

## Hydatid Cyst of the Lung Extending to the Dorsal Vertebral Area with Intramedullary Extension: A Case Report and Review of the Literature

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### Abstract

### Case Report

A case report and review of the literature on a lung cystic hydatid that reaches the dorsal vertebral area and has an intramedullary extension. Occasionally, the Echinococcus species that causes hydatid diseases can affect the spine and have significant neurological consequences. The young male patient in this case study had a hydatid lung cyst which extended into the intramedullary space and dorsal vertebral region reaching an intra dural space. The cyst had been treated with an anterolateral approach, requiring costectomy, decompression, and dorsal spine stabilization. The patient showed an important improvement after the procedure. The uniqueness and complexity of this case are highlighted by integrating a thorough literature analysis on the epidemiology, pathophysiology, clinical presentation, diagnostic difficulties, and therapy of spinal hydatid disease.

**Keywords:** Hydatid Cyst, Lung and Spine, Bone Invasion, Medullar Compression, Plat Dorsal Spine Fixation.

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## INTRODUCTION

The larval stage of Echinococcus granulosus or Echinococcus multilocularis is the origin of hydatid disease, often referred to as echinococcosis. It mostly affects the lungs and liver, however it can also occasionally affect other organs like the spine [1]. Approximately 1% of all instances of hydatid disease are spinal hydatid disease, which presents considerable difficulties in terms of diagnosis and treatment [2]. With an emphasis on the surgical technique and postoperative results, this report describes an unusual case of a hydatid cyst in the lung expanded into the intramedullary dorsal spinal with vertebral invasion.

## CASE PRESENTATION

A 25-year-old man from a rural area complained of lower limb weakness that has been becoming severe for four years along with back pain and inter costal neuralgia. A huge multicrystalline cystic mass was discovered in the left costovertebral angle, extending from D5 to D9, with destruction of the posterior costal arches of the 7th, 8th, and 9th ribs [Figure 1] [Figure 2]. Imaging examinations included thoracic TDM and spinal MRI also indicated this tumor

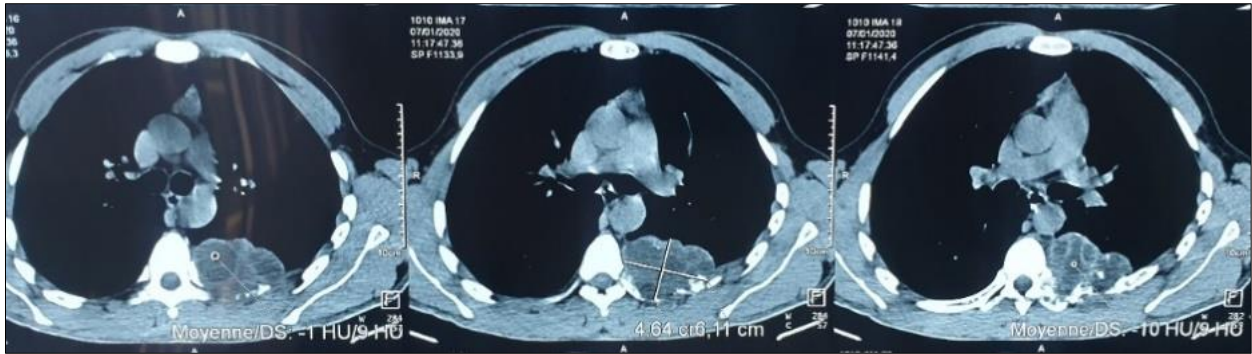
white tumor. At the D7-D8 and D8-D9 levels, the mass exhibited foraminal extension, and spinal compression was caused by endocanal extension. [Figure 3] [Figure 4]

