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## Case Report

# Repair of myelomeningocele using autologous amnion graft and local flaps. A report of two cases<sup>☆</sup>

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## ABSTRACT

We describe two cases where autologous amnion grafts were used to cover the neurosurgical repair of myelomeningocele (MMC) and the reconstructive flaps used for the skin defects.

MMC is a severe fetal defect that evolves during embryonic development as a result of the neural tubes failure to close. In post-natal MMC closure, early timing of surgical repair is essential.

We found that a free amnion graft is a viable choice in reconstructive surgery for myelomeningocele and that a multidisciplinary surgical team involving obstetrician, neurosurgeon and plastic surgeon is essential.

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## Introduction

Myelomeningocele (MMC) is a severe fetal defect that evolves during embryonic development as a result of the neural tubes failure to close.<sup>1</sup> When deciding on postnatal MMC closure, timing of the surgical repair is essential in preventing infection and further trauma to the exposed neurological components.<sup>2</sup>

This case report describes the post-natal surgical treatment of two MMC using amnion grafts to cover the neurosurgical repair. A number of metabolic properties have been demonstrated in amnion grafts after transplantation including growth factor promoting epithelialization and inhibiting fibrosis and scarring as well as anti-inflammatory and anti-bacterial effects.<sup>3,4</sup> Reviewing the current literature, this technique has only been described twice before in the literature.

## Case 1

A girl was diagnosed prenatally by ultrasonography at 20 weeks of gestation with a lumbosacral MMC and hydrocephalus.

Elective cesarean section was performed at 38+1 weeks of gestation. At delivery, the cele had ruptured, leaking spinal fluid. The placenta and membranes were subsequently removed from the uterus as gentle and sterile as possible, and placed in a sterile environment. The amnion was gently separated from the chorion, wrapped in sterile gauzes and stored in a bicarbonate-buffered culture medium, designed for use in vitro fertilization procedures for culture of embryos at +4 degrees Celsius until surgery, [Figure 1](#).

The following morning, the repair of the MMC was performed under general anesthesia in a multidisciplinary setting, with neuro- and plastic surgeons. Initially, a ventriculo-peritoneal shunt was inserted, then a layered closure was performed of the MMC. Under microscopic magnification the neural placode was carefully dissected and sutured; after this, dural remnants were released and sutured together and dysplastic meninges were excised.

The autologous amniotic membrane graft was draped over the sutured dura defect and fastened with resorbable sutures, [Figure 2](#). A thoracolumbar fascial flap from each side was positioned over the repair. Next, a fasciocutaneous local flap, designed as a Limberg flap, was harvested and transposed into the defect. The wound edges were closed at fascial and skin levels, [Figure 3](#).



**Figure 1.** The separation of amnion and chorion.

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