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Article

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Pseudomeningocoele after baclofen pump placement in a child: a case report and preventive measures

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Abstract: Intrathecal baclofen therapy is a well-established means of treating intractable spasticity and dystonia in paediatric as well as adult population. Complications of baclofen pump placement include infection, malfunctioning and refraction to baclofen. We report a case of eight year child suffering from spasticity due to cerebral palsy, who developed pseudomeningocoele due to peri-catheter leak. Steps and precaution pertaining to pump implantation in a child are discussed. Baclofen pump insertion in a child needs some extra precautions due to non-availability of pediatric implants and poor built of the pediatric patient to adjust with a bulky device. Preventive measures should be taken to prevent peri-catheter CSF leak.
Key words: Baclofen Pump, CSF Leak, Pseudomeningocoele

Introduction

Intrathecal baclofen (gamma-aminobutyric acid analogue) therapy is a well established means of treating intractable spasticity and dystonia in pediatric as well as adult population. A programmable intrathecal pump provides a direct, pattern-controlled delivery of baclofen to the spinal cord. Complications of baclofen pump placement include infection, malfunctioning and refraction to baclofen. [2] They can occur at the time of implantation and throughout the life of the implanted system. Any complication requiring removal or change of implant can be very expensive. We report a case of pseudomeningocoele after baclofen pump placement in a child and its preventive measures.

Case History

Eight year old female presented with Cerebral Palsy since birth with progressive spasticity in all the limbs. She had severe pain and difficulty in moving the lower limbs. On examination, Grade 4 spasticity was noted in both lower limbs according to modified Asworth's grading system.

Oral Baclofen was tried but was not effective. Intra-thecal instillation of 25 mcg baclofen, patient showed improvement in spasticity. Hence, Baclofen (Tricumed) pump

placement was performed by the standard technique. Drug dose was increased from 25 mcg/ day to 50 mcg/ day on 3rd day. Patient showed significant improvement and physiotherapy was started. Patient came to OPD after 5 days with soft, fluctuant, non-tender swelling at the site of baclofen pump placement. There was no swelling along the track of the tubing or insertion site in the lumbar spine. Her limbs were less spastic than before. Compressive dressing was done, antibiotics escalated and physiotherapy continued. Keeping CSF collection in mind, raised ICP was ruled out by CT scan of brain. Patient again came 4 days later with tense wound bulge which extended along the track of tubing up to lumbar spine (Figure 1). The swelling was tapped with 20 G needle and about 50 ml of clear fluid aspirated. Gross appearance and laboratory examination suggested it to be CSF without any evidence of infection.

Keeping CSF leak in mind, we planned re-exploration under general anaesthesia. First abdominal wound was explored and around 100 ml of clear fluid evacuated. Connection between the catheter and baclofen pump was found to be intact (Figure 2). Then, lumbar wound was explored and around 50 ml CSF evacuated. Active CSF leak around the catheter at the entry point into the Thoraco-lumbar fascia was noted. Fascia was cut, muscles were separated and catheter was traced up to duramater. L2 partial laminectomy was also performed to create space to inspect the entry point into the duramater. Dural leak was noted around the catheter which was due to a long vertical slit in the duramater. Meshed muscle with biological glue was kept over duramater around catheter. Sutures applied over muscle and fascia (purse string sutures) around the catheter. Wound closed in multiple layers with precautions to prevent any kink to the catheter. Post operative period was uneventful and patient was discharged after 2 days. There was no wound bulge or CSF leak after that.

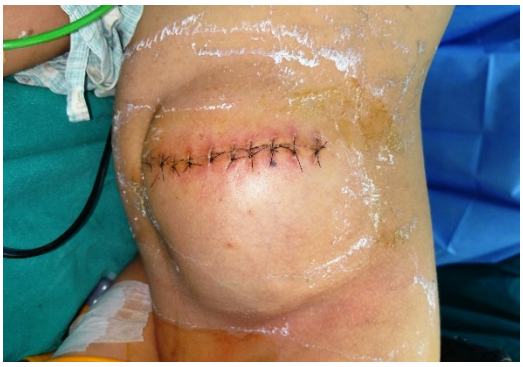

Figure 1 - Swelling in anterior abdominal wall

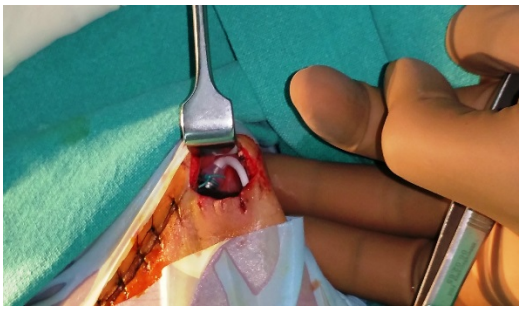

Figure 2 - Connection between catheter and baclofen pump found intact

Discussion

The Intrathecal baclofen pump is surgically implanted in the subcutaneous tissue of anterior abdominal wall. Baclofen is delivered via a silicone rubber catheter into the lumbar subarachanoid space.

Toughy needle (16G) is inserted through the fascia blindly into the thecal sac and catheter is passed through it. Though there is a mismatch in the diameter of needle and catheter, we assume that elasticity and strength of tissue shall grasp the catheter surface tightly to prevent any retrograde peri-catheter leak of CSF.

Still, CSF leak may occur due to following reason:

1. Catheter related problems like dislodgement, migration, fracture, breakage, kinking, occlusion and puncture.

2. Duramater is thin and may get torn with tip of needle

3. If the length of catheter surrounded by tissue is not adequate.

4. Muscles are less bulky and compression force of soft tissue over the catheter is less

5. Disparity in size of puncture needle versus catheter diameter appears to be more significant in a child as sealing property of thin duramater may be less effective.

Such patients may present with drowsiness, nausea, headache, muscle weakness and light-headedness due to CSF leak or increase in spasticity as a result of the pump delivering an incorrect dose of baclofen. [4] In our case, patient responded well initially, but there was CSF collection along the path of baclofen pump and its tubing. We suspected disconnection between catheter and pump; but this was found intact on fluoroscopy and later confirmed on exploration.[3] We did CT scan brain and ruled out hydrocephalous as raised ICP may promote peri-catheteric CSF leak. On exploration, there was pericatheter dural leak which was due to poor muscle bulk, short length of tubing in soft tissue and a large rent in the duramater. While inserting a lumbar intradural catheter, we depend on body's natural mechanism to hold the catheter and prevent a CSF leak. This patient was a thin built female child who was bedridden for a long time; hence the natural mechanism to grip the catheter was deficient.

Cases of seroma and pus collection have been reported in the literature. [1, 2, 5, 6] Initially, we suspected it to be seroma, so just a compressive dressing was applied. We avoided aspiration fearing that it may introduce infection. We aspirated only when it became tense and bulging. It was CSF and infection was ruled out by negative culture examination.

Hence, we recommend some preliminary measures to be taken:

1. The size of the Toughy needle should be smaller for pediatric patients and we recommend that the manufactures' should design smaller needles.

2. Open insertion is not necessary in the adult patients but in children we should dissect up to the duramater and directly insert catheter under vision. We can put biological glue and muscle around the dural puncture site to prevent CSF leak.

3. Strong purse string suture should be applied around the catheter on the fascia.

4. Rule out raised intracranial pressure before pump insertion.

Conclusion

Baclofen pump insertion in a child needs many extra precautions due to non availability of pediatric implants and poor built of the pediatric patients to adjust with a bulky device. Preventive measures should be taken to prevent peri-catheter CSF leak.

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