**Beside:** The serology of AC Igg anti echinococcus was positive

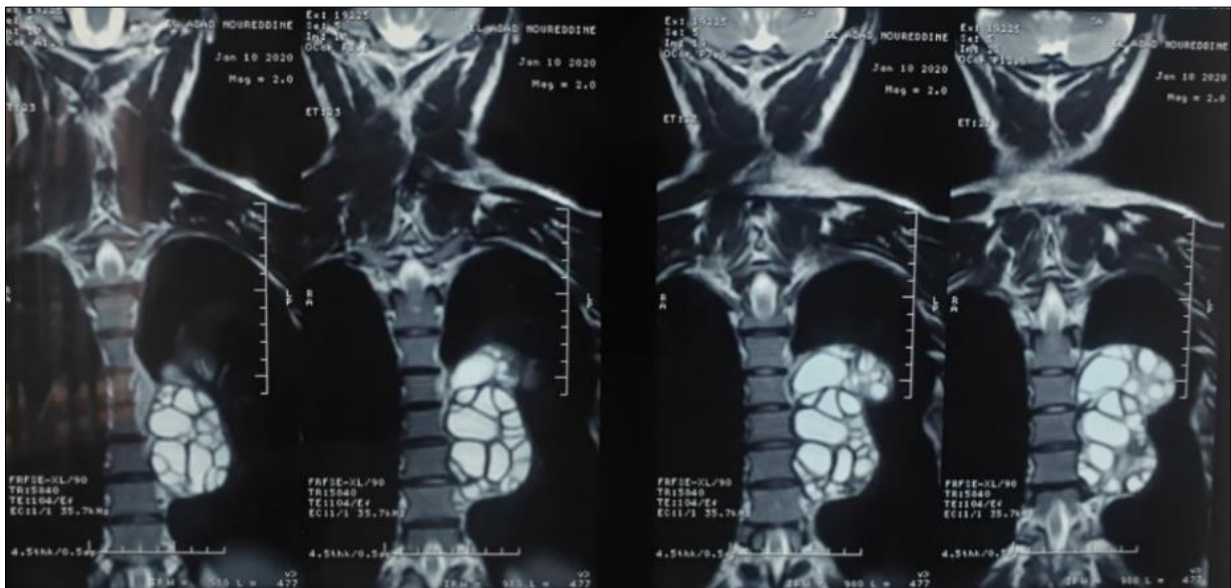


**Figure 1:** Chest 3D CT Image showing a destruction of the posterior costal arches of the 7th, 8th, and 9th ribs

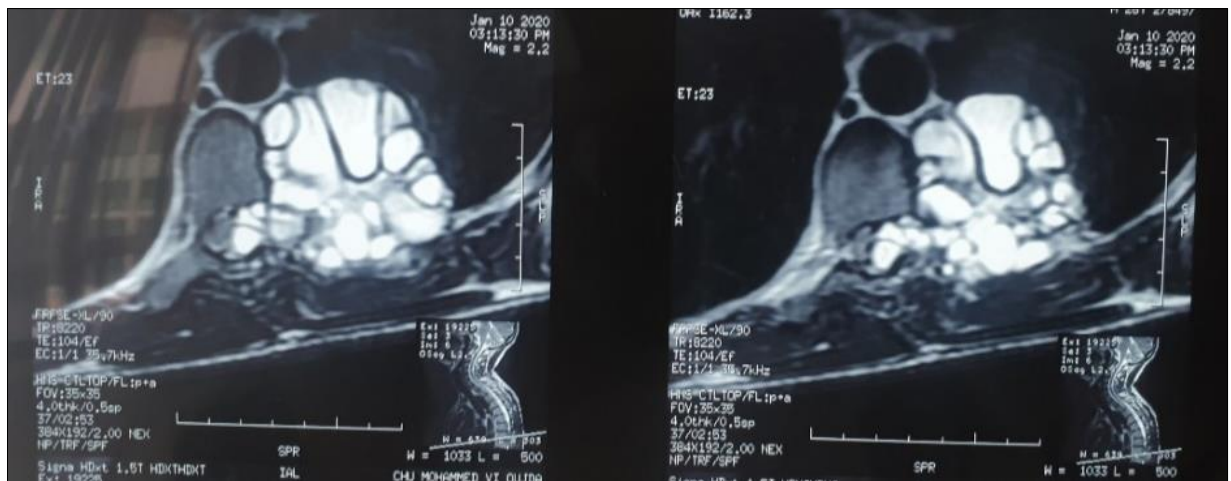
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**Figure 2: CT Chest Image Axial showing lung masse with costal and vertebral invasion**



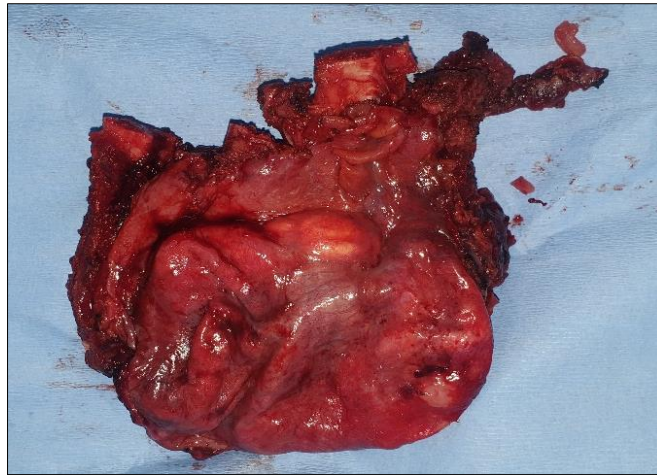
**Figure 3: MRI Image coronal T2 weighted Signal: showing multicystic lesion in Grape in the left lung**



