Transcallosal approach to the contralateral ventricle

Technical note

DANIEL G. NEHLS, M.D., CPT, MC, USA, STEPHEN R. MARANO, M.D., AND ROBERT F. SPETZLER, M.D.
Division of Neurological Surgery, Barrow Neurological Institute, Phoenix, Arizona

Recent experience with an intraventricular arteriovenous malformation (AVM) demonstrated the usefulness of a transcallosal approach to the contralateral ventricle. Although this technique provides excellent exposure, its application has not been stressed in the literature. A brief description of the technique and its value is presented.

KEY WORDS  intraventricular lesion arteriovenous malformation lateral ventricle transcallosal approach operative technique

The transcallosal technique has recently enjoyed wide popularity for approaching lesions in the region of the third ventricle. Since its description by Dandy in 1922, it has been shown to be safe and effective for dealing with various lesions. The transcallosal approach has also been used with success for lesions within or adjacent to the lateral ventricle. We recently had the opportunity to use this technique to treat an arteriovenous malformation (AVM) arising from the floor of the left lateral ventricle. We elected to use a crossed approach (that is, with our craniotomy on the contralateral side) in an attempt to gain additional exposure laterally in the ventricle. We were impressed with the advantages that this approach provided in dealing with this lesion. Although this technique is mentioned in passing in the literature, we believe that it deserves special attention.

Operative Technique

The patient was an 18-year-old right-handed woman who presented with several minor intracerebral hemorrhages over a period of several weeks. Angiography (Fig. 1) demonstrated the lesion which was fed by the anterior choroidal and medial posterior choroidal arteries. The AVM drained through a choroidal vein into the thalamostriate vein. A pseudoaneurysm was visualized, which appeared to change in configuration on serial angiograms. There was no major vein that would interfere with a transcallosal approach on either side of the superior sagittal sinus.

Because of the lateral location of the lesion, it was decided to approach the AVM via a transcallosal procedure through a contralateral craniotomy. The patient was placed in the supine position with her head rotated to the left. A U-shaped incision was made in the parietal region, with the pedicle situated across the midline on the left side. A right parietal bone flap was developed using three burr holes placed in the midline.

The dura was opened in a horseshoe shape, with the pedicle based along the superior sagittal sinus. As predicted by the angiogram, no significant bridging vein was present. The corpus callosum was approached in the standard manner, except that the course was angled toward the opposite lateral ventricle. This was accomplished by gently retracting the falx, with the displacement greatest at the free edge of the falx (Fig. 2). The pericallosal arteries were separated, and the left artery was retracted laterally and superiorly a small distance. The left lateral ventricle was entered through a 2-cm incision, slightly to the left of the midline. The AVM was readily identified within the ventricle, and the large pseudoaneurysm was carefully dissected. The feeding vessels were serially coagulated, as was the venous aneurysm. It was elected not to attempt to remove a small portion of the AVM that was located in the thalamus.

Postoperative angiography demonstrated obliteration of the aneurysm and AVM except for the intrathalamic portion. When she was seen at follow-up examinations 1 and 6 months after discharge, the patient’s neurological condition was normal.
Transcallosal ventricular approach

Discussion

The transcallosal approach provides excellent access to lesions in and around the lateral ventricle. Most authors have advocated an ipsilateral approach, although the use of the contralateral approach has been noted. A crossed approach was used by Shucart and Stein in two of 13 patients with intraventricular lesions. In a review of the Shucart and Stein article, Ehni stressed that it is possible to enter either the ipsilateral or contralateral ventricle by angling the callosal incision, and advocated that the side for the craniotomy be chosen based upon the anatomy of the bridging veins entering the superior sagittal sinus.

We found that the contralateral approach provided superb access to our patient’s lesion. It is particularly well suited to lesions located laterally in the ventricle, as the surgeon’s line of vision is angled into the ventricle. This area may be difficult to expose using the standard ipsilateral approach without excessive traction on the cingulate gyrus and corpus callosum. In using this technique, we recommend that the patient be placed in the supine or park-bench position so that the sagittal suture is nearly horizontal. This directs the callosal opening in a horizontal plane and allows the surgeon to use an instrument in each hand without obscuring the operative field. We suggest that the side with the lesion be positioned downward so that the surgeon may work in a comfortable manner.

One must take care to protect the superior sagittal sinus. This is accomplished by angling the medial retractor in such a way that the bulk of the retraction occurs near the free margin of the falx, and limited retraction is placed at the sinus. Additional angulation could be gained by incising the inferior aspect of the falx to create a hinged door of the falx, although we did not find this necessary.

Conclusions

When the position of the bridging veins entering the superior sinus permits, the transcallosal approach provides an excellent route to the lateral aspects of the contralateral ventricle.
References


Manuscript received June 14, 1984.

The views of the authors are their own and do not purport to reflect the position of the Department of the Army or the Department of Defense.

Address reprint requests to: Robert F. Spetzler, M.D., Division of Neurological Surgery, Barrow Neurological Institute, 350 West Thomas Road, Phoenix, Arizona 85013.