

## Thoracolumbar Myelomeningocele Bursting Primary Repair: Safe Multilayer Secondary Reconstruction Using a Latissimus Dorsi Muscle Flap

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### Abstract

**Study background:** The authors present a case of a giant thoracolumbar myelomeningocele (T9-L5) in a newborn of 39 weeks. The goal of the procedure is to provide an amount of adequate cutaneous subcutaneous tissue, which allows an efficient coverage of the duraplasty, and reduces the risk of infections and the tissue stretching at the same time.

**Methods:** Closure of the defect was achieved using a patch of fascia lata and soft tissues were reconstructed using latissimus dorsi muscular flap and a split thickness skin graft. Primary correction was performed immediately after birth, as a neurosurgical emergency. Few days after surgery, a complete dehiscence of the suture occurred.

**Result:** We outline here a favourable outcome of a giant MMC bursting primary repair, using the LDMF. Follow-up is now at 2 years and local conditions are excellent.

**Conclusion:** The use of Latissimus Dorsi Flap could be considered the first choice for treatment of giant myelomeningocele in newborn. It gives a higher chance of getting immediately the definitive and qualitatively better repair of the defect with reduced risk of local and systemic complications.

**Keywords:** Myelomeningocele; Duraplasty; Spinal defect; Secondary reconstruction; Latissimus Dorsi flap; Skin graft

### Introduction

The main purpose of Myelomeningocele (MMC) correction is to ensure rapid watertight closure of the dura, avoiding liquor leakage (16% of cases), preventing infections, such as meningitis and ventriculitis, that potentially lead to death [1].

Reconstruction is carried out as a neurosurgical emergency, and should be performed by a multidisciplinary team. The goal is to provide an amount of adequate tissue, which allows an efficient coverage of the duraplasty, and reduces the tissue stretching at the same time [2].

Most of the procedures for MMC repair are complicated by dehiscence of the flaps or vascular distress, seromas, haematomas, pseudo-meningocele [3] and infections, which may be lethal for the young patient.

We outline here a favourable outcome of a giant MMC bursting primary repair, using the Latissimus Dorsi Muscle Flap (LDMF).

### Materials and Methods

Female newborn, born at 39 weeks of gestation by cesarean section, due to twin delivery and fetal malformation. Apgar was 1":8 and 5":9, weight at birth 2,850 Kg.

The patient, affected by thoracolumbar myelomeningocele of 90 cm<sup>2</sup> (15×6 cm), was referred to the Emergency and admitted in the

Pediatric Intensive Care Unit, intubated and sedated immediately after birth. MRI revealed thoracolumbar myelomeningocele (T5-T10).

A Chiari II malformation, triventricular hydrocephalus and agenesis of the left kidney were associated to the defect. The newborn was promptly operated by the neurosurgical team.

The placode and the dorsal, lumbar and caudal roots were isolated; skin closure was initially obtained by approximation of the cleft margins towards the midline. Sixteen days after surgery, an external ventricular derivation was positioned and the partial cutaneous dehiscence of the myelomeningocele repair was sutured again on the midline.

In the following 2 weeks a complete dehiscence with partial necrosis of the wound and cerebrospinal fluid leak were evident (Figure 1); therefore, the patient was once again operated by a multidisciplinary team (plastic and neurosurgeons).

### Results

The meningeal canal spine at T10 level (1,5×1 cm) was closed using a patch of fascia lata taken from the left thigh and the soft tissues (10×5 cm) were reconstructed using the left LDMF, transposed on its primary pedicle (Figure 2).

A single Jackson-Pratt drain was positioned in the left axilla. The patient was kept in prone position, intubated and curarized for 7 days. The postoperative period was uneventful, drain was removed 4 days after surgery and stitches after 2 weeks. Follow-up is now at 2 years and local conditions are excellent (Figure 4).



Figure 1: Fascia lata graft taken from the left thigh



Figure 2: Preparing LD flap on its main pedicle of thoracodorsal artery

A definitive coverage was obtained by split-thickness skin grafts taken from both buttocks (Figure 3).



Figure 3: Final skin coverage using cutaneous thin grafts taken from the buttocks



Figure 4: Follow-up at 20 days postoperative

## Discussion

Several reconstructive procedures in literature are described, such as local skin flaps, expanded skin flaps, muscular and muscular-aponeurotic flaps, used in combination with skin grafts and even alloplastic materials [4].

Direct approximation of the cleft margins for minor defects (<18 cm<sup>2</sup>) is described, as through careful dissection and advancement of the adjacent tissues, as using cutaneous and fasciocutaneous local flaps (double Z-plasty, V-Y advancement, rhomboid etc.) [4].

Wide defects (>18 cm<sup>2</sup>), need muscular or myofasciocutaneous pedicled flaps [5].

The Latissimus Dorsi Muscular Flap (LDMF) is the best choice to cover large defects from T1 to L5 because of its wide arc of rotation and great versatility. The muscular tissue fit and seal the flap over the duraplasty, reducing fistulas onset [2]. It can be also used as a reverse, as on secondary pedicles alone. After extensive dissection, the suction drain is mandatory to prevent blood serum collections that would increase the risk of infection and would weaken the duraplasty seal [6].

The chance of survival increases, if an early watertight duraplasty and a definitive coverage with a myocutaneous unit is performed [7].

The benefits of the use of muscular or myocutaneous flaps compared to other reconstructive methods such as grafts, local flaps, amniotic membranes and alloplastic materials, are related to the higher chances of getting immediately the definitive and qualitatively better repair.

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