

Surgical Transposition and Resection of the Medial Wall of the Cavernous Sinus: Surgical Anatomy, Technique, and Outcomes in 86 Patients

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Introduction

Surgical mobilization and/or removal of the medial wall (MW) of the cavernous sinus (CS) remains a surgical challenge.

Methods

The configuration of the MW, its relationship to the internal carotid artery (ICA), and the ligamentous connections in between them were investigated in 40 CSs (20 specimens). A retrospective study of transcavernous pituitary transposition cases and patients with pituitary adenomas with MW resection was performed.

Results

We identified 4 types of parasellar ligaments that anchored the MW to the ICA: 1) caroticoclinoid (present in 98%), connects the upper MW and the middle clinoid to the anterior clinoid; 2) inferior parasellar (95%), anchors the MW to the anterior wall or vertical cavernous ICA; 3) superior parasellar (57%), bridges the MW to the horizontal cavernous ICA; 4) posterior parasellar (45%), anchors the posterior MW to the posterior carotid sulcus.

These ligaments should be identified and transected to safely mobilize the MW away from the cavernous ICA during a transcavernous interdural pituitary transposition approach to the posterior clinoid. This technique was applied in 36 patients with various petroclival lesions achieving complete posterior clinoid process resection (20 bilateral) in all cases, with no ICA or oculomotor nerve injuries.

Learning Objectives

1. To present the surgical anatomy of the medial wall of the cavernous sinus with emphasis on the newly described parasellar ligaments

2. To demonstrate the surgical technique for the selective resection of the medial wall of the cavernous sinus and to analyze the clinical outcomes in a series of 50 patients with pituitary adenomas

3. To show the surgical technique for mobilization of the medial wall of the cavernous sinus as required for the interdural transcavernous pituitary transposition and to present the results of its application in a series of 36 patients with petroclival region lesions

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Results Continued:

We developed a surgical technique for selective resection of the MW in five steps: a) opening of anterior CS wall; b) inferior parasellar ligament transection; c) coagulation of inferior hypophyseal artery; d) cutting of sellar dura floor; e) disconnection of caroticoclinoid ligament. A total of 57 MWs were removed in 50 pituitary adenoma patients (70% functional). Total tumor removal was achieved in all cases with no ICA injury and no permanent cranial nerve palsies. Medial wall invasion was confirmed histologically in 90% with biochemical remission in 97% of functioning tumors.

Conclusions

Understanding of the surgical anatomy of the MW of the CS allows its safe and effective mobilization and resection.

Figure 1 - Parasellar Ligament

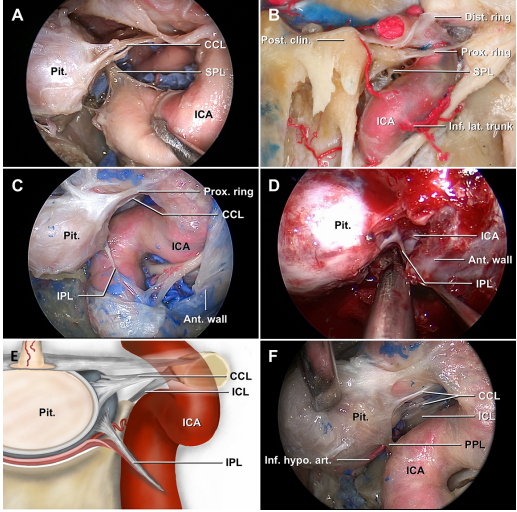


Figure 2 - Step-by-step of medial wall resection.

