Endoscopic transsphenoidal approach case series

2022

Preoperative magnetic resonance imaging and computed tomography scans from patients undergoing ETSS for pituitary tumor resections from 2007 to 2017 were retrospectively evaluated. A neuroradiologist classified these pituitary tumors into six morphologic groups, each defined by volume, dimensions, extension, and shape. Surgical difficulty, rates of incomplete resection, and postoperative complications were then stratified in relation to the morphologic groups.

Results: Pituitary tumors from 131 patients were classified from preoperative imaging into six characteristic morphologies: (1) microtumor, (2) round, (3) transverse oblong, (4) superior-inferior oblong, (5) bilobed, and (6) large lobulated. Tumors that were characterized with the large lobulated, bilobed, and transverse oblong morphologies correlated with higher rates of postoperative evidence of residual tumor (70%, 36%, and 47%, respectively, all $P < 0.002$). Likewise, large lobulated, bilobed, and transverse oblong morphologies were also associated with intraoperative cerebrospinal fluid leaks (70%, 31%, and 35%, respectively, all $P < 0.05$).

Conclusions: We describe a novel descriptive system for the morphology of pituitary tumors that can be determined from preoperative imaging. Different tumor morphologic groups are associated with varying degrees of gross tumor resection, complications, and surgical difficulty. Utilizing pituitary tumor morphology may aid surgeons in planning the extent of resection, need for complex closure, and patient counseling [1].

2020

A prospectively held pituitary database was retrospectively analyzed for all adult pituitary neuroendocrine tumor patients undergoing endoscopic surgery from May 2011 to May 2017. All operations were performed by a single neurosurgeon at a regional center for pituitary surgery. Functioning and non-functioning adenomas were included. Hormonal status was assessed at the most recent follow-up.

Results: One hundred forty-five patients (69 M, 76 F) were included in the study with a median age of 52 years. Median follow-up was 52 months. Eighty-eight patients (61%) were not taking any hormone replacement medications, whilst 57 patients (39%) required hormone replacement therapy (HRT) preoperatively. Preoperatively, 29 patients (20%) had hypothalamo-pituitary-adrenal (HPA) axis dysfunction, 39 patients (27%) had thyroid axis dysfunction, 11 males (16%) and 7 females (9%) had gonadal axis dysfunction, and one patient had preoperative diabetes insipidus. Postoperatively, 26 patients (18%) had a new deficiency in pituitary function, whilst 6 patients (11%) were able to cease HRT. Nineteen patients (13%) had new HPA axis deterioration, 12 (8%) had new thyroid axis dysfunction, 8 males (11%) and 4 females (5%) had gonadal axis deterioration, and 6 patients (4%) had new diabetes insipidus (DI).

Conclusions: The ability to restore pituitary gland function following endoscopic surgery remains limited, whilst new deficits still occur. It is essential that patients are counseled accordingly as

hormonal replacement therapy can have a significant impact on the quality of life. Larger longer-term collaborative studies of endocrine outcome in endoscopic pituitary surgery are needed [2].

2016

Guo-Dong et al., performed a retrospective review of 100 pituitary tumor patients treated by endoscopic endonasal transsphenoidal surgery (ETS) and 147 patients treated by microscopic transsphenoidal surgery (MTS) from January 2007 to July 2014. The tumors were stratified by Knosp classification and modified Hardy classification, and tumor gross total resection (GTR)/remission rate, visual improvement rate, complications, operation time, intraoperative bleeding and length of hospital stay were compared between ETS and MTS.

The GTR rate decreased with increasing Knosp grades for both ETS and MTS, with the rates of 93.3%, 87.5%, 71.4%, 58.8% for ETS and 82.8%, 92.0%, 70.7%, 36.0% for MTS in resecting Knosp grades 0, I, II, and III tumors, respectively. The visual improvement rates increased with increasing Hardy grades, which was 66.7% and 45.5% for Hardy grade B lesion, 72.2% and 71.4% for grade C lesion, and 88.9% and 78.9% for grade D lesion treated by ETS and MTS, respectively. No significant differences were observed for GTR rate, visual outcome and complication rate between ETS and MTS, while ETS resulted in more intraoperative blood loss, longer operative time, and shorter hospital stay than MTS.

