BIVENTRICULAR HYDROCEPHALUS SECONDARY TO OCCLUSION OF BOTH FORAMEN OF MONRO

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SUMMARY:

One patient with biventricular hydrocephalus secondary to obstruction of both foramen of Monro diagnosed by computed tomography is reported. The patient was treated by two ventricular catheters using a "T" connector. Recognition of this entity is important from both the therapeutic and prognostic standpoints.

KEY WORDS:

Biventricular Hydrocephalus, Foramen of Monro, Ventriculoperitoneal Shunt

INTRODUCTION:

The usual causes of obstruction at the foramen of Monro are neoplasm of the 3rd ventricle, ventriculitis, intraventricular haemorrhage, arteriovenous malformation, subependymal gliosis and overdrainage of one lateral ventricle following a shunt operation, resulting in functional occlusion of the foramen of Monro (1-4,7-11,13). Congenital atresia of the foramen of Monro is rare (12-14).

Obstruction of one foramen of Monro results in unilateral hydrocephalus as an uncommon entity; biventricular hydrocephalus due to obstruction of both foramen of Monro is more rare.We report here one case of biventricular hydrocephalus in an adult presenting with raised intracranial pressure.

CASE REPORT:

A 23-year-old man presented with increasing headache and vomiting of 7 days duration. We learned that the patient had two episodes of gram negative bacterial meningitis 5 years and 20 days ago.

Examination revealed cognitive dysfunction and papilloedema. Visual acuity was normal. There were no lateralizing neurological signs.

Haematological and biochemical investigations were normal. Computed Tomography (CT) showed symmetrical dilatation of both lateral ventricles without any intraventricular septa (Fig. 1-A). The 3rd ventricle was slit and there was no neoplastic abnormality around or in it (Fig. 1-B). Bilateral frontal burr holes was opened and a Metrizamid ventriculogram was performed. Metrizamid injected through the right lateral ventricle needle did not enter the 3rd or left lateral ventricle. Because of severe headache and vomiting, Metrizamid was not injected into the left ventricle. CT examination showed that Metrizamid entered the right lateral ventricle but not the 3rd and left lateral ventricles (Fig. 1 CD). Right and left carotid angiography was normal. Ventricular catheters were inserted into the right and left lateral ventricles and connected to a medium pressure valve using a "T" connectror. The postoperative course of the patient was uneventful and he became asymptomatic. Repeat CT scans after shunting showed gradually decreasing ventricular size. After the operation Magnetic Resonance Imaging (MRI) was possible. It showed no mass lesion in or around the 3rd ventricle and the size of the ventricles was normal (Fig. 2).

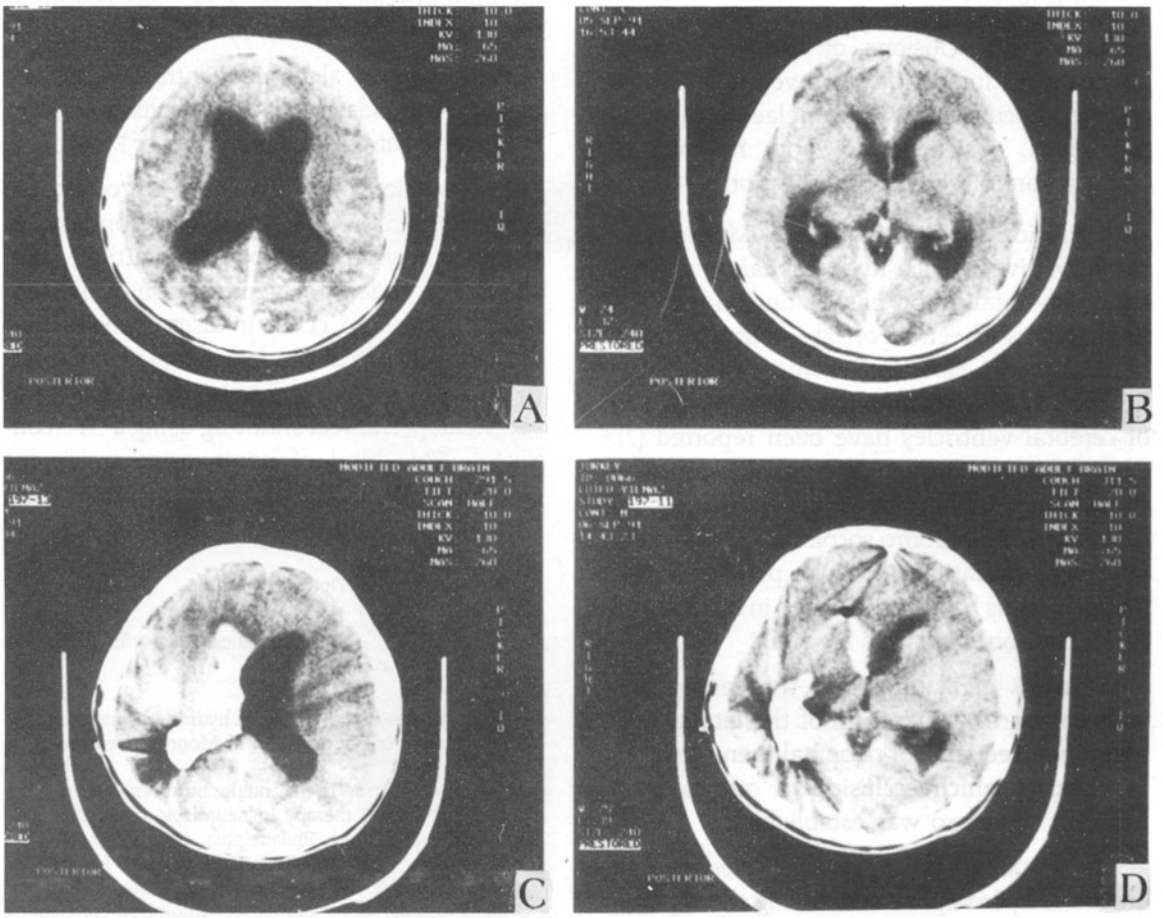

Fig. 1 : A) CT showing dilatation of both lateral ventricles; B) slit 3rd ventricle. There is no neoplastic abnormality around or in the 3rd ventricle; C) and D) filling of the right lateral ventricle by Metrizamid. There is no Metrizamid in the 3rd or left lateral ventricle.

