Preoperative Embolization of a Hemangioblastoma

Surgery for hemangioblastoma is complicated by the tumor's rich vascularity. Preoperative embolization has been used to decrease intraoperative bleeding for arterovenous malformations, meningiomas, glomus tumors, and angiofibromas but not, to our knowledge, for an intraxial tumor.

Case Report

The patient is a 14-year-old boy with a family history of von Hippel-Lindau disease. The boy's father died from intracranial manifestations of the disease. Sixteen months before this admission to the hospital, the patient was found to have two cerebellar hemangioblastomas, and one was removed. Blood loss at surgery was 600 ml, and achieving hemostasis was difficult. The remaining tumor was relatively small and asymptomatic and was left alone. The patient was well at first, but 13 months after the surgery, he began having increasingly frequent headaches, occasional dizzy spells, and progressive left-sided apraxia. A CT scan showed that the tumor had at least doubled in diameter and that hydrocephalus had developed; repeat surgery was contemplated. Because of the excessive bleeding during the patient's previous operation, the surgeon asked us to embolize the lesion preoperatively, and we agreed to do this.

Angiography (Fig. 1A) showed that the tumor's blood supply was solely from the left superior cerebellar artery. We placed a Tracker-18 catheter* into this artery (Fig. 1B) and provoked it with a 40 mg Amytal (amobarbital). This failed to elicit any significant change in the patient's mild left-sided apraxia. We then embolized the artery with 200–300 μm of polyvinyl alcohol foam particles† suspended in lohexol (300 mg/ml). This was done with constant fluoroscopic monitoring during the injection [1]. Angiography immediately after embolization (Figs. 1C and 1D) showed that the tumor was essentially devascularized except for a single central nodule and a thin minimally vascular rim inferiorly.

At surgery the next day, the tumor was removed in one piece; total blood loss was 200 ml. Within 1 day, the patient was up and about without any new neurologic deficit. Recovery was uneventful, and the patient was discharged on the 10th postoperative day.

Discussion

Embolization has become an increasingly safe and widely accepted procedure. The case described here represents an unusual, for now, extension of the technique. This embolization was done reluctantly and only after extensive discussions with both the patient and his mother. We described in detail the likely outcome; namely, an increased neurologic deficit. We finally decided to do the procedure when it seemed clear that surgery was necessary and that surgery unassisted by preoperative embolization would be more hazardous than the risk of infarcting a nondominant cerebellar hemisphere by embolization. The outcomes of both embolization and surgery were fortunate in this case, but the decision to embolize an intraaxial lesion must still be made on a case-by-case basis.

REFERENCE


* Target Therapeutics, Mountain View, CA.
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‡ Winthrop-Breon Laboratories, New York, NY.

Fig. 1.—Preoperative embolization of a hemangioblastoma.

A. Anteroposterior arterial phase of right vertebral angiogram shows densely staining rim and parenchyma of tumor interspersed with nonstaining cystic spaces. Arrows indicate left superior cerebellar artery.

B. Left superior cerebellar arteriogram shows that tumor vascularity is much greater than predicted from vertebral angiogram. Arrow points to tip of Tracker catheter in anterior pontine segment of superior cerebellar artery.

C. Postembolization arteriogram shows persistent mass effect but good filling of normal branches of superior cerebellar artery. This late phase shows staining of central nodule only (black arrow) and a shaggy inferior rim (white open arrows). Although a rim of stain continues to encircle lesion (arrowheads), it is thin and regular except for its inferior portion and, since it was not seen on the early phase, it most likely represents normal cerebellar surface compressed by tumor. Proof was surgical: margins did not bleed.

D. Postembolization right vertebral arteriogram shows ambient (arrowheads) and quadrigeminal (curved arrow) parts of superior cerebellar artery. Tumor stain is grossly absent.