



Case Report

Lateral Retropleural Approach in Herniated Thoracic Surgery: A Case Report

L'Approche Latérale Rétropleurale dans la Chirurgie de la Hernie Discale Thoracique : À Propos d'un Cas

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ABSTRACT

Thoracic disc herniation is a rare entity. It represents 0.1% to 3% of all operated spinal hernias. The particularity of thoracic disc herniation is the high proportion of calcified forms. Persistent chest pain, thoracic neuralgia, and symptoms of spinal cord compression are the main reasons for surgical intervention. Diagnosis is made through magnetic resonance imaging. The surgical approaches can be anterior, lateral, and posterior. However, the lateral retropleural approach is rarely used by neurosurgeons as it requires opening the chest to access the spine. This approach has the advantage of better visualization of the hernia. However, complications can be serious, including lung, vascular, and dural injuries. We report the case of a 52-year-old patient presenting with back pain associated with progressive Frankel B paraplegia and sphincter problems. Magnetic resonance imaging revealed a compressive thoracic disc herniation at the T11-T12 level. We chose a left lateral retropleural approach with partial resection of the 11th rib. The choice of the left side was to avoid the risk of hepatic injury. We excised the hernia and placed a rib graft between the T11 and T12 vertebrae to promote fusion between the T11-T12 vertebrae. Most neurosurgeons opt for a posterior approach. Through this work, we recommend an alternative in the management of thoracic disc herniation.

RESUME

La hernie discale thoracique est une entité rare. Elle constitue 0.1% à 3% de toutes les formes de hernies du rachis opérées. La particularité de la hernie discale thoracique est la grande proportion des formes calcifiées. Les douleurs thoraciques rebelles, les névralgies thoraciques et le tableau de compression médullaire sont les principales causes d'indication chirurgicale. Le diagnostic se fait par une imagerie par résonance magnétique. Les voies d'abord peuvent être antérieures, latérale et postérieure. Toutefois la voie d'abord latérale retro pleurale est peu utilisée par les neurochirurgiens car elle requiert l'ouverture de la cage thoracique afin d'accéder au rachis. Cette voie présente l'avantage de mieux visualiser la hernie. Toutefois, les complications peuvent etres graves notamment des lésions pulmonaire, vasculaires et durale. Nous rapportons le cas d'un patient de 52 ans qui présentait une dorsalgie associée à une paraplégie Frankel B d'évolution progressive avec des troubles sphinctériens. L'imagerie par resonance magnetique a révéle une hernie discale thoracique compressive à l'étage T11-T12. Nous avons opté pour une voie latérale retro pleurale gauche avec résection partielle de la 11^{eme} cote. Le choix du côté gauche avait pour but d'éviter les risques de lésions hépatique. Nous avons procédé à l'excision de la hernie avec pose d'un greffon costale entre les vertèbres T11 et T12 dans le but de favoriser la fusion entre les vertèbres T11 -T12. La majeure partie des neurochirurgiens optent pour une voie postérieure. A travers ce travail nous recommandons une alternative dans la prise en charge de la hernie discale thoracique.

INTRODUCTION

Disc herniation is a fairly common condition with a frequency of 40 to 50 per 100,000 people¹. Conversely, thoracic disc herniation (TDH) is much rarer, with an estimated frequency of 1 per 1,000,000 people². TDH affects males more frequently than females, with highest incidence at 40 to 50 years of age³. Although TDH has been reported at every level, 75% occurs between T8 and T12^{3, 4, 5}. TDHs have a particular mode of revelation and progression, dominated by the risk of medullary compression¹. However other indications include intractable thoracic pain and neuralgia. The surgical approaches are varied from anterior, posterolateral and posterior. Surgery for TDH has a poor reputation because of its technical difficulties and the risk of potentially serious and hard-to-treat complications¹. We report a case of a 52 years old male who presented with a symptomatic T11-T12 thoracic disc herniation. The patient underwent surgery through a left lateral retropleural approach. In this presentation we provide a stepwise technical note of this approach

OBSERVATION

We report the case of a 52 years old male with contributory past history, who consulted at the neurosurgical department of neurosurgery at the Laquintinie Hospital of Douala for back pain and progressive lower limbs weaknesses evolving since 4 months. The symptoms aggravated later on by the installation of urinary incontinence. On physical examination we noted a Frankel C paraplegia, brisk reflexes and a Babinski sign. The sensory function was conserved. We concluded in a spinal cord compression with the compression of the thoracic spine. A Magnetic Resonance Imaging (MRI) ordered and revealed a T11-T12 thoracic disc herniation with significant compression on the spinal cord with complete effacement of the cerebrospinal (CSF) at the site of compression (Figure 1). The MRI also revealed a hypersignal image of the spinal cord. The herniated disc presented no sign of calcification.



