



Case Report

The role of full-endoscopic lumbar discectomy in patients with neurodegenerative disorders: Technical note and short literature review

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ABSTRACT

Background: Motor neuron disease includes a spectrum of neurodegenerative diseases with progressive courses and unfavorable prognoses. Here, we described a patient with a lumbar disc herniation (LDH) and isolated bulbar palsy (IBP), who successfully underwent a transforaminal full-endoscopic discectomy (TFED) without incurring the added risks of general anesthesia.

Case Description: A 58-year-old male with IBP had an LDH at the L4-L5 level. Avoiding general anesthesia, a TFED was successfully performed under local anesthesia with mild sedation. There were no perioperative complications, and the patient was discharged on the 1st postoperative day. The patient experienced complete relief of radicular symptomatology 1 year postoperatively.

Conclusion: Here, we present a rare instance of a patient with IBP who successfully underwent a TFED for an LDH performed under local anesthesia utilizing mild sedation, avoiding the risks of general anesthesia.

Keywords: Full-endoscopic lumbar discectomy, Lumbar disc herniation, Motor neuron disease, Neurodegenerative disorders, Percutaneous transforaminal endoscopic discectomy

INTRODUCTION

Motor neuron disease (MND) constitutes a group of neurodegenerative disorders that include isolated bulbar palsy (IBP). The clinical picture is characterized by the insidious emergence of dysphagia and dysarthria, with the initial preservation of respiratory function, and a more favorable prognosis than other MND subtypes.^[11]

Full-endoscopic lumbar discectomy (FELD) has gained recognition for its preservation of the dorsal musculature/spine elements that minimize intraoperative hemorrhage, thereby reducing perioperative morbidity and more rapid postoperative rehabilitation efforts. Further, advantages include the ability to perform transforaminal full-endoscopic discectomy (TFED) or interlaminar full-endoscopic discectomy under local anesthesia and mild sedation.^[4-8]

Here, we present a patient with IBP who successfully underwent a TFED for an L4-L5 lumbar disc herniation (LDH) and under local anesthesia.

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CASE PRESENTATION

A 58-year-old male with a history of IBP and chronic symptoms of dysphagia/dysarthria over the past 10 years, acutely presented with the right-sided sciatica. Clinically, he had the right L4 and L5 radiculopathy (2/5 weakness/sensory changes).

The MR showed a right-sided lateral foraminal-extraforaminal disc herniation at the L4-L5 with mild lateral recess stenosis [Figure 1]. Due to the history of IBP, the patient was not a candidate for general anesthesia (e.g., risks of upper airway obstruction). Therefore, the procedure was performed under mild sedation with analgesia (fentanyl ampule). Therefore, a TFED was performed in the lateral decubitus position under local anesthesia with mild sedation. The needle entry point was marked at 11 cm lateral to the midline [Figure 2]. Under fluoroscopy, the transit corridor led to Kambin's triangle [Figure 3].^[3] Three reamers with gradually increasing

diameters (5.5, 6.5, and 7.5 mm) were sequentially utilized to perform an adequate L4-L5 foraminoplasty [Figure 4]. This allowed the cannula and endoscope to be introduced and facilitated disc excision with the graspers [Figure 5].

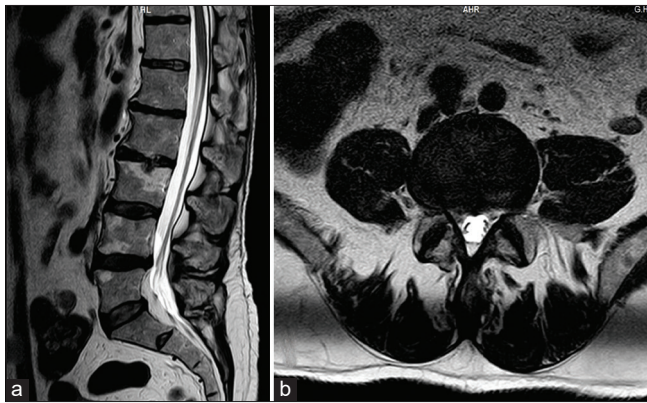


Figure 1: Preoperative (a) sagittal and (b) transverse magnetic resonance imaging analysis, demonstrating the presence of lumbar disc herniation in the L4-L5 level.



Figure 2: Preoperative positioning of the patient and anatomic design of the needle entry point.

