

Intrathecal Baclofen Pumps: When the Connection Fails Spasticity Prevails

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Introduction

- Intrathecal drug delivery systems (IDDS) have been a remarkable development for the treatment of chronic pain and spasticity refractory to conservative medical management.
- In treating spasticity, intrathecal baclofen pumps can provide adult and pediatric patients with substantial relief leading to improved functional outcomes and reduced exposure to sedating systemic antispasmodic medications.
- Unfortunately, implantation of these intrathecal drug delivery systems is not without risk. Aside from medication or dose related complications, surgical complications from intrathecal baclofen pump implantation can be categorized into pump, catheter and wound complications.¹ Early recognition of these complications is paramount for patient safety.

Case History

- 57 year old woman presented to the Pain Clinic for intrathecal baclofen pump replacement. Her past medical history is significant for a remote traumatic spinal cord injury with resultant spastic paraparesis. She underwent intrathecal pump placement in 2008 with reservoir exchange in 2015. Given age of catheter, we performed a catheter dye study prior to reservoir exchange. Cerebrospinal fluid (CSF) was aspirated from IDDS access port and contrast was given showing clear intrathecal flow without extravasation. IDDS reservoir exchange was then performed without complication.
- A few weeks after surgery, the patient suffered a mechanical fall landing on her abdomen and shoulder resulting in a proximal humerus fracture. Over the subsequent days, she developed mild lower limb pruritus and increased spasticity from baseline. Her psychiatry team prescribed oral baclofen as needed and increased her intrathecal dose. Patient suggested pruritus to be from a new laundry detergent.
- Unfortunately, the symptoms worsened and she was urgently referred for a catheter dye study. She was clearly in baclofen withdrawal with significant spasticity and pruritis refractory to oral baclofen. Serosanguineous fluid was aspirated rather than straw colored CSF. Upon contrast administration, it appeared to pool under the reservoir and was not evident in the intrathecal space. We obtained urgent operating room access for revision surgery with suspected catheter malfunction.