Figure 1. (a) sagittal T2 MRI representing a T11-T12 herniated disc with significant spinal cord compression with hypersignal. (b) the axial image shows complete effacement of CSF due to the presence of a herniated disc compressing the spinal cord. Note the intensity of the disc appears non calcified.

We indicated surgery and chose a left posterolateral and retropleural approach. The patient was positioned on the right decubitus position (Figure 2). After keen palpation of

the ribs, we identified the left T11 rib and a skin marking was done over it.

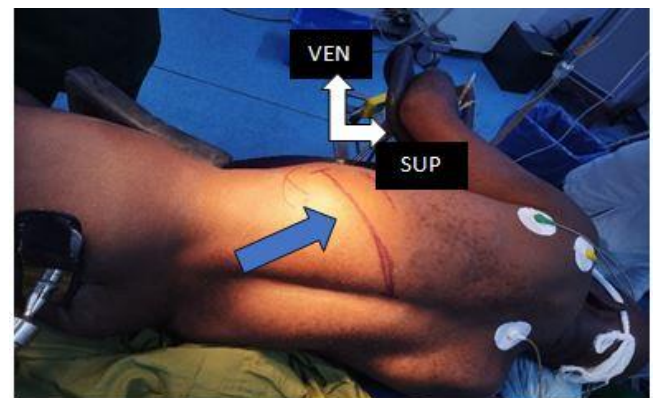


Figure 2. Patient on right lateral decubitus exposing the left lateral side and skin marking (blue arrow) over the T11 rib. Note : VEN = ventral SUP = Superior in the anatomical positioning of the patient.

The next step involved infiltration with xylocaine and adrenaline over the skin marking. A 7 centimeter (cm) skin incision was done extending from the midline of the spine extending over the T11 rib (Figure 3). After the skin incision we discovered superficially the subcutaneous fat and later the Latissimus dorsi muscle and a small part of the Serratus major muscle (Figure 3).

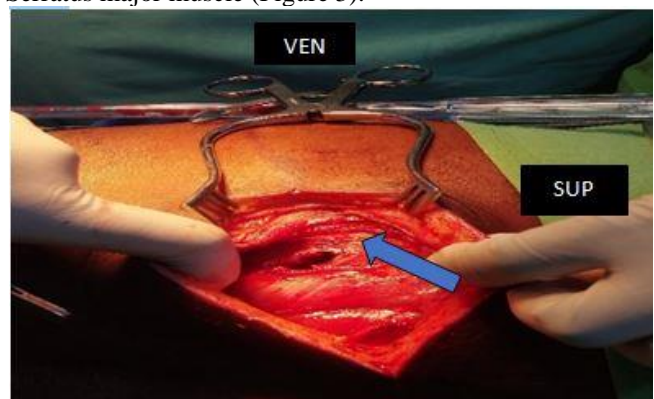


Figure 3. After skin incision we discover the Latissimus dorsi muscle (blue arrow)

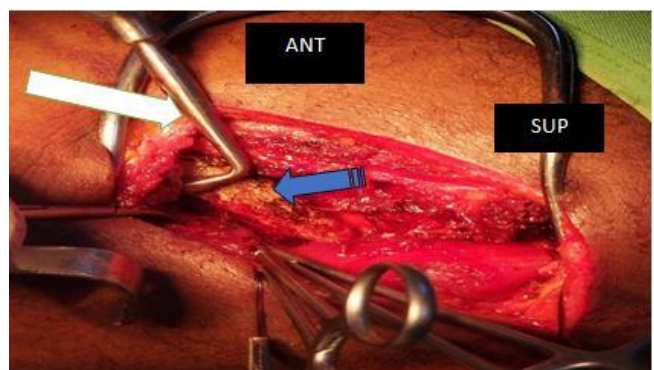


Figure 4. Exposure of the T11 rib (blue arrow). The bone is separated in two steps ; initially with a Penfield dissector then afterwards with a Doyen permitting the isolation of the rib from the intercostal muscles. Note that the Doyen is introduced underneath and as from the inferior border of the rib.

We palpated the T11 rib bone underneath the muscles and used electrocautery to incise on the muscles in the same direction of the skin incision. After this procedure, the T11 rib bone and intercostal muscle were exposed. A keen dissection to separate the intercostal muscles from the T11 rib was done from its inferior border (T11) using a penfield dissector. Then a Doyen was used to completely isolate the rib from intercostal muscles attachments (Figure 4). By so doing we also separated the rib from the intercostal vessels and nerve. The next step involved using a rib shear to cut the rib the closest possible to the costovertebral joint. After cutting the rib, the pleura was visualised and an Allison lung retractor was used to retract the lung from the surgical field (Figure 5). We then used an intraoperative X ray to identify the T11-T12 intervertebral disc space. After identification, we used a series of Kerrison, rongeurs, curettes and a dissector to excise the herniated disc (Figure 6). After total excision of the herniated disc we were able to visualize the posterior longitudinal ligament and a bone graft gotten from the excised rib cage was placed between the T11 and T12 vertebrae in order to favour fusion. The closure was done first at the muscle levels using a Vicryl 1 stitch, the subcutaneous tissue with a Vicryl 2-0 and finally the skin using Nylon 2-0. We did not place a subcutaneous drain.