**Figure 4: MRI Image axial T2 weighted signal: showing the involvement of the lesion into endocanalicular space through the foramen**

The procedure consisted a left lateral approach, costal resection of the 7th, 8th, and 9th ribs [Figure 5] cystic mass removal, foraminotomy at D7-D8-D9, intramedullary cyst resection [Figure 6], and stability was guaranteed by anterior spine plaque fixation from D7 to D9 [Figure 7]. A percutaneous drain was

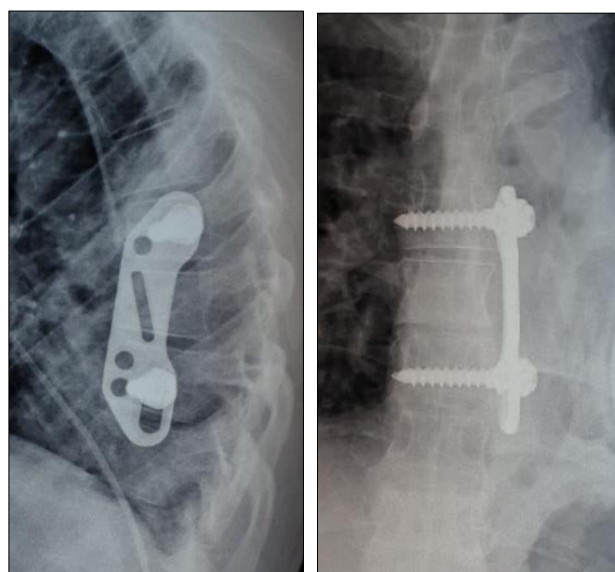
maintained in site for 72H. After that, patients received albendazole medication for six months at a dose of 15 mg/kg per day. Both the dorsalgia and the lack of neurological impairment were notable improvements for the patient.



**Figure 5: Picture of the specimen with costectomy**



**Figure 6: per-operative picture showing a part of the cystic lesion.**



**Figure 7: chest Image X: lateral view and face view showing the plat D7- D9 fixation**



## DISCUSSION

### Epidemiology and Pathophysiology

Hydatid disease is endemic in parts of Africa, Asia, the Middle East, South America, and the Mediterranean [1]. Echinococcus eggs are accidentally ingested by humans when they come into contact with infected animals, contaminated food, or tainted water [1]. The eggs break open in the intestine after being consumed, releasing oncospheres that pass through the intestinal wall and enter the bloodstream. After that, these oncospheres go to several organs, mainly the liver and lungs, where they grow into hydatid cysts [2].

Less than 1% of hydatid disease cases have spinal involvement, which frequently happens as a result of secondary spread [3].

### Clinical Manifestations and Diagnostic Challenges

Late diagnosis is common due to the subtle and vague clinical presentation of spinal hydatid disease [4]. Patients usually have progressive neurological impairments including motor weakness, sensory loss, and bladder or bowel dysfunction in addition to regional back pain and radicular discomfort but this is still not specific. respiratory symptoms may appear in the case of pulmonary involvement [5].

Particularly in endemic locations, a high index of suspicion is necessary for the diagnosis of spinal hydatid illness [6]. To diagnose and arrange surgery, imaging studies are essential. Because of its better soft tissue resolution, which aids in determining the degree of the disease and the involvement of spine components, magnetic resonance imaging (MRI) is the recommended para clinic examen to realize in this case. In addition to MRI, CT scans help with surgical planning and offer comprehensive information on bone involvement [7]. While serological tests like indirect hemagglutination (IHA) and enzyme-linked immunosorbent assay (ELISA) help confirm the diagnosis, they are not conclusive [8]. Histopathological examination of biopsy specimens confirms the diagnosis by revealing the characteristic laminated membrane and protoscolices [9].