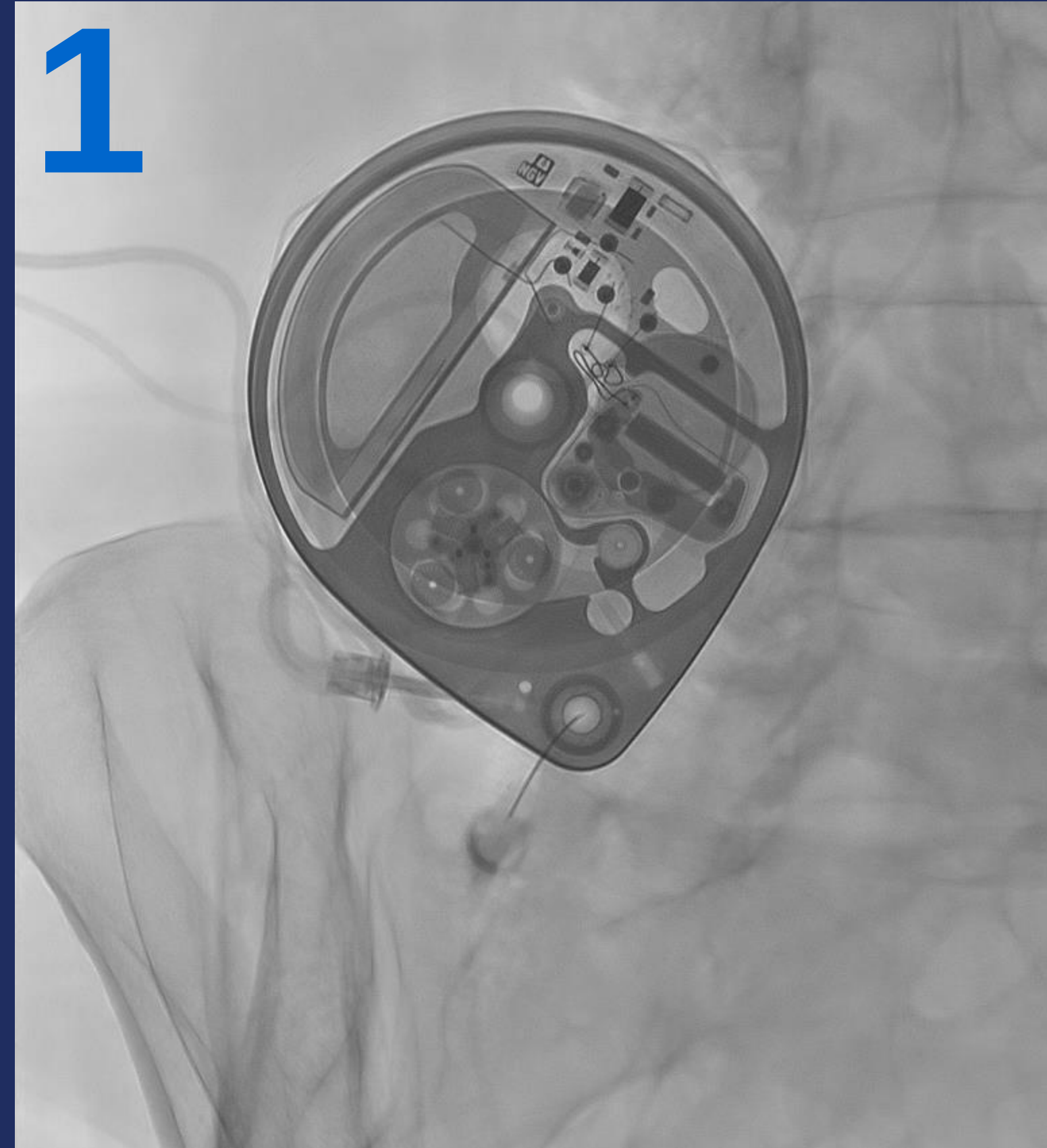


Image 1: Pre-contrast image of pump reservoir.

