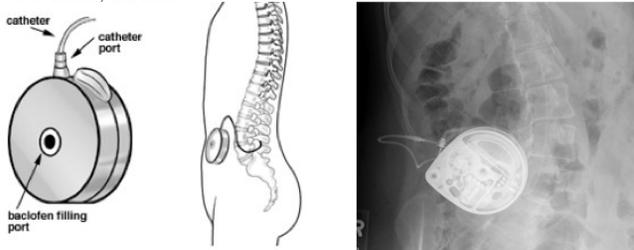


Postsurgical Complications in Patients Undergoing Baclofen Pump Implantation

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Background & Rationale

- Baclofen acts as an agonist of GABA-B receptors within the central nervous system, and therefore has an inhibitory action on muscles.
- Its use as a muscle relaxer makes it a great treatment for muscle spasticity-associated conditions, such as cerebral palsy.
- Intrathecal baclofen (ITB) therapy has been shown to be more effective than oral baclofen in treating spasticity.
- ITB therapy has many potential complications, such as infections, CSF leak, tears and obstructions in the catheter, pump malfunction leading to baclofen withdrawal or overdose, and more.



The **OBJECTIVE** of this study is to review the outcomes and complications from ITB therapy comparing two catheter models in a large case series to improve the knowledge base for performing baclofen pump implantation surgeries.

Project Approach

Patient Demographics

Retrospective Chart Review (n=142)
(patients who had baclofen pump implantations between 2006 and 2019 at Children's Hospital Colorado)
Protocol #: 19-1178

Creation of REDCap Database

CT Dye Study Review

Data Analysis:
Descriptive statistics, Chi Square, Fisher's Exact tests

Diagnosis	Percentage of Patients
Cerebral Palsy	40.8% (n=58)
Traumatic Brain Injury	4.2% (n=6)
Abusive Head Injury	4.9% (n=7)
Spinal Cord Injury	2.8% (n=4)
Hereditary Spastic Paraparesis	1.4% (n=2)
Anoxic Brain Injury	19.0% (n=27)
Brain Malformation	10.6% (n=15)
Other	16.2% (n=23)
Tone Abnormality	Percentage of Patients
Spastic Quadripareisis	43.7% (n=62)
Spastic Diparesis	12.0% (n=17)
Mixed Spasticity / Dystonia	38.7% (n=55)
Myoclonus	1.4% (n=2)
Other	4.2% (n=6)

Results

- 111 patients (78.2%) experienced a complication, with 63 (out of the total 44.4%, with complications 56.8%) requiring a revision for the complication, 15 (total 10.6%, with complications 13.5%) requiring a surgery to correct an infection, 9 (total 6.3%, with complications 8.1%) requiring a blood patch, and 22 (total 15.5%, with complications 19.8%) having the pump permanently explanted.

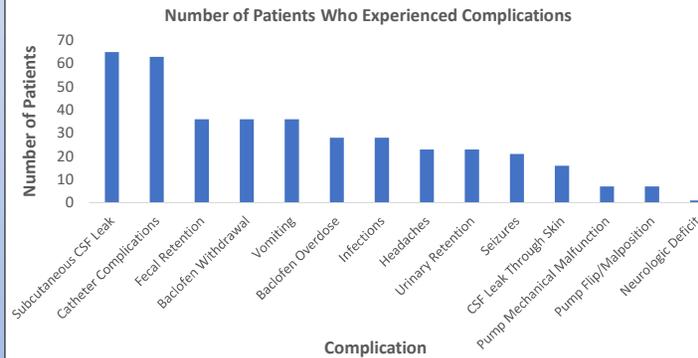


Figure 1: Frequency of complications within database. CSF leak and catheter complications were the most common complication in the patient list. Neurologic deficits were significantly less common than other complications.

Complication Rate by Catheter Type

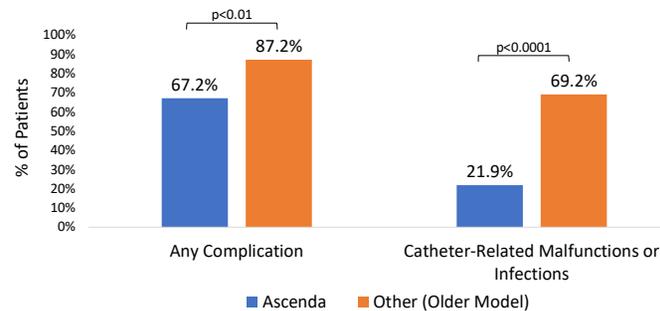


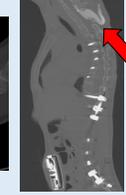
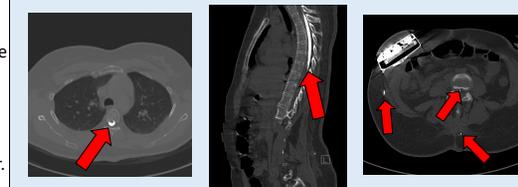
Figure 2: Catheter model versus number of complications. Ascenda catheter was associated with significantly fewer catheter complications than older models.

- Disconnection and obstruction were the most common of the catheter complications, with 18% (n=26) of patients experiencing either complication.

CT Dye Study Characterization

Normal

Hyperdense dye filling the subarachnoid space, indicating a patent catheter.



Pseudomeningocele
Hyperdense extending posteriorly from the spine, indicating CSF leaking around the catheter through the dura.

Epidural

Hyperdense dye is seen outside the dura, rather than filling the subarachnoid space, indicating an errant, epidural catheter.



Conclusions

- CSF leak and catheter complications were the most frequent complication type in patients undergoing baclofen implantation.
 - Neurosurgeons can strive to prevent CSF leak – ensuring good CSF flow after catheter placement, keeping patients flat for several days post-implantation, etc.
 - The Ascenda catheter (the newer model), revealed fewer catheter complications (such as disconnection or tear), than older catheter models.
- Future Directions:** We would like to continue this work by reviewing the baclofen drug withdrawal and overdose complications to find patterns in the dosage of intrathecal baclofen, in order to create a formula rate for the baclofen pumps post-revision.