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Our institutional experience with lateral extra-cavitary approach for posterior mediastinal neurofibroma. A case report

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ABSTRACT

The LECA to the thoracic spine can be used for the removal of posterior mediastinal neurofibromas which causes anterior and lateral spinal cord compression. It provides lateral exposure to the thoracic and lumbar vertebrae without entering the pleural cavity (extra-cavitary) and enables the surgeon to visualize the anterior dural surface better than with other posterior lateral exposures. In this case report, we describe the challenges we face while operating the posterior mediastinal tumour using this surgical approach. This approach provides better access to ventral and lateral thoracic and upper lumbar spine pathologies.

INTRODUCTION

The lateral extra-cavitary approach (LECA) to the thoracic spine was originally developed by Alexander (1) for the treatment of tuberculous spondylitis. (2) This procedure was later modified to expand its application to other anterior spinal column pathologic findings (e.g., fractures, infection, thoracic disk disease,) and it allows placement of posterior instrumentation. (3,4) The LECA to the thoracic spine can be used for the removal of posterior mediastinal neurofibromas which causes anterior and lateral spinal cord compression. It provides lateral exposure to the thoracic and lumbar vertebrae without entering the pleural cavity (extra-cavitary) and enables the surgeon to visualize the anterior dural surface better than with other posterior lateral exposures. (5) Access to the thoracolumbar junction using an anterior lateral approach (thoracotomy or thoracoscopy) requires the takedown of the diaphragm, which is completely avoided using the LECA. In the treatment of metastatic spine disease, the LECA is ideal for patients requiring resection of one vertebral segment for spinal cord decompression, reconstruction, and stabilization. It can also be used for patients with involvement of up to three vertebral segments.

Keywords

neurofibromas,
lateral extra-cavitary
approach,
mediastinal tumour,
thoracic spine



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CASE SUMMARY

A 45 years old female presented to us with chief complaints of pain in left mid back region for 2 months. Pain was continuous type throughout the day, progressive in nature, increases while resting posture and was not relived on medications. Patient was admitted and underwent MRI dorsal spine and screening of whole spine.

On MRI – well defined heterogenous altered signal intensity lesion noted in posterior mediastinal on right side extending from D-8 to D-11 vertebra. It is seen as heterogenous hyperintense on T-2 sequence and hypointense on T-1 sequence with contrast enhancement on T1 contrast MRI.

Lesion was seen abutting the adjacent vertebra. No bony erosion was seen. No intra-spinal extension was noted.

OPERATIVE TECHNIQUE

A. Positioning

The patient is placed into the prone position after the placement of intravenous and arterial access and an indwelling Foley catheter with chest rolls.

B. Skin incision

We took T shaped incision; vertical part of T was based on D8- to D11 spinous process and horizontal part of T was extending from midline of D-10 till about 5to 6 cm lateral.

C. Operative procedure

We have performed gross total excision of right paravertebral (D-8 to D-11) posterior mediastinal mass lesion by lateral extra-cavitary approach without opening pleura, by taking right paravertebral D-8 to D-11 T shaped skin incision as mentioned above.

D. Steps and Intra-operative findings

At right D-8 to D-11 region, transverse process and part of lamina was excised and the part of the attachment of ribs on lateral part of vertebrae was removed safely (costotransversectomy was done)

Dorsal mediastinal encapsulated mass encountered beneath the ribs pushing right lung laterally and mass was firmly adherent to medial pleural wall.

Small pleura tear was present while separating the tumor from medial pleural wall, while rest of the

tumor was found to be separable from medial pleura wall.

Mass was greyish pink in colour, firm to hard in consistency moderately vascular with well -defined plane from surrounding.

Gross total excision of tumor was done and repair of pleura followed by placement of intercostal drainage tube inside the pleural cavity.