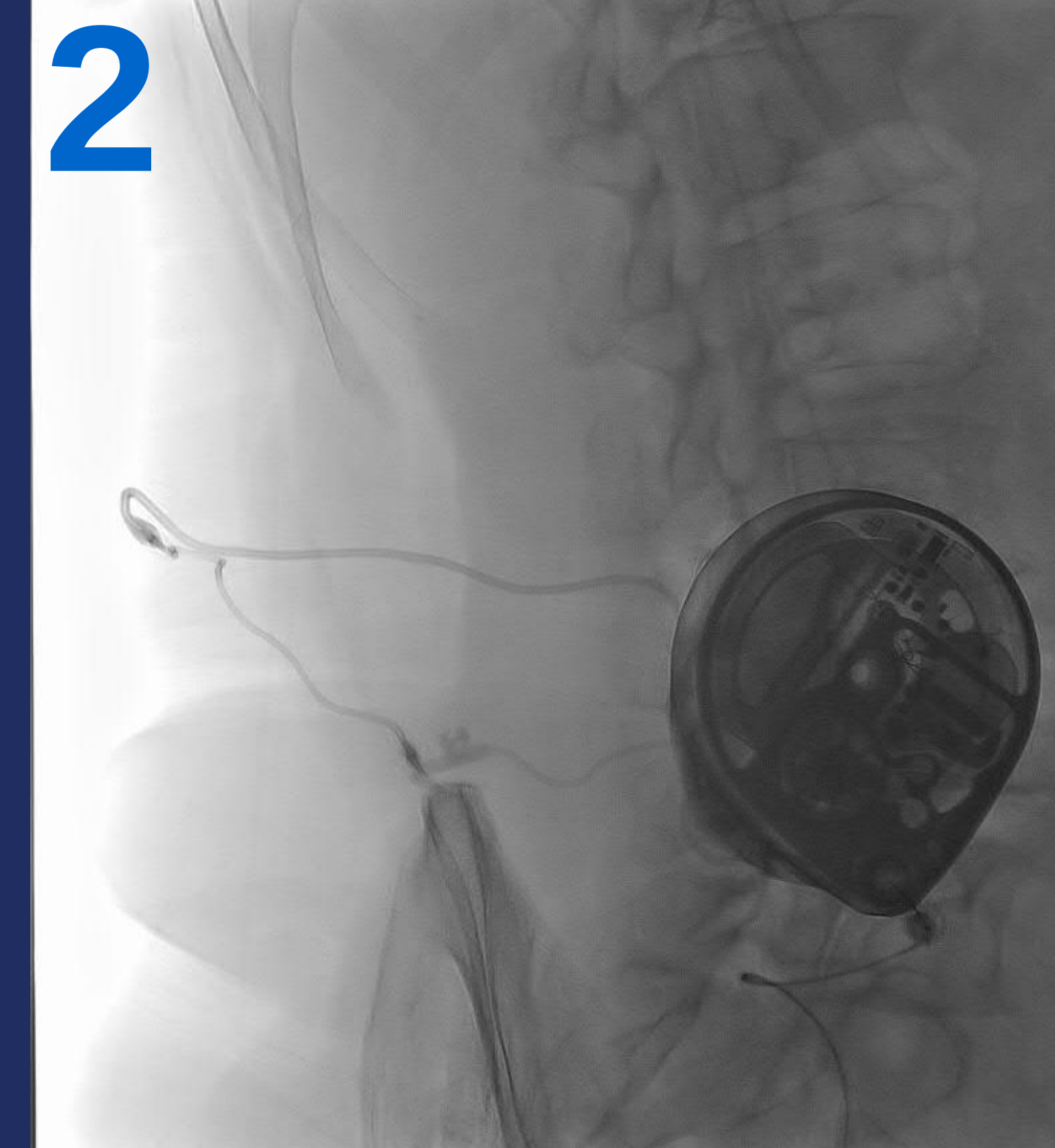


Image 2: Post-contrast injection showing contrast pooling near pump connector.

