

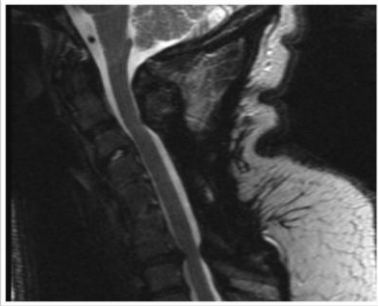
Neurologic Deficit With Use of DuraSeal: A Case Report and Review

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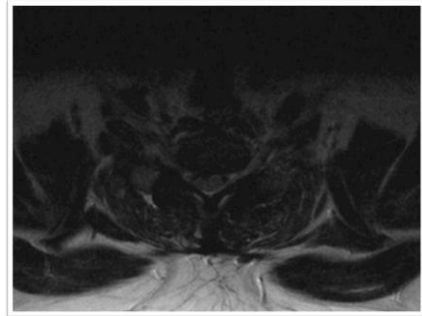
Clinical History and Presentation

- 49 YO female returns 7 years after a C5-6, 6-7 ACDF for C3-7 posterior decompression and fusion for stenosis and spondylosis.
- Physical exam reveals decreased sensation in her hands bilaterally and left lower extremity.

Pre-operative MRI



Pre-operative MRI



Plan

- C7-T1 ACDF

Intraoperative Course

- Durotomy at level of compression.
- DuraSeal placed upon dural defect, Gelfoam laid on top of sealant.
- Lumbar drain placed at end of case.
- Otherwise uneventful case, no changes noted in neuro monitoring.

Clinical Course: POD #1

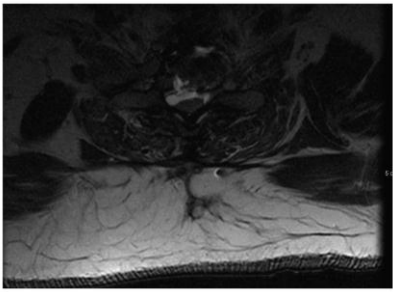
- Patient did well overnight and ambulated well with physical therapy in the AM.
- Became weak (2/5) in left IP late in afternoon.
- Emergent MRI C-spine obtained.

Post-operative MRI



"post-surgical subdural fluid pocket ventral to cord, filled by CSF and probably representing a subdural hygroma"

Post-operative MRI



"post-surgical subdural fluid pocket ventral to cord, filled by CSF and probably representing a subdural hygroma"

Clinical Course: POD #1

- Upon return from MRI, lumbar drain disconnect noted without flow from proximal catheter.
- Lumbar drain catheter reconnected and flushed with drainage reestablished.
- Neurological exam improved in LLE to 4/5 strength in IP, but RLE "ticklish" to touch.

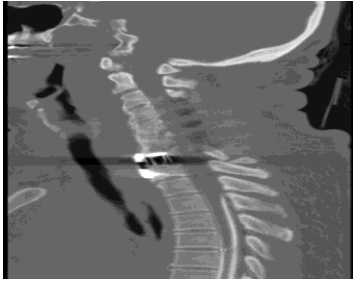
Clinical Course: POD #1

- Overnight lumbar drain with minimal output, requiring multiple flushes.
- LD replaced, passed easily to 20 cm with guide wire, but without CSF drainage, 5 cc flushed in and 5 cc returned.
- Again weak in left IP, now 3/5 in quadriceps. Patient reports needing to "see leg to move it."
- RLE strength, distal LLE strength and sensation preserved.

Clinical Course: POD #2

- CT Myelogram performed in AM through existing catheter, seen at T5-6 level.

CT Myelogram

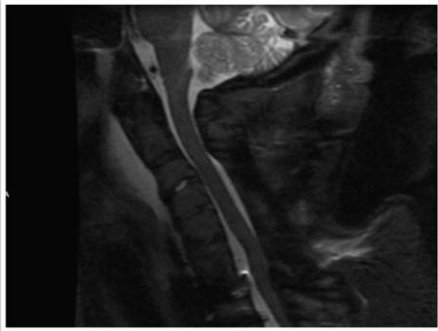


Tapered appearance of subarachnoid space at T2-3 indicated thecal sac compression and myelographic block.

