Multiple Complications of Intrathecal Drug Delivery System in a Single Patient

I present a case of a 62 year old male who sustained a blast injury in the workplace in 1990. Treatment included L5-S1 instrumentation for instability. T12 compression fracture was treated conservatively. Severe neuroforaminal stenosis at L5-S1 persisted. Patient presented to the International Pain Center sometime over the next 10 years for treatment of persistent back pain with radiation down both lower extremities. Conservative therapy was pursued ending with caudal lysis of adhesions X2. Patient did not respond to this therapy and was requiring increasing doses of oral narcotics and muscle relaxants. He was presented with Intrathecal Drug Delivery System concept as a method of controlling his pain.

- 03/2003 – trial of intrathecal baclofen without success.
- 01/2006 – intrathecal pump (ITP) near the end of its life. Infusing dilaudid 30mg/ml at 11.5mg/day. ITP replaced after weaning. MRI showed no granuloma.
- 01/2012 – Increasing dosage of IT dilaudid prompt MRI which reveals small granuloma at the tip of the catheter at T9. Dilaudid weaned off and replaced with normal saline. No cord compression and no new neurologic changes. Neurosurgery consult states surgery not necessary due to lack of cord compromise.
- 06/2012 – Repeat MRI reveals granuloma to still be present. No cord compression and no neurologic changes. Neurosurgery recommended not manipulating or removing the catheter for fear of dislodging the granuloma and patient refused placement of new catheter.
- 04/2013 – Oral medications losing effectiveness and patient requests new ITP catheter be placed.
- 05/2013 – ITP replaced and new catheter placed. Previous catheter cut and tied off and left in place. Dilaudid with bupivacaine placed in pump.
- 09/2013 – Patient presents to clinic with recurrence of bulge in midline of his back and with significant postural headache.
- 10/2013 – Surgery for CSF hygroma consisting of drainage and purse-string closure around catheter insertion site at fascial layer with Evicyl placement. Catheter gram performed at pump site port revealed no catheter leakage.
• 10/2013 to 01/2014 – Hygroma returns and headaches persist. Blood patch ruled out due to history of multiple back surgeries with instrumentation. Conservative therapy continued.
• 02/2014 – Neurosurgical exploration performed. Post-op diagnosis includes 1.) contained soft tissue lumbar pseudomeningocele, 2.) possible catheter fracture and 3.) partial L3-L4 laminotomies performed to assess dural entrance site of catheter. No leakage noted with valsalva maneuver times 2 to 40 cm of H20.
• 03/2014 – Headaches resolved. Return of small subcutaneous fluid collection.
• 06/2014 – Fluid collection enlarging. US guided aspiration. Cathetergram performed revealed normal function of catheter. Fluid analysis revealed positive for opiates but negative for Beta-2 transferrin.
• 08/2014 – re-exploration of back fluid collection. Seroma drained, catheter re-secured to fascia, bovie scarring after partial seroma capsulectomy with Evicyl placement. Abdominal binder post-op.
• 09/2014 – Seroma reformed. Aspirated under US guidance. Fluid analysis reveals positive for opiates and negative for Beta-2 transferrin. Patient elects to have ITP dilaudid weaned and pump is then explanted.

Intrathecal catheter granuloma occurs in approximately 01-0.5% of intrathecal catheter placement.\textsuperscript{1} Rapidly escalating doses of narcotic can be an early warning sign of granuloma formation. MRI with contrast is necessary whenever granuloma is suspected. Complications range from no symptoms to paraplegia. Conservative therapy for non-symptomatic patients is weaning from IT medicine and placement of Normal Saline in the pump. Failure warrants catheter repositioning, replacement or removal. Restarting of pump is best done with adjunct drugs to facilitate keeping narcotic at lower dosage. For symptomatic cord compression, neurosurgical intervention with mass excision and catheter removal is necessary.

Pseudomeningocele can occur in 1.5 – 6.25% of patients.\textsuperscript{2} Symptoms are usually postural headache with subcutaneous fluid collection. Fluid is positive for Beta-2 transferrin. Conservative treatment consists of bed rest, caffeine, epidural blood patch and sometimes acetazolamide. If persistent, surgical removal of the pump and catheter is warranted. Radiological evaluation of catheter is warranted to evaluate integrity of catheter.

\textsuperscript{1} Intrathecal Drug Delivery for Pain and Spasticity, T. Deer, Vol. 2, 2012, p. 105