

SHORT REPORT

Thecoperitoneal shunt for post-traumatic syringomyelia

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Abstract

A case of post-traumatic syringomyelia developing two years after spinal cord injury is presented. The patient was treated with the placement of a thecoperitoneal shunt incorporating a low pressure valve. Response was excellent with restoration of neurological function and almost complete collapse of the cavity at one year follow up. The rationale of this form of treatment is discussed in the light of recent evidence concerning the pathogenesis of the condition.

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Progressive neurological deficit due to the development of a cavity within the spinal cord months or years after trauma and involving several neurotomes above the site of the injury is a rare but well documented phenomenon.¹ Treatment of the condition is surgical and may include policies directed at drainage of the syrinx via a shunt.^{2,3} By its nature this involves trauma to the already compromised spinal cord and is therefore potentially detrimental to the patient with incomplete cord deficit.

We have recently had the opportunity to study and treat a patient who developed a progressive spastic tetraparesis due to syringomyelia two years after trauma to his cervical spine.

Case report

The patient, a 32-year-old man, presented with a three month history of progressive spastic tetraparesis, more pronounced on the right side, in association with numbness and altered sensation in both arms, more pronounced on the right side. During the preceding two weeks he had also been troubled by attacks of hiccups. Two years before admission, he had been involved in a road traffic accident and had sustained an injury to his neck with resultant transient quadriplegia lasting for a few days. At that time, MRI showed subluxation of the C6-C7 vertebral bodies with mild contusion of the cervical spinal cord at the corresponding level. The patient underwent a C6-C7 posterior fusion. According to notes regarding his operation no metallic struts or wires were used and the dura was intact. He left hospital without sequelae.

On his present admission, neurological examination showed a grade III weakness of pyramidal distribution of the right-sided limbs and a grade IV weakness of the limbs of the left side. Deep tendon reflexes were pathologically brisk in all four limbs. There was hypoaesthesia to pinprick and light touch on the left side in association with reduced appreciation of temperature in the right arm. Studies of the cervical spine by MRI revealed the presence of a large syrinx extending from the C6-C7 level upwards well into the medulla (fig).

Prompted by a recent report⁴ we decided to treat the patient with the placement of a thecoperitoneal shunt in an attempt to restore the disturbed CSF dynamics by bypassing the area of the previous cord injury and also avoiding trauma to the cord. This option was discussed with the patient and his relations and they consented to the proposed treatment without reservations. Under general anaesthesia with isoflurane and fentanyl and continuous intravenous vecuronium the patient was placed on his left side with his head and thorax slightly raised. A small

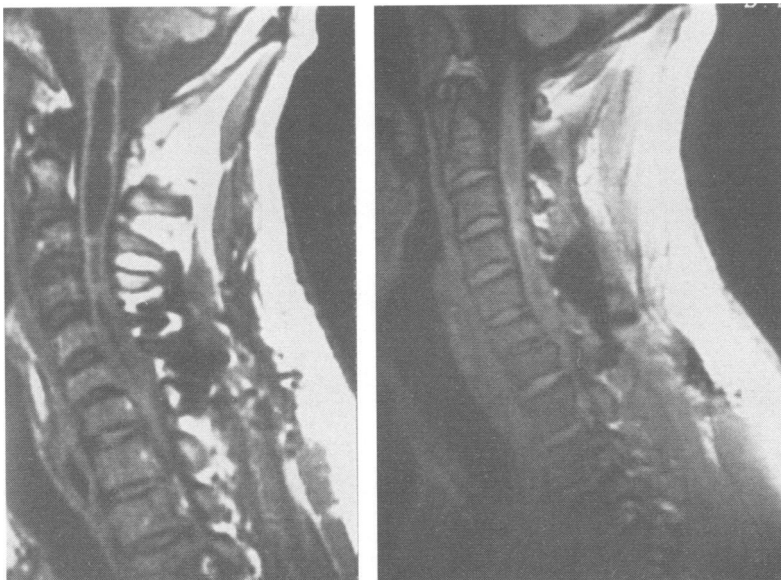


Figure MRI of cervical spine. Left: study performed on admission showing a large syrinx of the cervical cord extending into the medulla; right: study performed at one year showing almost complete collapse of the syrinx.

C4-C5 hemilaminectomy was performed and a subcutaneous cervicoperitoneal shunt using the tubing of a standard Codman system incorporating a low pressure Holter valve (Codman and Shurtleff Inc, Randolph, MA, USA) was placed. On opening the cervical dura the CSF pressure was found to be raised (420 mm H₂O). The thecal end of the system was advanced in the subarachnoid space for a length of 6 cm and the system was connected. The dura was closed tightly in the usual manner. Postoperatively the patient complained of positional headache while erect, which persisted for about 10 days and subsided spontaneously. His symptoms, including the hiccups, resolved in a period of two weeks and the power of his limbs returned to normal. His neurological examination, four months after the operation, was within normal limits. Postoperative MRI showed a substantial reduction in the size of the cervical syrinx. Repeat study at one year showed almost complete collapse of the syrinx and no evidence of descent of the cerebellar tonsils (fig).

Discussion

It is now becoming widely accepted that the pathogenesis of post-traumatic syringomyelia involves at least two mechanisms⁵: Firstly, the disturbance of dynamics at the site of the injury where the CSF starts entering the cord and, secondly, maintenance of movement of the fluid from the subarachnoid space to the damaged cord along the perivascular spaces of Virchow-Robin as proposed by Ball and Dayan⁶ and later endorsed by Aboulker.⁷ The subsequent enlargement of the cavity is, according to Williams,⁸ due to impulsive movements of the fluid caused by the dura in response to venous distension after increases in intrathoracic and intra-abdominal pressure.

In our patient we attempted to modify the disturbed CSF dynamics probably resulting from the previous trauma of the cord and subsequent arachnoiditis, by a diverting procedure. The idea was to reduce the CSF pressure, which was raised probably because of the obstruction of its flow towards the lumbar sac, thereby encouraging reverse of the flow from the cord cavity to the subarachnoid space, to the peritoneal cavity and, at the same time, avoid trauma to the already compromised cord. The immediate clinical response of the patient to the procedure and the MRI evidence of the collapse of the syrinx indicate its effectiveness in this patient with post-traumatic syringomyelia.

In view of the recent evidence that the cervicoperitoneal shunting is effective in cases of syringomyelia presenting with progressive myelopathy,^{4,9} we suggest that this minor procedure should be tried in more cases of post-traumatic syringomyelia so that its exact place in the management of the condition can be defined.

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