Endoscopic endonasal approach for clipping of a PICA aneurysm

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This video depicts the case of a 59-year-old woman that presented to the emergency department with the worst headache of her life. CT showed subarachnoid hemorrhage and digital subtraction angiogram demonstrated a right-side posterior inferior cerebellar artery (PICA) aneurysm. Given the medial and ventral position of the aneurysm, deep to the lower cranial nerves, which obviated distal control from an open approach, and the absence of an endovascular option able to reliably preserve the PICA, an endonasal approach was offered. A far medial approach was performed, and the aneurysm was successfully clipped. The patient developed a postoperative CSF leak with persistent posthemorrhagic hydrocephalus treated with reexploration and an eventual ventriculoperitoneal shunt. The patient was discharged without neurological deficits.

The video can be found here: https://youtu.be/_9hsM2CaMow.

KEYWORDS endonasal endoscopic approach; aneurysm clipping; PICA aneurysm; surgical video
carefully dissect first the distal and then the proximal vertebral artery. Proximal temporary control is ensured, and the further removal of subarachnoid blood is performed. We can see the sixth nerve exiting the brainstem and the vertebra-basilar junction. In dissecting the aneurysm there is some difficulty in visualizing the proximal PICA, but with some effort we are able to see it. This does cause some small amount of bleeding from this very tenuous aneurysm. A single straight clip is placed initially across the approximal neck of the aneurysm. This does result, unfortunately, in further bleeding from the aneurysm. For control we now place a temporary clip proximally on the vertebral artery and then removal of the clip shows that we still have some bleeding from the distal vertebral as expected, and we are able to replace the clip with some control over the aneurysm. The beauty of this approach is that given how ventral and medial the aneurysm is we are able to trap the artery when we deal with a rupture like this. Our initial clip placement is evaluated. We are able to see the lower cranial nerves distal on the other side of the aneurysm, and we can see, unfortunately, a small residual at the takeoff of the PICA.

3:36 As you can see, this aneurysm sits directly behind the lower cranial nerves and any open approach would lead to significant manipulation of them and is extremely difficult with distal control. To reposition the clip, we place our proximal clip again. Very significant bleeding again from the aneurysm. Attempted replacements are not particularly successful without distal control. We plan now, after replacement of that clip, for a trapping of the aneurysm. Here we trap the vertebral artery temporarily; there is some difficulty in visualizing the proximal PICA, but with these temporary clips in place we have complete control over the aneurysm. The approximal neck of the aneurysm. This does result, unfortunately, in further bleeding from the aneurysm. For control we now place a temporary clip proximally on the vertebral artery. Proximal temporary control is ensured, and we can see, unfortunately, a small residual at the takeoff of the PICA.

4:18 Reconstruction is performed with multilayer collagen and then a large piece of fascial lata, which covers the entire defect all the way down to the nasopharynx in between the level of the carotid artery. This is filled with fat to prevent the development of an encephalocele, and then the nasoseptal flap is placed over the entire defect. Indocyanine green angiography is again performed to confirm vascularity of both the RP flap and the nasoseptal flap. Postoperative angiogram confirms obliteration of the aneurysm and preservation of PICA.

5:40 Postoperative course was complicated by posthemorrhagic hydrocephalus, which resulted in a CSF leak which required a revision and ultimately a ventriculoperitoneal shunt for treatment of the hydrocephalus.

References

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Disclosures
The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this publication.