A Novel Skin and Fascia Opening for Subfascial Inserting of Intrathecal Baclofen Pump

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OBJECTIVE: **The aim of this article is to introduce a new skin and fascia opening for intrathecal baclofen pump implantation in the abdomen, with the purpose of reducing complications related to wound breakdown.**

METHODS: **We introduce a novel way of cutaneous and fascial opening that leads two opposed "L shaped" incisions.**

RESULTS: **This method entails numerous advantages. The first advantage is avoiding the direct alignment of overlapped sutures, which creates a locus minoris resistentiae that can weaken and break under the push of the pump. Another advantage consists of an increased obstruction against deep extension of infective processes from cutaneous origin. The wide opening of the subfascial pocket permits the implantation of any type of pump available, and it reduces complexities in reopening the pouch for pump replacement. It also permits the fastening of all anchoring systems usually present in pumps. Another advantage is the improved possibility of careful muscle cauterization thanks to the wide fascia opening, with reduced risk of postsurgical hematoma. Our results showed a reduction of wound complications with this method.**

CONCLUSIONS: **This method could contribute to reducing the rate of wound complications and patient discomfort.**

INTRODUCTION

Intrathecal baclofen therapy, first described in 1984 by Penn and Kroin[1] for the treatment of spinal cord origin spasticity, provides continuous delivery of baclofen directly to the pharmacologic site of action in the spinal cord. Since the advent of the procedure in 1985,[2] intrathecal baclofen pump implantation techniques have markedly changed. Initially, the standard surgical procedure involved the pump implantation in the in the subcutaneous plane of the lateral abdominal wall; however, this technique was associated with poor healing, wound dehiscence, and wound or pump infection.[3-7]

In 1998, Grabb and Pittman originally described a subfascial technique of inserting the pump. This method was subsequently implemented and illustrated by Kopell et al.[8] with the purpose of demonstrating its potential in reducing complication rates.

In 2006, Albright et al.[9] presented the techniques for optimal pump and catheter implantation, including subfascial pump placement. He described a cutaneous opening practicing a slightly oblique incision approximately one fingerbreadth below the right costal margin, with the lateral extent of the incision in line with the anterior superior iliac spine. The subcutaneous tissue and fascia were opened following the same shape, using needle-tip cautery. He proposed a fascia opening between the external oblique muscle laterally and the rectus abdominis muscle medially, and a fascia dissection from the 2 muscles to create a subfascial pocket, using the cautery tip to separate the fascia from the underlying muscle.

This technique reduced the risk of skin dehiscence providing more soft tissue coverage of the pump, and improved the cosmetic appearance of the abdomen by reducing the pump profile in significantly underweight children. In addition, a reduction in the infection rate was registered using Albright's technique.[10,11]

Key words
- Baclofen pump
- Incision
- Pump implantation
- Spasticity
- Subfascial pump

Abbreviations and Acronyms
BMI: Body mass index

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Despite the recognized improvements of the implantation technique, the complication rate is still not negligible. In the management of spasticity, it is important to define the risks and complications of the treatment to allow development of a risk–benefit ratio. Several complications are still reported in literature, such as wound dehiscences, CSF leaks, and catheter-related problems and infections.

The aim of this article is to propose a new skin and fascia opening with the purpose of reducing the complications related to wound breakdown.

TECHNIQUE

The patient is positioned in the lateral decubitus position on the operative table, with the left side down. The skin and subcutaneous tissue incision is performed following an inverted "L" shape (Figure 1).

The skin incision starts approximately one fingerbreadth below the right costal margin, with the lateral extent of the incision in line with the anterior superior iliac spine, on the lateral side of the rectus abdominis muscle, and it continues horizontally and medially to reach the intersection with the ipsilateral lateral sternal line. From this point, the incision deviates inferiorly with a gentle curvature to terminate at the intersection with the transiliac line (Figure 2).

The outline of fascia opening is reverse respect the skin (Figure 3), to avoid overlapping its interruption with the wound of upper layer and creating consequently a *locus minoris resistetiae* that could breakdown under the traction of the pump. Another advantage is an increased block against deep extension of infective processes from cutaneous origin.

