

## Repair of Myelomeningocele: How I do it

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**Abstract:** Myelomeningocele is the most common birth defect involving the spine. Its incidence is approximately 1 case per 1000 live births in the United States; in Colombia its incidence is unknown. The primary goal of this article is to present a brief description of the surgical technique used in our hospital for correction of myelomeningocele. All of our patients are operated in the first 6 hours after birth trying to maximize protection and preservation of the exposed neural tissue.

**Keywords:** Neural tube defects, Dysraphism, Spina bifida, Surgical management.

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### INTRODUCTION

Myelomeningocele is the most common birth defect that involves the spine. Its etiology is unknown but there is evidence of genetic and environmental influence [1]. In August 1991 the CDC (Centers for Disease Control and Prevention) recommended the use of folic acid during the periconceptional period. This recommendation was based on a randomized, double-blind, multicenter executed in Europe which clearly demonstrated the protective effect of folates in periconception reducing the recurrence of spina bifida [2, 3].

The Myelomeningocele presumably occurs when the posterior neuropore fails to close or reopens as a result of the relaxation of the central canal of the spinal cord [4]. This abnormality of the spinal cord is only part of a large complex of central nervous system including: hydrocephalus, dysgenesis of the corpus callosum and Chiari malformation Type II. [5].

The MOMS trial has shown that prenatal repair has improved motor function and more and more parents elected to have prenatal repair.

In our hospital, unfortunately the diagnosis most often is too late to allow safe prenatal repair because the mothers come from remote rural areas of town, they have no or inadequate prenatal care and do not consume folic acid. Described above, so the diagnosis is made in the last trimester of pregnancy or at the time of delivery. Also, some parents do (for religious reasons) not want to perform prenatal repair. As such, the postnatal repair needs to be still trained and teaching and knowledge of techniques is important.

Particularly, our young neurosurgeons need to understand our legacy.

### METHODOLOGY

#### Surgical Technique

The goal of surgery is to preserve motor and sensory function. Patients are operated in the first 6 hours of life. They are placed prone with 2 tight rolls: one covering the chest and head which is turned to side and the other roll in the pelvic region being careful to keep the femoral pulses and leaving abdomen freely suspended. The placode is considered a functional tissue, use antibiotics for 7 days after surgery and put ventricular-peritoneal shunt system in all cases is documented ventriculomegaly. I support in cases of tethered cord to unpinit only once.

Asepsis and antisepsis of the operative field is done and samples for cytochemical, cytological and bacteriological studies are done. Circumferential incision of the Myelomeningocele sac is done (Fig. 1A and 1B) with exposing the spinal roots respecting those which penetrate the spinal canal (Fig. 2A and 2B). In the wall of the sac, nerve roots that course back into the spinal canal are mobilized. Some neural elements are atretic and terminate in the sac itself and may be sacrificed. The edges of the neural placode are then folded and sutured with interrupted 6-0 monofilament nylon to restore the configuration of the spinal cord. Within the spinal canal, the filum terminale can often be identified. It should be cut sharply to release the associated tethering of the spinal cord.

The dura is then dissected from the subcutaneous tissue and lumbosacral fascia. A watertight closure is essential (Fig. 3A and 3B) and can

be verified by the anesthesiologist performing a Valsalva maneuver on the patient. I sometimes use autologous patch. The paravertebral muscles and fascia are mobilized to close in the midline, if possible, and to reestablish their proper dorsal position relative to the vertebral elements. I perform muscular closure plane with 3-0 vicryl, face a few points of subcutaneous tissue

and skin closure excising the redundant skin (Fig. 4A). Antibiotics are used for 7 days after surgery. The dressing must remain dry and the wound isolated from feces. Approximately 80% of patients have hydrocephalus so I prefer to put a ventricular-peritoneal shunt system in the same surgical procedure in all cases which it is documented ventriculomegaly.



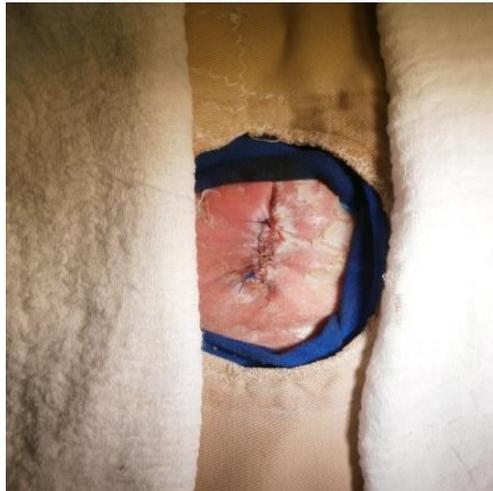
**Fig. 1A and 1B: Lumbosacral myelomeningocele broken and circumferential incision of the dysraphic default.**



**Fig. 2A and 2B: Spinal roots tied to the placode**



**Fig. 3A and 3B: Closure dura**



**Fig. 4A: Surgical wound**

### **Post-operative care and complications**

The primary care in the post-operative is related to the surgical wound; to avoid infection proper hygiene of the perianal region must be taken and in this way the wound contamination is prevented by contiguity. I leave the antibiotics for 1 week and remove points at 2 weeks.

The most common complications that may occur include dehiscence of the surgical wound, cerebrospinal fluid leak, hydrocephalus, tethered cord or motor impairment in lower extremities [6-9].

### **CONCLUSION**

The article consists of a brief description of the surgical technique used in our hospital for correction of myelomeningocele. All the patients are operated in the first 6 hours after birth trying to maximize protection with preservation of the exposed neural tissue.

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