoid cell (57.4%), the sphenoid sinus (41.7%) or the orbit (0.9%) with a varying contribution of the superior nasal meatus; inferolaterally by the maxillary sinus (98.3%) or the pterygopalatine and infratemporal fossa (1.7%) and inferomedially by the middle nasal meatus. The medial vertex of the bony triangle corresponds to the ethmoid crest of the palatine bone. In transnasal endoscopic surgery, the posterior lateral nasal branches of the sphenopalatine artery appear at the triangle´s inferomedial edge, the posterior septal branches emerge at its superior edge.

The triangular bony structure is a landmark to find and differentiate the posterior lateral nasal and posterior septal branches of the sphenopalatine artery and to identify the sphenoid sinus [4].

References

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