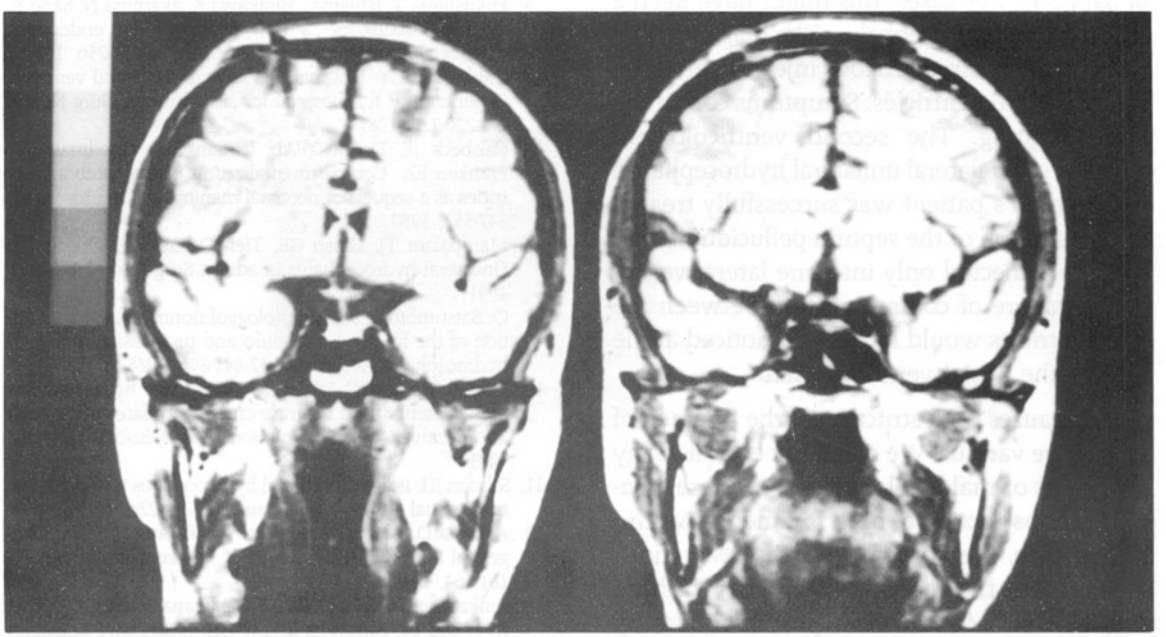

Fig. 2. Postoperative MRI showing normal 3rd ventricle and shunting-induced parinchymal changes.

DISCUSSION:

Although occlusions of the foramen of Monro, aquaduct, and fourth ventricle outlets are well documented as sequelae of bacterial meningitis, obstruction of both foramen of Monro is an infrequent complication (1-4,6,13).

Occlusion of both foramen of Monro with resultant biventricular hydrocephalus, without compartmentalization has, to our knowledge, not previously been reported as a complication of meningitis. However, some biventricular hydrocephalus cases with compartmentalization of cerebral ventricles have been reported (7). Our patient had no compartmentalization. The cause of his hydrocephalus was an occlusion of both foramen of Monro socondary to postmeningitis inflammation. Although postmeningitic hydrocephalus has been reported in infancy and childhood, our case was an adult.

Kalsbeck et al., reported thirteen infants with compartmentalization of the lateral ventricles as a sequelae of neonatal meningitis (7), in eight of which occlusion of one or both foramen of Monro was established.

On the other hand, Salmon reported isolated unilateral hydrocephalus following shunt placement in five infants (11). Because of lack communication between the two ventricles in one of Salmon's five cases, this might have been a biventricular hydrocephalus. The diagnosis had been made by simultaneous injection of air into both lateral ventricles. Symptoms continued after shunting. The second ventriculogram revealed contralateral unilateral hydrocephalus. The Salmon's patient was successfully treated by fenestration of the septum pellucidum. If air had been injected only into one lateral ventricle the failure of communication between the two ventricles would have been noticed at the time of the initial ventriculogram.

The causes of obstruction of the foramen of Monro are various. We could not establish any neoplastic or maldevelopmental cause responsible for obstruction of both foramen of Monro in our case. Neuroradiological investigations showed that the cause of obstruction of both foramen of Monro was postinflammatory changes secondary to meningitis. Review of the literature revealed that only the first of Salmons five cases seemed to be like ours.

Wilberger et al., used ventriculoscopy for diagnosis of unilateral hydrocephalus secondary to congenital atresia of the foramen of Monro (14).

Obstruction of foramen of Monro because of postinflammatory changes secondary to meninigitis was treated by many authors with surgical or endoscopic fenestration of the septum pellucidum (5,11,14). In cases of obstruction of both foramen of Monro, the choice of treatment of biventricular hydrocephalus is bilateral ventriculoperitoneal shunting using a "T" connector. This kind of noninvasive treatment guarantees drainage of cerebrospinal fluid without any complication.

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