Clinical Course: POD #3

- T2-3 subarachnoid shunt
 - Transpedicular approach performed for hygroma-pleural shunting
- Post operatively 4/5 RLE, 2/5 LLE initially, then 5/5 strength throughout except LLE (0/5)

Post-shunt MRI



Clinical Course

- Underwent rehab, returned to clinic with RLE numbness with good strength, LLE 2/5.
- Readmitted 2 months later for RLE weakness.

Post-shunt



R ventral "collection" with subjacent syrinx and hydromyelia

Clinical Course

- T1 transpedicular approach for fenestration of cyst, CSF emerged under pressure, no gelatinous material.
- Subtle improvement in SSEP's noted.
- Overall no improvement in neurologic status, minimal decrease in size of collection on MRI.

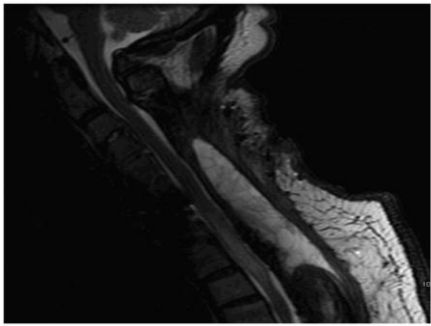
Final procedure

- Reoperative cervical laminectomies, T1-5 laminectomies, bilateral facetectomies, T5 with bilateral foraminotomies.
- C3-T5 fusion, C7 – T1 osteotomies, revision of cyst-pleural shunt.
- Amorphous proteinaceous material seen on histology (brownish material ventral to cord from reopening of dura at T2-3).

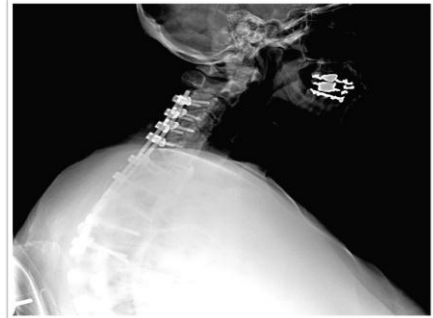
Post-decompression



Post-decompression



Post-decompression



Clinical Course

- Back to rehab.
- Ultimately walking.

Complications of DuraSeal

- Entrapped hematoma after cervical laminectomies and application for durotomy.
- Expansion after C5-6 ACDF with quadraparesis.
- Migration after application for durotomy for lumbar discectomy, causing radiculopathy and later cauda equina, proximal to site of durotomy.
- May increase risk for aseptic meningitis.

Radiographic Appearance

- High water content, so can mimic pseudomeningocele, inflammatory collection.
- Differentiated with contrasted CT scan and MRI using inversion recovery.
- Occasionally difficult with CT scan with contrast.

Durotomy

- Inadvertent durotomy 14%.
- Expensive.
- Associated with arachnoiditis, meningitis, epidural abscess.
- DuraSeal (polyethylene glycol hydrogel) useful adjunct for watertight closure in one study.
- Has been shown to be safe, also shown to reduce radiculitis.

Alternative

- Tisseel and other fibrin glues superior in one study, with less extent and severity of adhesions.
- No advantage to repair of duodenal perforation in rats using DuraSeal or fibrin glue in another study.
- *DuraSeal Exact* (shows promise in decreasing scar tissue formation after lumbar microdiscectomy).

Fibrin glues vs. Sealants

- Review of literature shows Tisseel enjoying wide off-label use.
- DuraSeal associated with two cases of paralysis.
- BioGlue described as “neurotoxic” even by manufacturer.
- EVICEL appeared in only two animal studies.
- DuraSeal Exact

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