A Case of Intolerable Pain due to Intradiscal Root Herniation and Entrapment Following Lumbar Surgery

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A 74-year-old female patient suffered unbearable pain and motor weakness that suddenly occurred 3 weeks after lumbar surgery. On magnetic resonance imaging, an unusual lesion was shown as intermediate signal intensity on T2 weighted image indicating neural components which has continuity from thecal sac to the disc space. Revision operation confirmed intradiscal root herniation and entrapment caused by underdiagnoses of suspicious of incidental ventral durotomy during previous surgery. Indirect dural repair with DuraSeal™ and Gore-tex® was performed and marked improvement of preoperative pain and weakness were noted following surgery.

Key Words: Nerve entrapment; Herniation; Discectomy; Dura; Injury.

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INTRODUCTION

Incidental durotomy after lumbar disc surgery is well known complication and reported up to 1.8–18.5% in various studies^{4-6,9,10,12-17}. In some instances, durotomies are unrecognized during surgery and these could lead to a severe postoperative complication. We report a case of intolerable pain that occurred after lumbar surgery with unrecognized incidental durotomy and intradiscal herniation of nerve root.

CASE

A 74-year-old female patient was admitted from severe left lower extremity pain (VAS 9) and ankle weakness (dorsiflexion grade 0, plantar-flexion grade 2) which started a week ago. She had no medical history besides hypertension but suffered from low back pain since 30 years ago. One month ago, she underwent lumbar 3/4 discectomy at other hospital as the diagnosis was herniated lumbar disc at L3/4. Subsequently, her symptom improved but after 3 weeks later, she complained of severe left lateral lower extremity pain and the ankle weakness. Postoperative magnetic resonance imaging (MRI) study (Fig. 1) was performed but the previous operator considered as negative finding and maintained medication and rehabilitation. The patient

could not bear with the pain and there was no motor improvement. We performed electromyography and found left L5 radiculopathy. We postulated that there was a remnant disc fragment on L3/4 level left side (Fig. 1, arrow) and underwent revision surgery. Contrary to our expectation, we found herniated roots in disc space rather than disc fragment (Fig. 2). Thecal sac defect was noted from the left side to the ventral portion and the end of ventral defect was not identified. We sealed the defect with Gore-tex® (W. L. Gore & Associates Inc, Flagstaff, AZ, USA) graft and DuraSeal™ (Covidien, Waltham, MA, USA) (Fig. 3). Post-operatively, the severe pain subsided gradually and eliminated on post-operative day 7. There was no cerebrospinal fluid (CSF) leakage and the wound healed without any complication. Six months after surgery, the patient was totally pain free and the left ankle motor improved (dorsi-flexion grade 4, plantar-flexion grade 4+).

DISCUSSION

Incidental durotomy could be notable during the surgery, but sometimes it is missed if not carefully inspected. Among unaware cases, some are solved with natural healing but some cases may lead to CSF leakage and furthermore, root herniation with entrapment could happen. Root herniation could oc-

cur any side of thecal sac where the durotomy is made. In case of discectomy with accidental ventral durotomy, it could lead to intradiscal root herniation with entrapment. The incidence of this complication is not reported yet and there are only a few case reports of this condition^{3,18}. Intradiscal root herniation could be misdiagnosed as intrathecal disc herniation or underdiagnosed because of its unfamiliarity. It is important to aware of this condition with meticulous review of patient history, clinical features, and post-operative MRI findings.

Abrupt and severe pain subsequent to lumbar surgery is important clue especially if the symptom starts few days after surgery. If the pain aggravates immediate after surgery, surgeon should consider the possibility of remnant disc, neural damage during operation, or hematoma more carefully. However, if the pain occurs after some interval, especially more than a week like our case and previous reports^{3,18}, neural entrapment syndrome should be considered, if not the cases of recurrent disc herniation. In addition, clinical feature is another important clue. Ahn et al.¹ summarized the typical symptoms of nerve root entrapment syndrome. It is characterized by relapse of in-

tractable radicular pain that may be either dermatomal or no dermatomal, resembles electric shock in nature. The pain is aggravated by walking or position change and is accompanied by various neurologic deficits. For the present case, the patient had unbearable pain (VAS 9) even at the supine position and was impossible to walk because of aggravation. For the MRI findings, CSF fluid collection and continuity of neural components would be the evidence of intradiscal root herniation. The CSF fluid collection is most typical finding in most of the dural injury cases. It may be collected in disc space or form pseudomeningocele dorsal to the thecal sac². For the image of neural components, Bae et al.³ suggested that the nerve root displacement could be observed like a shape of gull's wing on sagittal MRI. Additionally, we suggest one of the most important MRI finding would be the intermediate signal and continuity of nerve roots from the thecal sac to the disc space on T2 weighted axial image (Fig. 2). It is a good indicator to distinguish with intrathecal disc herniation which shows low signal intensity on T1 and T2 weighted MRI⁸.

Standard method for dural tear repair is primary suture with or without sealants augmentation^{7,11}. If the durotomy is in lateral or dorsal side of thecal sac, it could be handled with stan-

Fig. 1. T2 weighted axial MRI after previous surgery. Arrow indicates the herniated roots after disc space.

Fig. 2. Microscopic view of herniated swollen root.

Fig. 3. Thecal sac and the herniated roots are covered with Gore-tex® graft (A) and sealed with DuraSeal™ sealant (B).

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dard method but if the dural tear occurred in the ventral side, the repair could be complicated. One way is to repair through dorsal dura making an additional incision. However, this approach may be much burden for surgeon and occasionally cause unfavorable results in spite of the efforts. In our case, we used Gore-tex® to cover the defect and sealed with DuraSeal™ instead of suturing method. Intra-operative Valsalva showed no evidence of CSF leakage and post-operative drainage was tolerable either. We had good outcome without any additional complication using indirect sealing and suggests this method as an alternative for the complicated dural repair cases.

CONCLUSION

Spine surgeon should be cautious of incidental durotomy and consider root herniation/entrapment if the patient complains of intractable pain after surgery among other postoperative complications. As in our case, indirect dural repair using Gore-tex® graft and DuraSeal™ sealant may be a good option for ventral dural repair.

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