

## **Endoscopic endonasal bony landmarks of vertical petrous internal carotid artery: Anatomic study**

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### **Abstract:**

**Background:** Endoscopic endonasal direct exposure or vascular control of basal internal carotid artery (ICA) is difficult among soft tissue of infratemporal fossa (ITF). **Objective:** The aim of this work is to develop surgical instructional model for direct exposure of vertical petrous (Vp) ICA relatively dependent on bony fixed landmarks. **Methods:** Endoscopic endonasal drilling of 14 sides of dry skull models. Different bony landmarks and measurements of Vp ICA canal were obtained. **Results:** Endoscopic endonasaltranspterygoid approach was performed. The medial pterygoid process and base were drilled to expose the vidian canal and foramen rotundum. The lateral pterygoid process was drilled following the slope of skull base to medial and lateral ends of foramen oval (FO). The spine of the sphenoid was drilled to obscure the tensor tympani canal and Bony Eustachian tube (ET). The bony end of ET was identified lateral to FO. The VpICA was exposed retrograde by drilling the tubal process of tympanic bone (bone between FO and bony ET) downwards, backwards and medially towards carotid foramen forming an acute angle with horizontal petrous(Hp) ICA. The carotid foramen lies medial to styloid process. Three processes are identified sequentially from endonasal perspective; spine of sphenoid, tubal process of tympanic bone and vaginal process of tympanic bone enclosing the styloid process laterally. The mean length of VpICA canal was  $12.93 \pm 2.23$ mm, mean width of FO  $5.04 \pm 0.8$ mm and distance between FO and bony ET was  $6.68 \pm 1.42$ mm representing surgical width of VpICA about 10mm. The surgical corridor was about 10mm wide and 15mm long. **Conclusion:** Endoscopic endonasal systematic orientation of bony fixed landmarks of Vp ICA exposure is described. The proposed endonasal bony pathway relatively bypasses the muscular compartment of ITF. This model can help to obtain vascular control of basal ICA and retrograde identification of parapharyngeal ICA.

### **Keywords**

Endoscopic, endonasal, bony landmarks, vertical petrous, internal carotid artery, skull base.

