Clinical notes

Subfascial expansive plasty for intrathecal baclofen pump replacement. A technical note

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Purpose: Although intrathecal pump replacement is a common technique, it can be sometimes complicated when aiming to replace a 20 ml pump with a bigger one (40 ml). We developed a simple and straightforward technique to relax the wall of the pocket of the pump, preserving its fascial layer.

Methods: A 20-year-old boy with spastic tetraparesia was admitted for pump replacement. After scar opening and pump removal, various lineal incisions were performed in the posterior layer of the subfascial pocket in a cranio-caudal direction.

Results: A 40 ml pump was placed without skin incision ampliation and preserving subfascial plane.

Conclusions: This easy, expansive technique for infusion pump replacement preserves subfascial plane and prevents the need for more extensive surgeries.

Keywords: Intrathecal injection, Baclofen, Muscle spasticity

Introduction

Advances in global care have produced an increasing life expectancy and quality for patients with spasticity disorders like dystonia or cerebral palsy.^{1,2} Many of these patients are treated with intrathecal baclofen (ITB) for many years. ITB reservoirs have a limited life span and must be replaced every 5 to 10 years. In selected cases it is possible to insert a 40 ml ITB reservoir, which needs refills less frequently, but necessitates larger subfascial pockets, which is of particular concern for spastic patients given their small subcutaneous spaces and abdominal walls. We report our experience with a simple technique that allows replacement of a 20 ml with a 40 ml ITB reservoir without bigger skin or fascial incisions. The same technique has also been used in 20 ml-to-20 ml ITB reservoir replacement.

In the past year five ITB reservoirs have been replaced without complications and very easily. Herein we include a demonstrative case and describe the technique.

Clinical case

A 20-year-old male presented with Pelizaeus-Merzbacher demyelinating disease with spastic

tetraparesia. Baclofen-morphine intrathecal infusion had been started seven years before, with satisfactory control of spasticity (Modified Ashworth scale 2/4³). The patient was admitted for pump replacement due to imminent battery expiration. Considering that the patient was in good condition but needed high dosage and short time re-filling, we decided to replace his 20 ml infusion pump with a bigger, 40 ml system (Medtronic Synchromed II).

Technical note description

On the operative table the prior abdominal scar is re-opened. All ITB reservoirs at our department are implanted subfascially, following literature suggestions,⁴ because in our opinion this prevents extrusion or infection of the device and makes second surgeries easier. Soft tissue is dissected and previously sutured anterior fascia is identified and opened in a parallel fashion to the skin incision. Care has to be taken in opening fascia as cranially as possible, thus after closure the majority of the mechanism will be allocated caudally to the suture line minimizing the risk of decubitus or extrusion.

The pump is identified, disconnected and carefully extirpated with special care to minimize the risk of mobilization of the infusion catheter. In most cases,

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Figure 1 Intrathecal baclofen pocket remodelling. The pointed lines show the perpendicular incisions on the posterior wall of the pocket. The arrow shows the direction of the fascial expansion. The cross shows the catheter's loops, which have to be carefully preserved during the procedure. The star indicates the superficial abdominalis fascia.

especially in systems that had been implanted many years before, the subfascial reservoir develops a fibrotic and thickened cover that is much less elastic than the normal tissues of a patient that is operated on the first time. This inelastic covering makes the insertion of a new infusion pump difficult, especially when the surgeon is attempting to introduce a 40 ml reservoir (that has the same diameter but is almost twice in height of a 20 ml pump). Nevertheless even when replacing the reservoir with an identical one, the fibrotic pocket is normally so uncompliant that the new reservoir cannot be placed easily and a bigger skin and fascial incision is needed.

Figure 2 Post-operative X-ray showing correct positioning of the intrathecal baclofen pocket.

Figure 3 Post-operative X-ray showing correct positioning of the intrathecal baclofen pocket.

In order to avoid further caudal dissection and a bigger skin incision or a new pocket, the posterior wall of the bag can be cut in a perpendicular fashion from caudal to cranial with three to five straight lines (Fig. 1). This manoeuvre allows a satisfactory fascial release; it can be realized with a thin blade or dissection scissor, although in our opinion monopolar cautery with “Colorado” tip is a safe and easy to handle tool. Care should be taken to preserve infusion catheter's loops that are normally included in the fibrotic tissue of the bag's posterior wall.

After the infusion pump is replaced, the fascia is tightly closed with absorbable stitches, then soft tissues and skin are closed.

Follow-up

No patients experienced complications in the replacement, and no patient developed any problem at survey. Postoperative X-ray (Figs. 2 and 3) shows the correct position of the pump in the demonstration

Figure 4 Post-operative scar.

Table 1 Clinical features of the patients

Patient	Sex	Age	Disease	Type of reservoir replacement	Complications	Follow-up
1	Male	11	Cerebral Palsy	20 ml–20 ml	No	7 months
2	Male	21	Pelizaeus-Merzbacher dymyelinating disease	20 ml–40 ml	No	9 months
3	Male	16	Cerebral palsy	20 ml–40 ml	No	5 months
4	Male	9	Cerebral palsy	20 ml–20 ml	No	10 months
5	Male	21	Cerebral palsy	20 ml–40 ml	No	4 months

case. The postoperative course was good (Fig. 4), and no extrusion or migration of the pump was found. The five operated patients are summarized in Table 1.

Conclusions

We report a simple and straightforward technique that we found quite helpful when aiming to introduce a bigger ITB reservoir into a small subfascial pocket. Nevertheless, we believe that this technique is also useful when replacing a reservoir with another one with the same volume; the wall of the pocket is thick and thus it may be difficult to introduce a new reservoir even when it is not bigger than the old one. This technical detail allows subfascial positioning, preventing fascial rupture or extensive useless skin incisions.

Disclaimer statements

Contributors GP, MD: first author, manuscript writing and clinical research; GP-P, MD: manuscript writing and clinical research; MR-G, MD, PhD: manuscript

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