Somatotroph pituitary neuroendocrine tumor surgery

- A supervised machine learning approach for predicting the need for postsurgical intervention in acromegaly
- Predictive factors for post-therapeutic biochemical discordance in acromegaly: a monocentric analysis of 156 cases
- Multidisciplinary Management of Pituitary Neuroendocrine Tumors During Pregnancy: Institutional Report
- Comparison of the clinical and prognostic characteristics of patients with different pathological types in acromegaly
- Cervical osteophyte complex causing compressive myelopathy leading to a diagnosis of acromegaly
- Navigating prognostic strategies for GH- and PRL-secreting pituitary neuroendocrine tumors: key insights from a clinicopathological study
- SSTR2 expression in neoplastic and normal anterior pituitary is impacted by age, sex, and hormonal status
- Immune checkpoint inhibitor therapy for aggressive pituitary neuroendocrine tumors

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The resection via a transsphenoidal approach is able to induce a long-term remission of acromegaly, with low risk of recurrence and complications. Endoscopic endonasal transsphenoidal approach is more suitable than microscopic technique in macroadenomas and adenomas with suprasellar extension [1].

Surgical removal of as much tumor mass as possible is usually considered the first step of treatment in acromegaly, unless the patients are unfit for surgery or refuse an operation. To date, in almost all cases, minimally invasive, transsphenoidal microscopic or endoscopic approaches are used. Whether a curative approach is feasible or a debulking procedure is planned, can be anticipated on the basis of preoperative magnetic resonance imaging. It mostly depends on localization, size, and the invasive character of the lesion. The surgical results depend on tumor-related factors such as size, extension, the presence or absence of invasion, and the magnitude of IGF-1 and growth hormone oversecretion, respectively. However, even surgeon-related factors such as experience and case load of the centers have been shown to strongly affect surgical results and complication rates. A reoperation can be considered at various stages in the treatment algorithm. There are several new technical gadgets which might aid in the surgical procedure: navigation, the Doppler probe, and variants of intraoperative imaging [2].

see Transsphenoidal approach.

Endoscopic endonasal approach

Acromegaly patients present a particular challenge to the endoscopic skull base surgeon. Despite

preoperative anesthesia and otolaryngology evaluation, many of these patients will experience an unanticipated airway challenge during intubation. Preoperative preparation and perioperative awareness of anatomic and physiologic abnormalities of acromegalic patients is essential for successful endoscopic surgery in this unique population [3].

From the beginning of the 20th century, acromegaly could be treated by pituitary surgery and/or radiotherapy. After 1970, medical therapies were introduced that could control acromegaly. First, dopamine agonists were introduced, followed by somatostatin analogues and GH-receptor blockers.

Now surgery is the first-line therapy for patients with surgically accessible lesions. Surgery provides the greatest value for management of patients with acromegaly. However, in accordance with the Acromegaly Consensus Group's recent recommendations, somatostatin analogs provide the greatest value and should be used as first-line therapy for patients who cannot be managed surgically. At present, the substantial cost is the most significant negative factor in the value of medical therapies for acromegaly [4].

Postoperative assessment

Postoperative assessment of acromegaly activity is typically performed at least 3 months after neurosurgery (NS). Few studies have evaluated the use of early postoperative growth hormone (GH) levels as a test to predict short- and long-term remission of acromegaly.

D1-rGH could be a highly specific test for the early diagnosis of long-term acromegaly persistence, which is predicted by a value > 2.5 ng/mL with a great degree of certainty. The diagnostic performance of D2-rGH was insufficient. Further research is required to validate these preliminary results prior to modifying the postoperative management of acromegaly [5].

The endoscopic endonasal approach in 214 cases was achieved in 134 (62.6%) of 214 patients. One hundred sixty-nine patients were primary cases, and of these 109 (64.5%) were cured, whereas 61 patients were previously operated cases and of these 25 (41%) were cured. With a 51.1% decrease in the 1st month postoperatively, IGF-I levels were found to be predictive of cure (74.4% sensitivity and 73.7% specificity). Cut-off values for GH levels in predicting cure for the 1st day, 1st week, and 1st month postoperatively were 2.33, 2.05, and 2.25 µg/L, respectively. The cut-off value for surgical experience was 57 for primary surgeries (58.5% cure rate before this cut-off value compared with 72.6% after it; $p = 0.025$) and 108 for all operations (45.8% vs. 79.4%, $p = 0.037$). Although 28 patients were found to be in remission according to the criteria in 2000, they were not in remission according to the new consensus criteria. Nine of these cases (32.1%) had random GH levels < 1 µg/L at the 1-year follow-up. The 1-year IGF-I and GH levels in these 28 patients showed no significant difference when compared with the cases defined as cured according to the current criteria.

In acromegaly treatment, transsphenoidal endoscopic surgery performed by an expert senior surgeon and increased surgical experience are important for higher cure rates. Random GH levels < 2.33 µg/L after the 1st day postoperatively and a > 50% decrease in IGF-I levels after the 1st month

postoperatively are predictive of cure. Moreover, there is no urgency for additional therapy in patients with GH levels of 0.4-1 µg/L and MRI sequences showing no tumor at the 3-month follow-up, because for these cases remission can be achieved at the 1-year follow-up [6].

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