

MINI-SURGICAL APPROACH FOR SPINAL ENDOSCOPY IN THE PRESENCE OF STENOSIS OF THE SACRAL HIATUS

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Spinal endoscopy is a useful tool for the management of intractable low back or radicular pain originating from post lumbar laminectomy syndrome, epidural scarring, or disc protrusions, and non-responsive to conservative modalities and other interventional techniques including fluoroscopically directed epidural steroid injections and percutaneous adhesiolysis. Spinal endoscopy requires that the caudal

canal be entered via the sacral hiatus. However, in a very small proportion of patients, access to the caudal canal is restricted because of stenosis or cartilaginous overgrowth of the hiatus. In such cases, the procedure is stopped because of the absence of an alternative approach to enter the epidural space with the spinal endoscope, resulting in non-availability of this treatment.

This report describes a novel method of dealing with the problem of cartilaginous obstruction of the sacral hiatus, using a mini-surgical approach to decompress the hiatus, allowing access into the caudal canal.

Keywords: Spinal endoscopy, adhesiolysis, epidural steroids, sacral hiatus

Spinal endoscopic adhesiolysis with the targeted delivery of epidural steroids is a useful technique in managing chronic intractable low back and lower extremity pain secondary to post lumbar laminectomy syndrome, lumbar epidural fibrosis, and disc protrusions, non-responsive to multiple modalities of treatment, including interventional techniques with fluoroscopically directed epidural steroid injections and adhesiolysis (1-7). Therapy is based upon direct visualization of the epidural space, with the identification of pathology, lysis of adhesions and specifically targeted application of medications to site of injury. Spinal endoscopic adhesiolysis includes the following:

- ◆ Mechanical neurolysis or nerve decompression, with disruption of scar around the nerve roots by the introduction and motion of the endoscope;
- ◆ Volume lysis of adhesions through the administration of up to 100 mL

of normal saline;

- ◆ Dilution of irritating chemicals through the administration of normal saline;
- ◆ The injection of local anesthetics and steroids to ventral lateral epidural space.

Endoscopy stands as a therapy intermediate between more conservative interventional techniques and surgery. As such, it is a cost-effective therapy (8), which provides an attractive, minimally invasive alternative to open spine surgery.

The caudal canal is accessed using a Seldinger technique, whereby a Tuohy needle is placed through the sacral hiatus and a guidewire passed through the needle into the space. A dilator/introducer sheath is placed over the wire to dilate the tissues around the sacral hiatus. The dilator is then removed, leaving the introducer sheath, through which the endoscope is passed into the epidural space, allowing the procedure to be performed.

Access to the sacral hiatus can be limited by cartilaginous or bony overgrowth of the hiatus, preventing entry of the dilator or endoscope. A study by Sekiguchi et al (9) demonstrated that the sacral hiatus was closed in 3% of the specimens which he studied. In instances of a closed sacral hiatus, the procedure has to be stopped.

We present here two case studies describing the minimal surgical removal of

tissue obstructing the sacral hiatus to allow access of the endoscope into the lumbar caudal canal.

CASE REPORTS AND DESCRIPTION OF MINI-SURGICAL APPROACH

The first patient was a 61-year old lady who suffered a slip and fall at work on 8/27/97 while attempting to sit on a rolling chair. She landed on her buttocks and had immediate back and neck pain. She was ultimately diagnosed with spinal instability at L4-5 and underwent a discectomy, hemilaminectomy and fusion with posterior instrumentation in July 1999. Prior to the procedure, her pain was limited to her back; after the procedure, she had leg pain rated 10/10 along with no relief of her back pain. A screw was felt to be out of place. She underwent a removal of hardware on February 2001, with no effect on her pain.

She was referred to pain management, where she received a series of lumbar epidural steroid injections, with minimal relief.

She was referred to one of the authors (sh) because of refractory pain. When seen, she had biaxial low back pain with radiation to the posterior lateral aspect of the right thigh. The pain was rated 10/10. She was being maintained with propoxyphene napsylate 100mg/acetaminophen 650 mg. Antidepressants and gabapentin were started.