E. Post operative events

Post-operatively, pt's HRCT chest was done showing mild amount of pleural effusion on right side with complete removal of mass lesion. ICD was removed on 3rd post operative day after resolution of pleural effusion. Suture was removed on 10th post-operative day. Pt was self-ambulatory with no post operative neurological deficit. On biopsy report, the tumour was found to be neurofibroma.

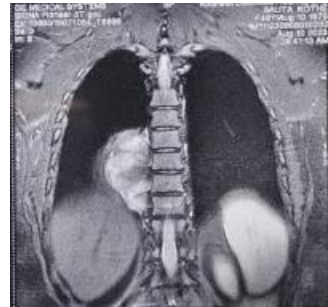


Figure 1.1. Coronal view.



Figure 1.2. Axial view



Figure 1.3. Lateral view.

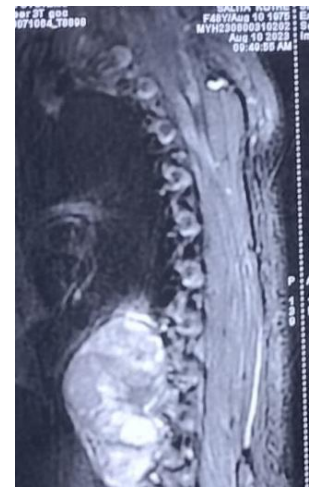


Figure 1. Shows coronal, axial, and lateral view MRI of chest. The tumour is present in posterior mediastinum at right paravertebral D8 to D11 region (pointed by red arrow).

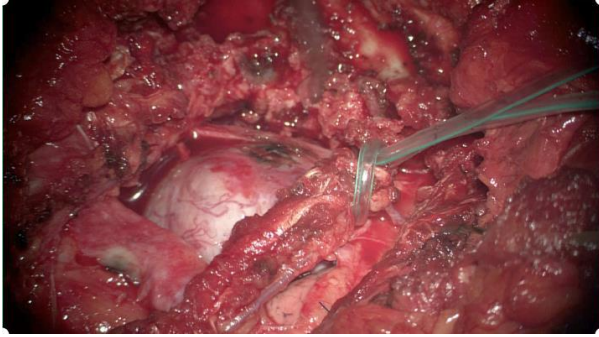


Figure 2. Intra-operative image showing tumour after costotransversectomy and separating it from medial pleural wall.

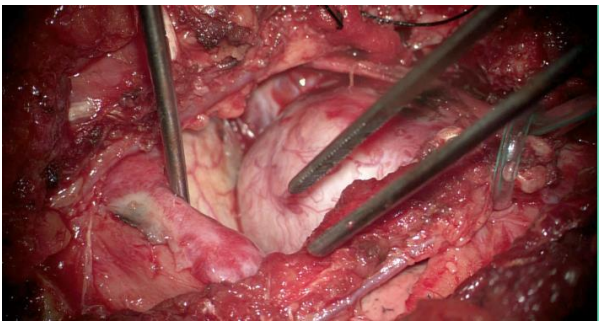


Figure 3. Shows the separation of tumor capsule from the medial wall.



Figure 4. Post - Operative HRCT Chest Showing Rt sided mild pleural effusion with complete resection of posterior mediastinal tumour.

CONCLUSION

The LECA is a technically challenging procedure for a Neurosurgeons with a steep learning curve. Removing the posterior mediastinal tumor, staying extra cavity and without breaching the pleural surrounding wall is technically challenging procedure and needs much experience and expertise. In these procedures, the backup team of

thoracic surgeons is also many times essential as there can be risk of damage to pleura leading to pneumothorax or hemothorax, lung parenchyma and other vital structures in posterior mediastinum. Many times, it is one of the most versatile approaches to the spine with better visualization of anterior dural wall. Being a dorsolateral approach, it provides better access to ventral and lateral thoracic and upper lumbar spine pathologies.

Abbreviation

LECA - lateral extra-cavitary approach

MRI - Magnetic resonance imaging

CT - Computed tomography

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