

Epiduroscopic Excision of a Discal Cyst Using the 1414 nm Nd : YAG Laser

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Laser ablation has become an important procedure in neurosurgery. It not only allows for precise dissection, but also offers excellent hemostasis and minimizes edema following surgery. The Nd : YAG laser has been developed and used to resect spinal lesions. We present the case of a 46-year-old man who experienced left leg pain due to a discal cyst at the L4–5 level. The patient underwent epiduroscopic laser ablation using the 1414 nm Nd : YAG laser. The discal cyst was successfully removed, with symptom resolution. Epiduroscopic laser ablation may be a good alternative to open surgery in the case of discal cysts.

Key Words: Discal cyst; Epiduroscopic; Laser ablation.

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INTRODUCTION

Discal cysts are intraspinal non-meningeal cysts that have a distinct connection to the corresponding intervertebral disc¹⁻⁴. Discal cysts in the lumbar spine may cause low back pain and radiating leg pain. However, their natural history is still unknown. The management of this condition, from conservative to surgical options, is still debated. Since its first use in glioma surgery in 1969, laser ablation has been used broadly. It was first applied during spinal surgery in 1986^{2,5-7}. Since then, many reports addressing the usefulness of different lasers in spinal surgery have been published.

The epiduroscopic procedure has long been used. However, its ability to remove protruded discs has been debated until recently⁸. Its inability to remove pathology limits its use. However, this limitation might be overcome by laser ablation. Laser ablation does not require any dissection. It results in less tissue damage, less bleeding and has a low risk of fibrosis compared to those of surgery. Here, we report a case of discal cyst that was treated with laser ablation. We also discuss the relevant literature^{8,9}.

CASE REPORT

A 46-year-old man was admitted for left leg pain, which be-

gan twelve months prior to admission. His past medical history was unremarkable. The straight leg raise test was positive on the left side at 30 degrees. The motor grade of his left ankle dorsiflexion was 5/5. That of extensor hallucis longus was 5/5. There was hypesthesia of the left L4 dermatome. Magnetic Resonance Imaging (MRI) of the lumbar spine revealed a cystic mass, which was attached to the lower part of the posterior annulus of L4–5 (Fig. 1). The patient underwent epiduroscopic laser ablation under local anesthesia. The epiduroscopic laser was introduced at the sacral hiatus and localized to the target lesion under fluoroscopic guidance. The discal cyst was confirmed. The Nd : YAG laser (Lutronic, Ilsan, South Korea) was used, with a wavelength of 1414 nm operating in the 0.75–12 W range. Laser energy of 480 mJ was delivered through a 550 µm bare optical fiber under epiduroscopic visualization (Fig. 2). The patient tolerated the procedure well. Histological examination revealed granulation and degenerative fibrous tissue surrounded by intact fibrous tissue that was consistent with a discal cyst. No epithelial lining was identified. The patient's symptoms improved significantly after surgery. A MRI performed 6 months postoperatively showed no definite residual mass.

DISCUSSION

Discal cyst is a rare entity that may cause low back pain and

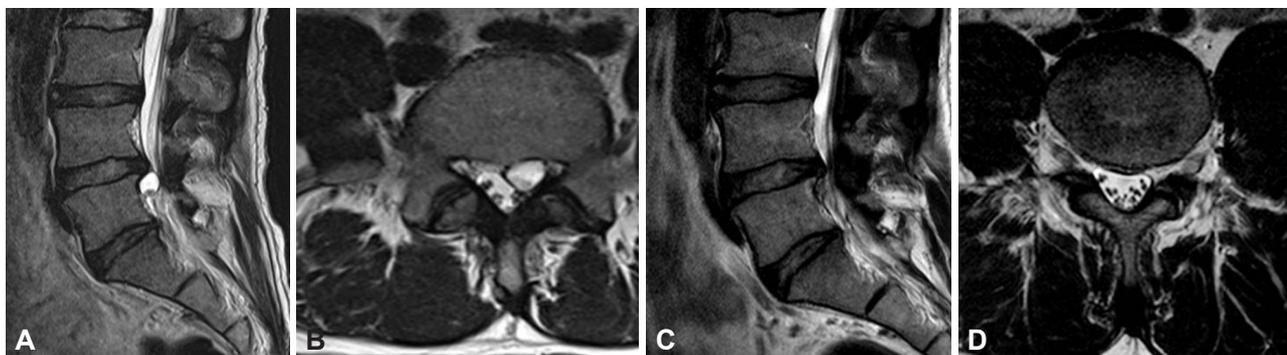


Fig. 1. Preoperative MRI. A : T2-weighted sagittal image of discal cyst on Lumbar L4–5. B : T2-weighted axial image of discal cyst. C : Post-operative T2-weighted sagittal image. D : T2-weighted axial image demonstrating the complete disappearance of the discal cyst.