### Pathological Characteristics

The structure of hydatid cysts is distinctive because it is multilayered. The fibrous capsule that forms the outermost pericyst comes from the host, the middle layer is a laminated membrane, and the germinal layer, which contains protoscolices, is the innermost layer. Hydatid cysts in the spine can lead to vertebral destruction, vertebral collapse, and spinal cord compression. Other hand the intramedullary extension indicates extensive disease progression, and malignancy of this benign lesion as observed in our case [10].

Our case involves a 25-year-old male who presented with a 4-year history of back pain and progressive lower limb weakness with intercostal neuralgia. A significant cystic lesion was discovered on MRI in the left costovertebral angle, spanning from D5 to D9. This lesion destroy the posterior coastal arches of the 7th, 8th, and 9th ribs and it invase foramen at the D7-D8 and D8-D9 levels, and got through into medullar space causing spinal compression at this level. A left Antero lateral thoracic approach with costal resection, decompression, and stability with an anterior spinal plaque from D7 to D9 were all part of the surgical strategy to guarantee the stabilization due to invasion of the articular and pedicle of these vertebrae. Albendazole therapy was administered in the postoperative care for 6 months as indicated in the literature, which led to a notable improvement in neurological function and the resolution of dorsalgia without resulting in a neurological deficit.

Reviewing the literature reveals the rarity of such extensive involvement. Turgut (2018) reviewed 253 cases of spinal hydatid disease and found that only a few cases with intramedullary extension and few of them have benefitted from spinal fixation either anterior or posterior [2]. Twelve cases of spinal hydatidosis were reported by Belzunegui *et al.*, (2002), highlighting the infrequency and challenges of diagnosing such a disease [3]. The case that we report is reinforcing the idea of focusing on such illnesses and the need for a multidisciplinary approach.

### Surgical Management and Outcomes

For spinal hydatid disease, surgery is still the mainstay of treatment. The main objectives are to decompress the spinal cord, remove the cyst, and stabilize the spine if there is any instability. The degree and localization and the vertebrae destruction indicate which surgical procedure is best.

The cystic lesion in the lung and dorsal spinal area was accessed in this instance using a left lateral thoracic approach. Through costal excision, the cyst was sufficiently exposed and it can be removed without rupture which is challenging, and its removal from the intramedullary area allowed for decompression in most cases a lavage with hypertonic serum and local albendazol are used. In this case, because the vertebral pedicle had been damaged anterior spine plaque fixation from D7 to D9 supplied the requisite stability [11], but we got to be aware of the complications such as Aort injury.

The left lateral approach is advantageous in cases of extensive disease involving both the lung and spine, as it allows simultaneous access to both areas. Following surgery, therapy with albendazole to lower the risk of recurrence and physical therapy to reinforce are essential [12].

### Clinical Case Review and Literature Comparison

According to Pamir *et al.*, (1984), this strategy was successfully used to manage complicated spinal hydatid patients, choosing the significance of precise surgical technique and complete postoperative care [13]. Similarly, Dkhissi *et al.*, (2020) pointed out the role of adjunctive percutaneous treatments by maintaining the drain in reducing the recurrency of the cyst [7-13].

### Comparison with Similar Cases

This case represents one of the rarest documented cases of intramedullary extension and widespread involvement in hydatid disease [14]. Even though Joshi *et al.*, (2016) and Sapkas *et al.*, (2007) have reported some complex spinal hydatid cases, their results did not include such an intramedullary dissemination [15, 16].

For better patient outcomes in terms of spinal hydatid disease, Abreu de Sousa *et al.*, (2016) proved the significance of complete treatment, involving both surgical and drug treatments [18, 19]. Pourghorban *et al.*, (2014) and Kumar *et al.*, (2007) reported a rare case of a primary intradural extramedullary hydatid cyst of the spine [17-20].

New therapeutic targets and preventative measures hope it will be revealed by exploring the molecular and genetic basis of Echinococcus infection [21, 22]. Additionally, the innovation of new pharmaceuticals less toxic and more effective than albendazole with fewer side effects may improve postoperative care and lower the risk of recurrence.

## CONCLUSION

This case demonstrates the complexity and infrequency of lung, dorsal vertebral, and intramedullary space involvement in hydatid illness. A proper multidisciplinary approach in addition to successful surgical care and postoperative albendazole drugs are the most important to achieve favorable results. But in another way, more study and collaboration worldwide should be considered to overcome this disease in terms of diagnosis, treatment, and prevention.

### Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understand that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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**Conflicts of Interest:** There are no conflicts of interest.

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