Migration of subdural atrial shunt catheter into the pulmonary arteries

Case report

GIORGIO CARBONIN, M.D.
Division of Neurological Surgery, Civic Hospital, Teramo, Italy

A rare case of migration of a distal catheter from a subdural atrial shunt into the pulmonary arteries is presented. The indication for surgical treatment is briefly discussed.

KEY WORDS □9 subdural hygroma □9 subdural atrial shunt □9 pulmonary artery □9 shunt complication

THERE have been many reports of malfunction of ventriculoatrial shunts due to disconnection and migration of the cervical portion of the catheter toward the vena cava and the heart. This event has become rare since the use of one-piece catheters reaching from the end of the valve to the atrium, and using a connector that allows ligature of the catheter at its entry into the draining vein (jugular or its feeder).

In the following case the catheter became separated from the distal part of the valve and migrated into the pulmonary arteries.

Case Report

This 43-year-old man was involved in a serious car accident and was brought to the emergency room on November 18, 1974, in a coma.

Examination. He had conjugate deviation of the eyes toward the left, isocoria, and normally reacting pupils. There was a large, lacerated, and contused wound of the scalp in the parietal region. He showed no signs of neck stiffness, but did not respond to painful stimulation. The right clavicle and femur were fractured. X-ray films showed no fracture of the skull.

Tendon reflexes were absent and there was a tendency to a bilateral dorsiflexion of the big toe.

The patient was intubated. After several days, coma decreased and the endotracheal tube was removed. A carotid angiogram performed 10 days later showed the presence of bilateral subdural frontoparietal hygromas.

Operations. Through bilateral drill-holes anterior to the coronal suture, we removed 90 cc of clear liquid from the right side and 40 cc from the left. Subsequently the patient became decorticate. A brain scan and a second arteriogram performed 52 days after the accident, revealed a recurrence of the hygromas. The drill-holes were reopened and more clear liquid was drained out. Two Holter catheters were then inserted subdurally, and connected with a valve (Fig. 1), which was itself connected with a one-piece distal tube draining into the right atrium through the jugular vein.

Postoperative Course. The postoperative course was normal, the patient improved and, after orthopedic treatment of the fractured clavicle and femur, he was dismissed with residual paresis of the left leg.

Chest films taken 3 months later demonstrated the juguloatrial tube stretched beyond the atrium (Fig. 2 left), but this alteration of position was not given enough attention. About 1 year later, the patient came back for a follow-up examination. Skull films revealed disconnection of the distal tube from the valve (Fig. 2 right).
right) and its migration into the pulmonary arteries (Fig. 3).

**Discussion**

In many cases of disconnection and migration of the distal part of the tube after ventriculooatrial shunt, the part displaced is that beneath the ligature of the connection, at the entry into the jugular vein. These cases are caused either by the knots becoming untied or by the thread becoming too tight and cutting the tube. In the present case the tube was a single piece extending from the valve to the atrium, and it is difficult to believe that all the knots at both the valve and at the jugular connection became untied. We can only suppose that by mistake we used reabsorbable thread instead of silk.

**Fig. 2.** *Left:* Chest film taken 3 months after the operation showing the presence of the juguloatrial tube extending far beyond the atrium. *Right:* Lateral skull film showing the distal draining tube disconnected from the valve.
FIG. 3. Anteroposterior (left) and lateral (right) views of the chest films showing the long tube with one tip in the main branch of the right pulmonary artery and the other tip in the inferior branch of the left pulmonary artery.

Usually, in cases like this, it is mandatory to remove the foreign body from the arteries as soon as possible, in order to prevent the danger of multiple emboli. Our cardiovascular surgical consultant confirmed such a course in routine cases, but advised against operation in this patient because there was a strong possibility that the tube was already encased in the artery wall. In fact, at x-ray examination, the tube did not show any flapping synchronous with cardiac pulse. It was thought that the operation could create more sources of emboli than the tube itself. The useless valve and the subdural catheters were removed without complications.

The patient is periodically checked and, apart from the residual paresis of the left leg, he is doing well 3 years later.

References

Address reprint requests to: Giorgio Carbonin, M.D., Ospedale Civile, 64100 Teramo, Italy.