



Endoscopic endonasal surgical anatomy through the prechiasmatic sulcus: the key window to suprachiasmatic and infrachiasmatic corridors

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Abstract

Background: Classically, the transtuberculum and transplanum approaches have been utilized to reach the suprachiasmatic and infrachiasmatic corridors. The aim of this study was to provide a better understanding of the key endoscopic endonasal anatomy of the suprachiasmatic and infrachiasmatic corridors provided through selective removal of the prechiasmatic sulcus (SRPS).

Method: A SRPS was performed in 16 sides of 8 alcohol-fixed head specimens. Twenty anatomical measurements were collected on the suprachiasmatic and infrachiasmatic corridors. The transplanum and transtuberculum approaches were also performed.

Results: In the suprachiasmatic corridor, the SRPS exposed the anterior communicating artery (AComm) and the post-communicating segment of the anterior cerebral arteries in all the cases, while the pre-communicating segment of the anterior cerebral arteries, recurrent arteries of Heubner, and fronto-orbital arteries were visualized in 75% (12/16), 31% (5/16), and 69% (11/16) of cases, respectively. In the infrachiasmatic corridor, the ophthalmic segment of the internal carotid artery and superior hypophyseal arteries were always visible through the SRPS. The mean width and height of the prechiasmatic sulcus were 13.2 mm and 9.6 mm, respectively. The mean distances from the midpoint of the AComm to the anterior margin of

the optic chiasm (OCh) was 5.3 mm. The mean width of the infrachiasmatic corridor was 12.3 mm at the level of the proximal margin of the ophthalmic segment of the internal carotid artery. The mean distances from the posterior superior limit of the pituitary stalk to the basilar tip and oculomotor nerve were 9.7 mm and 12.3 mm, respectively.

Conclusions: The SRPS provides access to the main neurovascular and cisternal surgical landmarks of the suprachiasmatic and infrachiasmatic corridors. This anatomical area constitutes the key part of the approach to the suprasellar area. To afford adequate surgical maneuverability, the transplanum or transtuberculum approaches are usually a necessary extension.

Keywords: Endoscopy; Infrachiasmatic corridor; Measurements; Prechiasmatic sulcus approach; Skull base anatomy; Suprachiasmatic corridor.