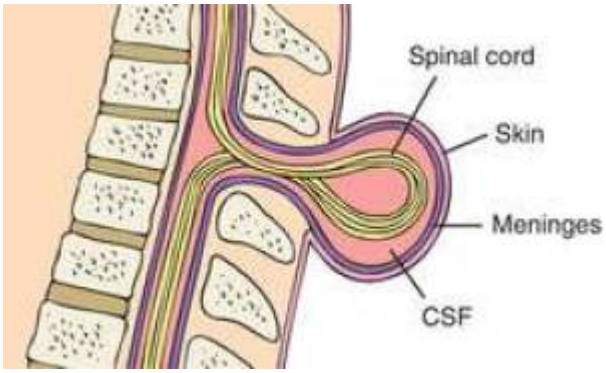
Myelomeningocele complications



Late problems/issues

1. hydrocephalus: may mimic ≈ anything listed below. ALWAYS RULE OUT SHUNT MALFUNCTION when an MM patient deteriorates

2. syringomyelia (and/or syringobulbia)

3. Tethered cord syndrome as many as 70% of MM patients have a tethered cord radio- graphically (some quote 10–20%), but only a minority are symptomatic. Unfortunately, there is no good test to check for symptomatic retethering (SSEPs may deteriorate, myelography may help) a) scoliosis:early untethering of cord may improve scoliosis;

b) symptomatic tethering may manifest as delayed neurological deterioration

4. dermoid tumor at the MM site: incidence ≈ 16%

5. medullary compression at foramen magnum, see symptomatic Chiari II malformation

6. use of growth hormone to increase stature is controversial

---

Associated problems include poor ability to walk, problems with bladder or bowel control, hydrocephalus, a tethered spinal cord, and latex allergy.

Closure of a myelomeningocele is a deceptively simple operation; however, attention to several subtle details can significantly reduce operative complications. Important preoperative concerns include social issues of dealing with a distraught and often overwhelmed family, the timing of surgery, and assessment of associated severe or life-threatening malformations. Operative intervention should be directed toward preserving neurological function and optimizing the subsequent repair of a tethered spine should this become necessary. Careful attention to the vascular supply to the placode, precise separation of neural from cutaneous tissues, a diligent search for associated tethering anomalies such as diastematomyelia and a thickened filum terminale, careful pia to pia reconstruction of the placode, and simple but meticulous wound closure all help in achieving these aims. The timely management of associated hydrocephalus will help to avoid Cerebrospinal fluid fistula and wound dehiscence. Close attention to these details will ameliorate many of the immediate and delayed complications of

myelomeningocele closure [1].

Patients with Myelomeningocele (MMC) have multiple risk factors for venous thrombosis, but this complication rarely occurs. This lower rate of venous thrombosis in MMC children could be related to some characteristics of the vessels in the lower extremities. A study of Salari et al. aimed at finding explanations for this dilemma.

A case control study was designed in the Children's Hospital Medical Center Tehran considering paraplegia patients with MMC as the case group and nonparaplegic MMC patients as a control group. Doppler ultrasound was performed to evaluate femoral artery and popliteal artery and venous properties.

Patients aged from 8 months to 12 years were evaluated. The mean diameter of the femoral arteries was 3.73 ± 0.23 and 4.72 ± 0.39 mm among paraplegic and nonparaplegic MMC patients, respectively ($p = 0.02$). The femoral artery flow was 0.52 ± 0.08 and 0.75 ± 0.06 L/min, respectively in the case and control groups ($p = 0.015$). The diameters of the femoral veins were 4.85 ± 0.34 and 5.13 ± 0.32 mm in the case and control groups, respectively ($p > 0.05$). Besides, the blood flows of the case and control groups' femoral veins were 0.27 ± 0.08 and 0.14 ± 0.01 L/min, respectively ($p = 0.6$). It turned out that lower extremities' arteries in the case group had significantly lower blood flow and diameter compared to those of the control group. However, the same venous properties did not show any significant differences.

The decreased arterial flow along with the unchanged venous properties leads to less stasis and better drainage of the blood, which in turn might result in a lower incidence of Deep-Vein Thrombosis [2].

Tethered cord syndrome as many as 70 % of Myelomeningocele (MM) patients have a tethered cord radiographically (some quote 10–20%), but only a minority are symptomatic. Unfortunately there is no good test to check for symptomatic retethering (SSEPs may deteriorate, [3] myelography may help)

Hydrocephalus develops in up to 80-90% of children with myelomeningocele (MM) after closure of the defect.

Traditionally, ventriculoperitoneal shunts have been used to manage hydrocephalus in these patients. A role for endoscopic third ventriculostomy (ETV) in MM has provoked much debate, principally due to anatomical variants described, which may complicate the procedure.

Perez da Rosa et al. present 7 cases of children with MM and hydrocephalus undergoing a total of 10 ETV procedures. All patients demonstrated clinical improvement (in acute/subacute cases) or stabilization (in chronic cases). Three patients requiring a second ETV have shown clinical stability and renewed radiological evidence of functioning ventriculostomies in follow-up since reintervention. ETV can be used, albeit cautiously, in selected cases of hydrocephalus associated with MM. However, the frequency with which anatomical variation is encountered and the difficulty of the assessment of success make the procedure more challenging than usual [4].

References

1)
McLone DG, Dias MS. Complications of myelomeningocele closure. Pediatr Neurosurg. 1991-1992;17(5):267-73. PubMed PMID: 1822692.
2)
Salari F, Golpayegani M, Habibi Z, Yaghoubi S, Anbarlouei M, Mehdizadeh M, Nejat F. Evaluation of Lower Extremities' Vascular Characteristics in Myelomeningocele Patients: A Case-Control Study. Pediatr Neurosurg. 2019 Sep 5:1-5. doi: 10.1159/000502403. [Epub ahead of print] PubMed PMID: 31487737.
3)
Larson SJ, Sances A, Christenson PC. Evoked Somatosensory Potentials in Man. Arch Neurol. 1966; 15:88–93
4)
Perez da Rosa S, Millward CP, Chiappa V, Martinez de Leon M, Ibáñez Botella G, Ros López B. Endoscopic Third Ventriculostomy in Children with Myelomeningocele: A Case Series. Pediatr Neurosurg. 2015;50(3):113-8. doi: 10.1159/000381747. Epub 2015 May 27. PubMed PMID: 26021675.