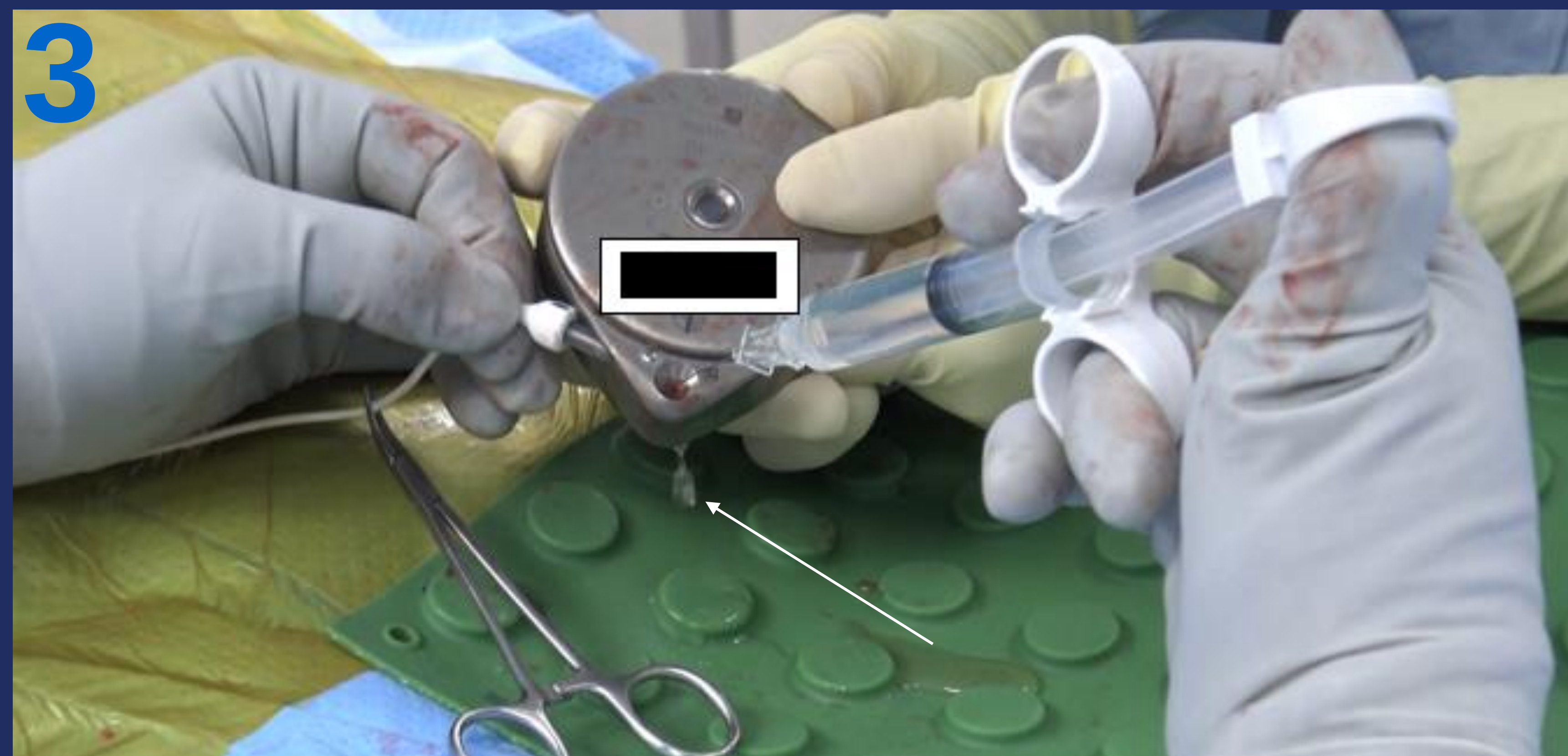


Image 3: Injection of saline into access port shows leakage at the pump connector.

Pump Revision

- We freed the pump reservoir and inspected the catheter and connection to the reservoir. Since no abnormality was identified, we proceeded with an intrathecal pump dye study which showed contrast very clearly reaching the intrathecal space and flowing out the catheter tip. Next, we cut the catheter about 10-20 cm proximal of the connector. We placed a mosquito clamp on the end of the cut catheter and administered sterile saline into the access port, which revealed a small amount of fluid leaking from the edge of the connection between the catheter and the reservoir. Gentle manipulation of the pump connector on the catheter port showed the leak was quite dynamic. Upon inspection of the pump connector after removal, it appeared to have a small indentation, possibly related to mechanical trauma. We spliced a new pump segment with connector to the existing catheter and confirm CSF aspiration from the access port and repeated a dye study ensuring continuity with the intrathecal space and do dynamic extravasation.
- The patient was restarted on her baseline simple continuous baclofen doing of 385 mcg/day and her oral baclofen was discontinued. After a one-night hospitalization for observation, she was discharged the following day with complete symptom resolution. Her spasticity returned to baseline.

Discussion

- Intrathecal baclofen pumps are a powerful tool in the management of refractory spasticity providing meaningful functional improvement. However, the potential for device related complications exists and baclofen withdrawal can be a life threatening event. Prudent detection of withdrawal symptoms and familiarity with surgical complications is of critical importance.
- Our case report demonstrates the potential for pump connector malfunction to reduce baclofen delivery into the intrathecal space. It is not known whether mechanical trauma was the reason for pump connector failure, or it repeated reservoir exchange without catheter or connector revision contributed to the issue. Physicians could consider replacing an old pump connector while performing a reservoir exchange to potentially reduce connector failure.

References

- Vender, J. R., et al (2006). Identification and management of intrathecal baclofen pump complications: a comparison of pediatric and adult patients. Journal of Neurosurgery: Pediatrics PED, 104(1), 9-15.