



Video Abstract

Expanded endoscopic endonasal approach for resection of residual parasellar growth hormone-secreting pituitary adenoma in a patient with kissing internal carotid arteries: Technical nuances

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ABSTRACT

Background: Growth hormone (GH)--secreting pituitary adenomas can be aggressive and difficult to manage. Surgical resection for GH-secreting tumors remains the gold standard with increasing use of expanded endoscopic endonasal (EEA) techniques. Certain anatomical considerations make postsurgical biochemical remission challenging.

Case Description: We describe the case of a 43-year-old male presenting with acromegaly after a lack of biochemical remission from a previous surgery. Resection of the residual tumor invading the retrogenu compartment of the cavernous sinus was challenging for several reasons: (a) its location adjacent to the right parasellar horizontal internal carotid artery (ICA) with involvement of the medial wall, (b) the large kissing bilateral ICAs reducing the intercarotid distance, and (c) potential scar tissue. EEA was undertaken with key surgical steps, including wide bilateral sphenoidotomies, right middle clinoidectomy to access the clinoidal ICA and the retrogenu compartment, identification of the top of the paraclival ICA by drilling across the sella floor, division of the sellar floor dura to increase the intercarotid distance and transcavernous mobilization of medial wall, and the tumor capsule away from the horizontal parasellar ICA and across to the diaphragm and pituitary gland. Postoperatively, biochemical remission was achieved with no new endocrine deficits.

Conclusion: These surgical nuances permit biochemical remission in complex revisional cases with acromegaly.

Keywords: Expanded, Endoscopic, Endonasal, Acromegaly, Residual

[Video 1]-Available on:
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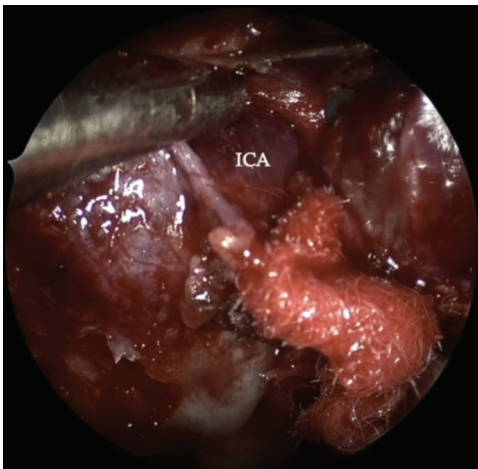
Annotations^[1-7]

00:00 – Title

Expanded endoscopic endonasal approach for resection of residual parasellar growth hormone secreting pituitary adenoma in a patient with kissing internal carotid arteries (ICAs). Technical nuances.

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Video 1: Operative video for expanded endoscopic endonasal approach for resection of residual growth hormone secreting pituitary tumor.

00:14 – Clinical Presentation

The case concerns a 43-year-old male with acromegaly. His initial surgery was 2 years prior with lack of biochemical remission¹⁻⁵. An up to date MRI showed a residual nodule in the retro genu compartment of the cavernous sinus with a narrow intercarotid distance⁶. An expanded endoscopic endonasal approach was recommended with key technical nuances being wide bilateral sphenoidotomy, right middle clinoidectomy to access the clinoidal ICA and the anterior wall of the cavernous sinus as well as the retro genu compartment. Identifying the top of the paraclival ICA and posterior genu by drilling the floor of the sella⁷. Importantly the dura of the sellar floor was divided to increase the working distance between the ICAs. This was then followed by full tumor resection along the horizontal segment of the ICA along with the medial wall and across to the diaphragm. The reconstruction was done with a synthetic dural substitute. Postoperatively, the patient had gross total resection with biochemical remission, and there was no new endocrine deficit.

01:22 – Imaging

Imaging at initial presentation shows the lesion in the inferolateral aspect of the sella with its close proximity to the internal carotid arteries which are rather close. After the first surgery, a residual nodule can still be seen, both in the retro genu compartment on the sagittal cuts as well as inferior to the horizontal parasellar ICA on the coronal imaging. Once again, the proximity to both internal carotid arteries can be appreciated. The asterisk on the CT demonstrates the middle clinoid which required removal. A postoperative imaging which was not carried out with contrast shows gross resection of the lesion as well as the bone removal including the middle clinoidectomy.

02:13 – Intraoperative Video

Sphenoid septations are being drilled, and the exposure is taken superiorly to the tuberculum. We now laterally perform the middle clinoidectomy to expose the clinoidal ICA as seen by the asterisk. The clinoidal ICA is then further uncovered, and this is confirmed by the doppler. We now go along the floor of the sella and drill the bone in order to identify the top of the paraclival ICA and the posterior genu. This is then followed by the out-fracturing technique to identify the posterior genu. We then divide the dura of the floor of the sella to increase the distance between the carotids. Here, we are working and mobilizing the medial wall away from the ICA using the transcavernous technique. And you can see the cavernous sinus bleeding. We are also identifying and resecting the tumor nodule at the same time. Any bleeding is controlled with a hemostatic agent. We now divide the dura superiorly in order to increase our intercarotid working distance as well. Here now, we see the removal of the capsule of the tumor away from the pituitary gland with further sequential removal of the tumor along the horizontal ICA. And one can appreciate the divided sellar floor. We continue the tumor removal. The diaphragm can be seen as denoted by asterisk. The capsule of the tumor is coagulated on the gland.

Ethical approval

Institutional Review Board approval is not required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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