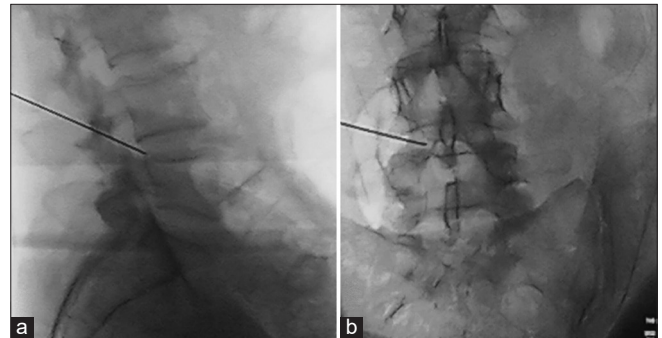


Figure 3: Gradual promotion of needle under constant fluoroscopic guidance in (a) lateral and (b) anteroposterior views.



Figure 4: Sequential passage of growing size reamers and foraminoplasty.



Figure 5: Excision of lumbar disc herniation with graspers by the endoscopic view.

The patient's postoperative course was uneventful; he was discharged on the 1st postoperative day.

DISCUSSION

The intraoperative management of IBP constitutes an especial challenge for the surgeon and anesthesiologist. Specifically, there are multiple contraindications for using general anesthesia, for example, significantly burden respiratory system [Table 1].^[1,2,9,10]

We, therefore, performed a minimally invasive TFED (e.g., preservation of dorsal musculature and spine anatomic elements, diminished traumatization, as well as minimization of intraoperative hemorrhage) under local anesthesia with mild sedation.^[4-8]

FELD has been performed in other patients with accompanying neurodegenerative disorders/Parkinson's disease (PD) [Table 2].^[4,5]

Kapetanakis *et al.* first described performing TFED for LDH in 11 patients with PD versus ten patients with LDH and no accompanying comorbidities' comparable clinical improvement were observed in both groups.^[4]

Kapetanakis *et al.* later prospectively studied 15 patients with PD and LDH for 12 months following TFED. Visual analog

scale for leg pain, Oswestry Disability Index, as well as all aspects of SF-36 showed statistically significant improvement 1 year postoperatively and the final outcome was not affected by sex or the operated level.^[5]

CONCLUSION

To our best knowledge, implementation of FELD for LDH in patients with neurodegenerative MND has never been reported in current literature. TFED under local anesthesia and mild sedation was uneventfully performed in a patient with LDH and IBP, for who general anesthesia administration would be remarkably perilous. Postoperative favorable outcomes demonstrate that TFED may be successfully conducted in this patient subgroup, when LDH is present. Nevertheless, further studies with greater population sizes are required in order to delineate the precise role of FELD in these patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms.

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Nil.

Table 1: Risks of general anesthesia administration in patients with MNDs.

Depression of ventilation on the ground of respiratory muscle weakness due to primary disease and subsequent chronic malnutrition – prolonged respiratory paralysis ^[1,2,10]
Extended requirements of postoperative ventilation ^[9]
Susceptibility in depolarizing (hyperkalemia) and nondepolarizing relaxants ^[1]
Further suppression of respiratory function due to intraoperative analgesia (e.g., opioids) administration ^[1]
Upper airway obstruction and aspiration due to laryngeal and pharyngeal muscle weakness and intraoperative ventilation depression ^[2]

Table 2: Brief description of studies regarding the performance of TFED for LDH on the ground of accompanying neurodegenerative disease in the current literature.

Authors	Year	Study type	Patients characteristics	Evaluation method	Follow-up	Results	Conclusion
Kapetanakis <i>et al.</i> ^[4]	2016	Case-control study	21 Patients 11 with PD 10 with no comorbidities	VAS-LP1 ODI1	12 months	PD patients featured similar to otherwise healthy subjects' improvement regarding VAS-LP and ODI assessment	TFED represents a beneficial and efficacious alternative for PD patients with LDH
Kapetanakis <i>et al.</i> ^[5]	2016	Prospective cohort study	15 patients with accompanying PD ¹	VAS-LP ¹ , ODI ¹ , and SF-36 ¹	12 months	TFED is capable of diminishing leg as well as low back pain, demonstrating also a positive effect on HRQoL ¹ in patients with PD	

¹PD: Parkinson's disease, VAS-LP: Visual analog scale for leg pain, ODI: Oswestry Disability Index, SF-36: Short form-36 medical health survey questionnaire, HRQoL: Health-related quality of life

Conflicts of interest

There are no conflicts of interest.

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