These data conclude that, compared with MTS, ETS needs longer operation time and results in more intraoperative blood loss, but appears to achieve higher GTR rate for Knosp grade III pituitary tumors [3].

In 28 patients via entirely endoscopic endonasal transsphenoidal approach with the help of special-designed instruments; performed the procedure bloodlessly within limited time. The skill emphasized bilateral nostrils and four hands technique which was as delicate as possible not to scratch nasal mucosa or injure nasal frame. The special instruments included curette with suction, monopolar electrotome and bipolar coagulation forceps with suction, powered surgical equipments (Diamond Bur, Irrigation Tubing for Blades and Burs for nasal endoscopic surgery). Among 28 patients, there were 16 total resections, 8 subtotal resections, 3 partial resections, and 1 only biopsy due to excessive bleeding and hard nature. Of 19 patients with preoperative visual impairment, 12 patients had postoperative improvement in visual acuity and visual field. All the procedures were finished within 60 to 90 min. Complications seldom occurred except transient diabetes insipidus, especially no nasal-related signs or complications but 1 had epistaxis. The full endoscopic transsphenoidal surgery is a promising approach for pituitary neuroendocrine tumor resection. Multidisciplinary collaboration will lead to optimal cure for the patients. New technique and special-designed instruments can facilitate greatly this procedure [4].

Tabaee et al., performed a retrospective review of data from their institution as well as a systematic review of the literature. The pooled data were analyzed for descriptive statistics on short-term outcomes.

Nine studies (821 patients) met inclusion criteria. Overall, the pooled rate of gross tumor removal was 78% (95% CI 67-89%). Hormone resolution was achieved in 81% (95% CI 71-91%) of

adrenocorticotropic hormone secreting tumors, 84% (95% CI 76-92%) of growth hormone secreting tumors, and 82% (95% CI 70-94%) of prolactin secreting tumors. The pooled complication rates were 2% (95% CI 0-4%) for Cerebrospinal fluid fistula and 1% (95% CI 0-2%) for permanent diabetes insipidus. There were 2 deaths reported in the literature that were both related to vascular injury, giving an overall mortality rate of 0.24%.

The results of this meta-analysis support the safety and short-term efficacy of endoscopic pituitary surgery. Future studies with long-term follow-up are required to determine tumor control [5].

An endoscope was used in transsphenoidal surgery and eventually replaced the operating microscope as the tool for visualization. This study focuses on 50 patients (28 females and 22 males) with a median age of 38 years (range 14-88 years). Initially, four patients underwent operation via a sublabial-transseptal approach using a rigid endoscope in conjunction with an operating microscope. The 48 subsequent operations were performed through a nostril using only rigid endoscopes. Forty-four patients had pituitary neuroendocrine tumors and six had various other lesions. Thirteen patients had microadenomas, 16 had intrasellar macroadenomas, nine had macroadenomas with suprasellar extension, and six had invasive macroadenomas involving the cavernous sinus. Seven patients had recurrent pituitary neuroendocrine tumors and 25 had hormone-secreting adenomas (eight patients with Cushing's disease and 17 patients with prolactinomas). Among the eight patients with Cushing's disease, seven had resolution of hypercortisolism clinically and chemically. Of the 17 patients with prolactinomas, 10 improved clinically with normal serum prolactin levels, four improved clinically with elevated serum prolactin levels, and three had residual tumors in the cavernous sinus. Among the 19 patients with nonsecreting adenomas, 16 underwent total resection and three subtotal resection leaving residual tumor in the cavernous sinus. Postoperatively, all patients who had undergone endonasal endoscopic surgery had unobstructed nasal airways with minimal discomfort. More than half of the patients required only an overnight hospitalization [6].

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