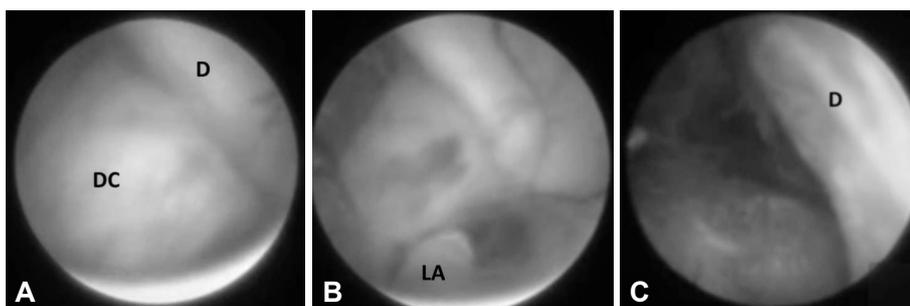


Fig. 2. Epiduroscopic view. A : The dural sac is compressed by the discal cyst. B : The discal cyst is ablated by the 1414 nm Nd : YAG laser. C : The dural sac is decompressed after ablation. DC : Discal Cyst, D : Duramater, LA : Laser fiber.

lumbar radicular pain. One potential mechanism of its development involves trauma to the intervertebral disc, which leads to an epidural hematoma. Liquefaction of the hematoma results in a cystic lesion beside the intervertebral disc. Another hypothesis is that the focal degeneration of the intervertebral disc, with fluid production, provokes an inflammatory response. These findings are nearly compatible with our case. Clinically, it must be differentiated from other pathologies, including herniated disc, perineural cyst, synovial cyst, epidural hematoma, ganglion cyst, flaval cyst, extradural arachnoid cyst, and cystic type schwannoma¹⁰⁻¹².

Chiba et al. described the following characteristics of discal cysts : clinical symptoms related to a unilateral single nerve root compression; lesions occurring at a slightly younger age and at a higher intervertebral disc level than those of typical disc herniations; minimal degeneration of the involved disc on imaging studies; communication between the cyst and the corresponding intervertebral disc; intralesional, bloody-to-clear serous fluid content; and absence of either disc material inside the cyst or of a specific lining cell layer on histological examination⁴.

The conventional treatment of discal cysts has been open surgery¹⁰⁻¹³. However, CT guided aspiration and an endoscopic approach have also been proposed as another treatment modality of discal cysts¹⁴. In our case, a cystic lesion was visualized by the epiduroscope. Serous fluid was confirmed after the cyst was penetrated by laser ablation. We successfully exposed and penetrated the discal cyst.

A 1414 nm Nd : YAG laser is the safest wavelength that offers precise dissection, while minimizing trauma to the spine muscles, bones or ligaments. It also offers better water absorption-

related thermal confinement, excellent hemostasis and reduced edema following surgery under local anesthesia⁸). Removing a cyst alone will result in cyst reaccumulation. We used epiduroscopic laser ablation for minimally invasive procedures. The operating time was only 30 minutes. The operative scar was minimal, and the patient was discharged one day after surgery. Therefore, compared to conventional techniques, the advantages of epiduroscopic laser ablation make it a preferable method for discal cyst treatment¹².

CONCLUSION

We present a case of a discal cyst that was successfully removed by epiduroscopic laser ablation. Our case suggests that laser ablation may be a good alternative to the surgical treatment of discal cysts. Laser ablation may be superior to surgery for several reasons. It does not require general anesthesia. In addition, compared to surgery, the procedure produces a smaller scar, requires less operating time, and allows for a fast recovery.

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