Outcome of Surgical Management of Patients with Split Cord Malformation Associated with Myelomeningocele

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Introduction

It is now obvious that Split cord malformation (SCM) is not merely an entity of occult dysraphism; it may coexist with open spinal dysraphism, like myelomeningocele (composite or complex spina bifida) in significant number of cases. The goal of our study is to assess the outcome of surgical management of split cord malformations associated with myelomeningocele and to describe the tethering factors detected during surgery with surgical removal of those factors

Methods

A total of 14 patients treated at Suez Canal University were found to have both SCM and MMC in the period between 2004 and 2008. They were operated for both pathologies simultaneously. They were followed by clinical examination, and had a radiological assessment by thin cuts CT scans and MRI studies

Results

We observed high incidence of split cord malformations occurred in patients with open spina bifida (12%). All patients presented for the open spinal defect, but the SCM appeared in the routine MRI done for all patients.

All the meningocele and myelomeningocele sacs were intact. Preoperative MRI and thin cuts CT scans revealed type I SCM in 11 patients; they had bony spurs separating the cord into two divisions with two separated dural sleeves. The type II SCM was identified in 3 patients only in whom just a fibrous band was the dividing element. The site SCM was always related to the myelomeningocele sac; in 9 patients, the splitting was just rostral to the sac which was lumbar and lumbosacral, while in the other 5 patients a dorsal SCM with overlying meningocele was found. Hydrosyrinx rostral to the area of splitting was found in 5 patients. Hydrocephalus was found in 6 patients (2 patients detected preoperatively, and 4 patients developed within 2 weeks after surgery). Follow-up within first month after surgery revealed that most patients with preoperative motor weakness showed good outcome regarding the motor power. Thirteen of the 14 patients (93%) experienced stabilization or improvement in their neurological function within the first month ($P<0.05$)

Two patients had CSF leak which ceased spontaneously with lying down. After a mean of 18 months follow-up: No patients with preoperative intact neurological examination had shown worsening of the motor power or sphincter control. All the patients with preoperative motor deficit had significant improvement of the deficit. Eleven patients with preoperative severe motor power deficit (grade 0-1) have shown significant improvement of the motor power ($P=0.023$), with movement against gravity or higher grade in all joints. Urodynamic studies revealed stabilization of the neurological bladder function.

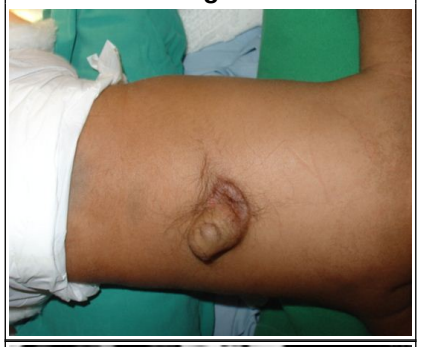
Conclusions

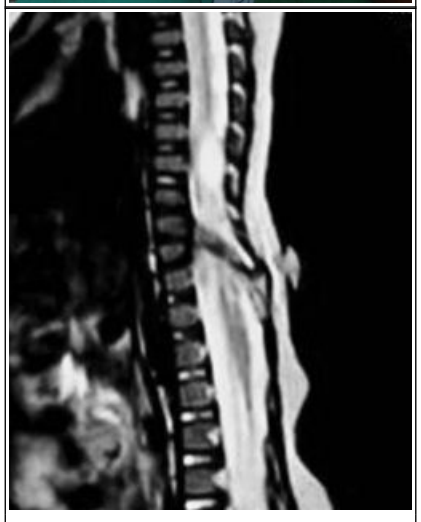
Early surgical management of combined split cord malformation with myelo-meningocele provide a good results if managed adequately with removal of all tethering factors

Learning Objectives

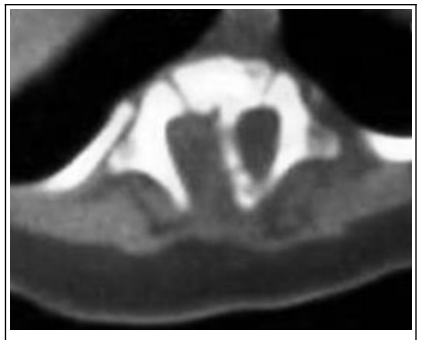
By the conclusion of this session, participants should be able to: 1) Understand the most common causes of cord tethering in this group of patients, 2) Discuss, in small groups,how to untether cord in complex spina bifida

A 2 months old girl with dorsal meningocele overlying a split cord malformation, with surrounding tuft of hair

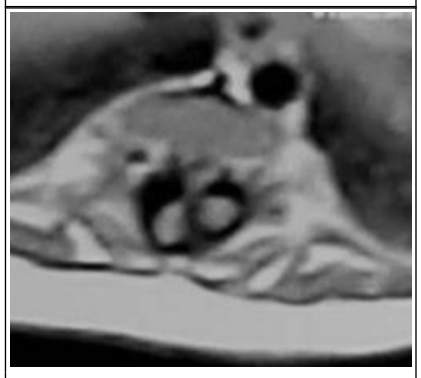




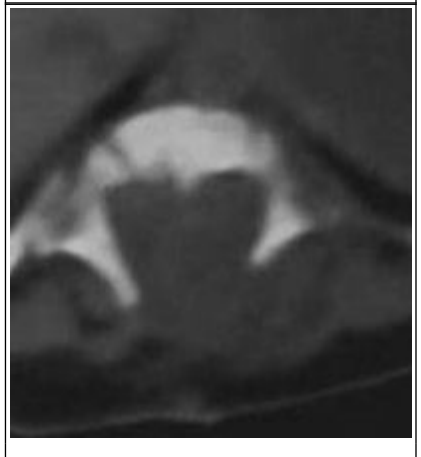
MRI of the same girl demonstrating bony spur extending posterioly and caudally



(A) Preoperative Bone window of axial CT scan demonstrating split cord malformation type 1



(B) Axial cut MRI study of the same patient demonstrating the two hemi-cords



(C) Postoperative axial cut CT scan (bone window) showing adequate excision of the bony spur