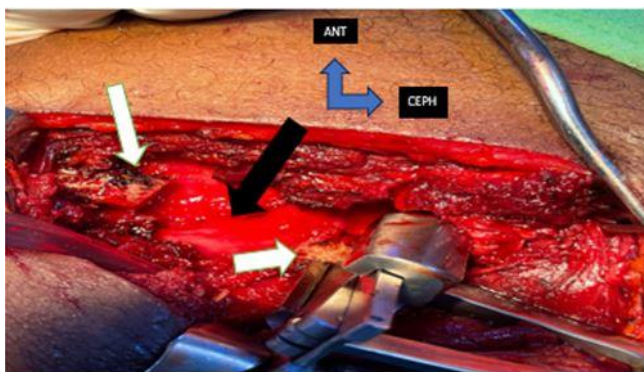


Figure 5. A rib shear was used to cut the T11 rib. The white arrows indicate the two ends of the rib. The black arrow indicates the pleura exposed. Note that the pleura was not opened.

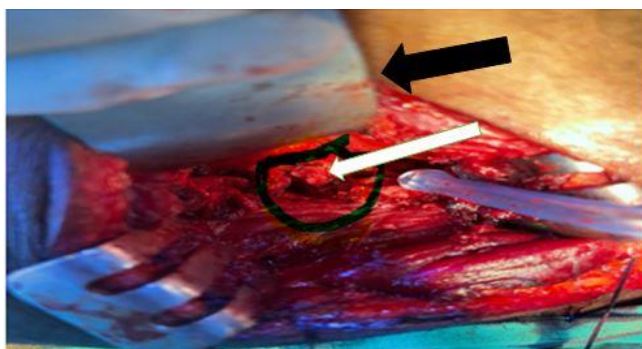


Figure 6. Showing the exposure of the intervertebral disc (white arrow) after using Kerrison rongeur to excise the herniated disc. Meanwhile, the black arrow shows the Allison lung retractor to continually retract the lung from our surgical field.

DISCUSSION

Symptomatic thoracic disc herniation accounts for only 0.1% - 3% of all herniated discs⁶. In Cameroon several studies on lumbar and cervical disc have been reported⁷. However to date no article have been reported on the management of thoracic disc herniation. Indications for surgery include intractable back pain, thoracic neuralgia and neurologic deficits. Our patient presented with a Frankel B deficit. The diagnosis is made with the aid of an MRI. The finding was conclusive of a non calcified herniated disc. The particularity in thoracic herniated disc is the high frequency of calcification accounting for about 42% of all thoracic herniated discs². In our case, we planned a left posterolateral approach to gain access to the hernia. This approach has been described by other authors⁸. However this approach is not indicated for calcified herniated disc⁹. The choice of approaching on the left is to avoid injuries to the thoracic duct and the liver. The lateral approach provides a better visualization of the herniated disc though the approach requires entering the thoracic cavity which is generally unfamiliar to spine surgeons¹⁰. Open thoracotomy has shown more pulmonary complications among which atelectasis and pulmonary infections¹⁰. These complications are less encountered with the mini invasive technique in lateral approaches. In order to avoid pulmonary complications, it is advisable to work retropleurally and avoid a long period of lung retraction. These two manoeuvres will respectively prevent us from using a chest drain and atelectasis. Other complications reported are thoracic neuralgia¹² and dural tears¹³. We fortunately did not encounter these complications. Fusion techniques have always been reported¹⁰. In our case we used the excised rib as our fusion tool. The bone graft was placed between T11 and T12 for fusion. The lateral retropleural is an uncommon approach in our setting but offers better visualisation of the herniated disc and can be a good option in the management of some forms of TDHs.

CONCLUSION

Symptomatic thoracic disc herniation is a rare condition, accounting for a small percentage of all herniated discs. While there is a lack of literature on the management of thoracic disc herniation in Cameroon, our case study highlights the importance of proper diagnosis and surgical intervention in cases of intractable back pain, thoracic neuralgia, and neurologic deficits. The use of a lateral posterolateral approach, while uncommon in our setting, provided a successful outcome in our patient, with minimal complications and effective fusion technique using the excised rib. This approach, though unfamiliar to spine surgeons, offers better visualization of the herniated disc and may be a viable option in the management of thoracic disc herniation. Further studies and exploration of different surgical techniques are needed to improve outcomes for patients with symptomatic thoracic disc herniation.

Conflict of Interest

None

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