

Does Change in Angulation of the Pituitary Stalk After Endoscopic Transsphenoidal Surgery Lead to Diabetes Insipidus?

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Introduction

While it is known DI can occur due to direct intraoperative handling of the pituitary stalk, DI not infrequently develops when the surgeon does not physically manipulate the hypophyseal stalk. It is difficult and often unfeasible to reliably predict which patients are likely to develop DI in these instances. For the first time, we directly investigate if large changes in angulation of the pituitary stalk leads to DI following endoscopic resection of sellar lesions.

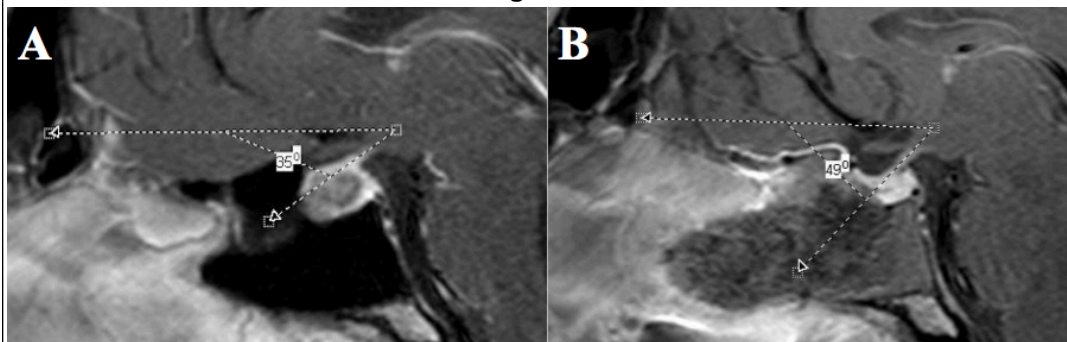
Methods

Patients undergoing endoscopic resection of sellar lesions were retrospectively reviewed. Pre- and postoperative T1 MRIs with contrast were analyzed. The trajectory of the pituitary stalk was measured against a horizontal and vertical reference in the sagittal and coronal planes, respectively (Figures 1, 2). Differences between pre- and postoperative angles (delta sagittal, delta coronal) were calculated. An independent samples t-test compared the delta sagittal and coronal angles between DI and non-DI patients.

Results

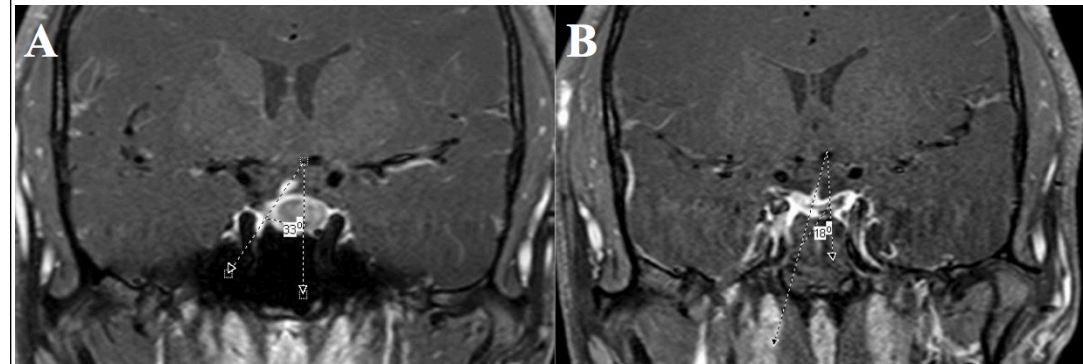
Fifty-eight patients underwent endoscopic for resection of sellar masses who had measurable stalk angles. Most patients were diagnosed with pituitary adenoma (n=48). Six DI patients had calculable delta sagittals and coronals with average stalk trajectories of 18.3° and 12.3°, respectively. In non-DI patients, the average delta sagittal and coronal was 18.7° and 17°, respectively. There was no statistical significance between DI vs. non-DI patients (Delta sagittal: $p=.929$, BCa 95% CI Bootstrap= -8.67, 12.40; Delta coronal, $p=.554$, BCa 95% CI Bootstrap= -7.33, 15.45).

Figure 1.



Sagittal T1 with contrast MRI of the pituitary stalk angle measured against a horizontal reference preop (A) and postop (B) with a delta of 14 degrees.

Figure 2.



Coronal T1 with contrast MRI of the pituitary stalk angle measured against a vertical reference preop (A) and postop (B) with a delta of 15 degrees.

Conclusions

Diabetes insipidus after endoscopic resection of sellar masses sometimes occurs when the pituitary stalk is not directly manipulated, and it is unclear what exactly triggers DI in these instances. There is no significant correlation between development of DI and change in angulation of the pituitary stalk following endoscopic resection. As a result, it remains difficult to predict development of DI when the surgeon does not directly manipulate the stalk and it should therefore not be used in clinical decision-making and counseling of the patient.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of potentially predicting which patients go into DI following endoscopic resection of their sellar mass, 2) Discuss in small groups what post-op radiographic factors may lead to predicting patients at risk for developing DI, and 3) Identify other possible parameters for predicting DI based on routine post-op imaging following endoscopic resection of sellar masses.