The fascia is opened in proximity of the rectus abdominis muscle aponeurosis in line with the anterior superior iliac spine. The incision extends vertically approximately one fingerbreadth

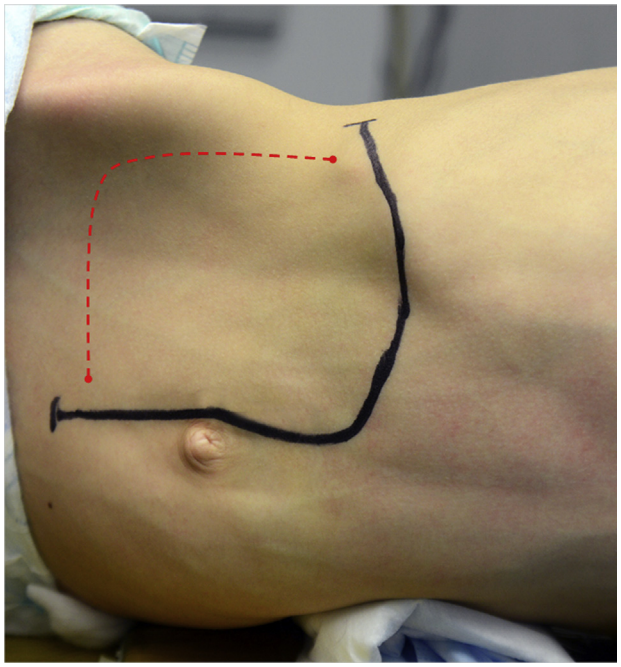

Figure 1. The patient is positioned in lateral decubitus position on the operative table, with the left side down. The skin and subcutaneous tissue incision is performed following an inverted "L" shape (*blue line*). The outline of fascia opening is reverse respect the skin (*dotted red line*).

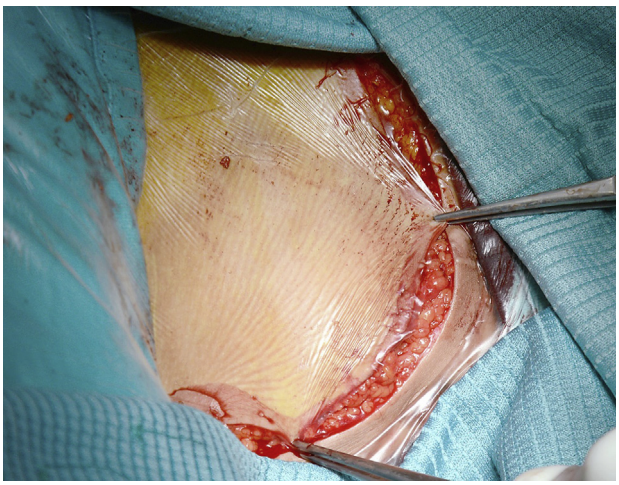

Figure 2. The skin incision starts approximately one fingerbreadth below the right costal margin with the lateral extent of the incision in line with the anterior superior iliac spine, and it continues horizontally and medially to reach the intersection with the ipsilateral lateral sternal line. From this point, it deviates inferiorly with a gentle curvature to terminate at the intersection with the transiliac line.

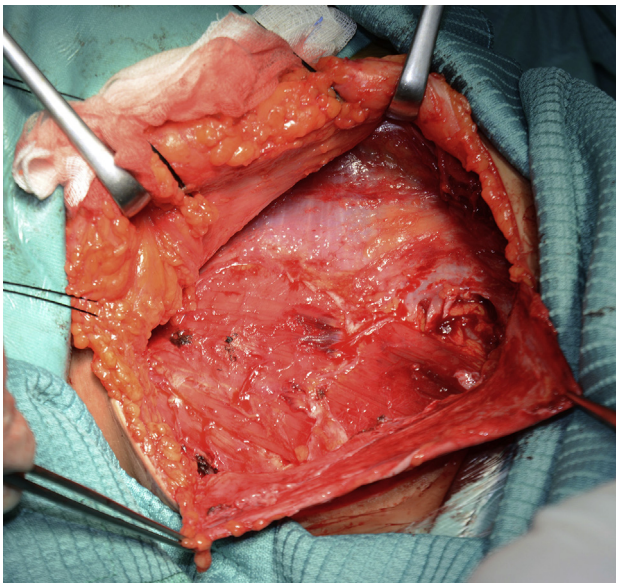

Figure 3. The outline of fascia opening is reverse respect the skin.