Due to concern that her ongoing ra-

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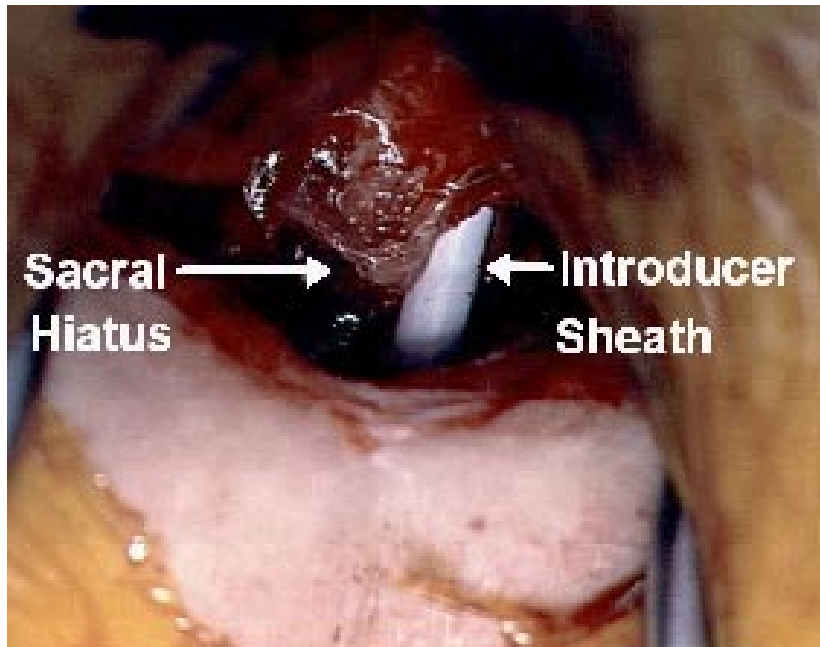


Fig. 1. Introducer sheath passing through the sacral hiatus into the vertebral canal

dicular pain was the result of epidural scarring, an epiduroscopy was scheduled under monitored anesthesia care.

At the time of the procedure, the vertebral canal was entered at its caudal aspect through the sacral cornu with a Tuohy needle. A 0.9 mm guide wire was inserted through the needle into the vertebral canal. A skin nick was made and a 2 mm EBI® dilator with a sheath was attempted to be passed over the needle through the cornu. Despite repeated and vigorous efforts, it was not possible to pass the dilator and sheath into the vertebral canal. The procedure was therefore stopped.

She was returned to the operating room with the presence of a neurosurgeon. A small vertical incision was made over the sacral hiatus under fluoroscopic guidance and the dissection was carried down until the hiatus was exposed. Cartilaginous tissue had overgrown the hiatus. The cartilaginous tissue was removed with a Kerrison rongeur.

With the obstructing tissue removed, the endoscope was easily placed in the normal manner with a Seldinger technique. Figure 1 demonstrates the introducer sheath passing through the soft tissues through the sacral hiatus into the caudal canal. Endoscopy was performed uneventfully, with mechanical lysis of adhesions with the endoscope, irrigation of the epidural space with saline, and the

perineural placement of steroid and hyaluronidase.

Upon completion of the procedure, she had a reduction in her Visual Analog Scale from 8/10 to 4/10, a level of relief which was maintained at 6 month follow up. She decreased her opioid intake from propoxyphene napsylate 100mg/acetaminophen 650 mg from 3 tablets per day to 1 tablet per day. She was able to stop her gabapentin. She required no more interventional procedures.

The second patient was a 61-year old male status post multiple lumbar laminectomies with residual left leg pain and progressive weakness in the extensor hallucis longus and calf muscles consistent with L5 and S1 radiculopathy and radicular pain. Previous attempts to place a spinal endoscope failed because of sacral atresia.

After implementation of appropriate monitoring and sedation, a Tuohy needle was placed into the caudal canal under lateral fluoroscopic visualization. Correct positioning was confirmed with dye.

The skin over the hiatus was anesthetized with local anesthetic and the tissue was dissected down to the hiatus. Using blunt dissection, the tissue around the hiatus was enlarged. The guidewire was placed, the needle removed and the introducer and dilator successfully placed into the epidural space. The endoscope was advanced to the L5-S1 junction on

the left. Chronic inflammation and scar tissue was seen at this point. An epidurogram showed very constricted spread. The endoscope was advanced using blunt and hydraulic dissection. A repeat epidurogram showed spread along the S1, but not L5, root. Further efforts to free the left L5 were hampered by concordant pain.

At the end of the procedure, 5 mL of 0.25% bupivacaine, 18 mg of betamethasone and 1500 units of hyaluronidase were injected. The wound was closed and the patient brought to recovery in good condition. Initial pain relief was excellent. Ultimately, the pain recurred and a spinal cord stimulator was placed.

CONCLUSION

Sacral atresia occurs in 3% of the population (9). This report describes a novel technique to deal with stenosis of the sacral hiatus preventing entry of an endoscope for the treatment of low back and radicular pain. Use of this technique allows the broader application of this useful procedure to patients who otherwise would not have been candidates.

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