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Giant Parietal Wall Lipoma with Intrathoracic Extension in A 7 Years Old Boy: A Case Report

Zamil Hossain*[1], SM Ahsan Shahid[1]

1 Department of Paediatric Surgery, Rajshahi Medical College Hospital, Rajshahi

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***Correspondence to:**
Dr. Md. Zamil Hossain

ABSTRACT: Parietal wall lipomas are rare, benign tumors that consist of adipose tissue. When these lipomas grow to a giant size and extend into the thoracic cavity, they present unique diagnostic and management challenges, particularly in pediatric patients. We report a case of a 7-year-old male who presented with a large, progressively enlarging mass on the anterior chest wall. Clinical examination revealed a mobile, non-tender mass measuring approximately 12 cm in diameter. Imaging studies, including chest X-ray, CT, and MRI, revealed a well-defined lipoma with 30% intrathoracic extension, compressing adjacent lung tissue. The patient exhibited mild respiratory symptoms, but no signs of distress or hemodynamic instability. Surgical excision was performed under general anesthesia, and the mass was successfully removed without complications. Histopathological examination confirmed the diagnosis of a benign lipoma. Postoperatively, the patient recovered well, with no signs of recurrence during a 6-month follow-up. This case highlights the importance of considering giant parietal wall lipomas with intrathoracic extension in the differential diagnosis of pediatric chest masses. Early diagnosis and timely surgical intervention are critical in preventing potential complications such as respiratory distress.

Keywords; Parietal Wall Lipoma, Intrathoracic Extension, Pediatric Surgery, Benign Tumor, Chest Wall Mass.

Article at a glance:
***Study Purpose**: To report a case of a giant parietal wall lipoma with intrathoracic extension in a pediatric patient and emphasize the role of imaging and surgery.*
***Key findings:** Imaging revealed a giant lipoma extending into the thoracic cavity. Surgical excision was successful, and there were no complications during follow-up.*
***Newer findings:** This case adds that giant parietal wall lipomas with intrathoracic extension can be managed successfully with early imaging and surgery.*
***Abbreviations:** CT - Computed Tomography, MRI - Magnetic Resonance Imaging.*

INTRODUCTION

Lipomas, benign neoplasms composed predominantly of adipose tissue, are among the most common soft tissue tumors in humans, typically affecting the subcutaneous tissues.[1] The parietal wall, composed of skin, muscle, and connective tissues, is a relatively uncommon site for these lesions, but when they do occur, they often present as slow-growing, asymptomatic masses. Although lipomas are generally benign, their rare and unusual manifestations—such as giant lipomas with intrathoracic extension—pose significant clinical challenges. A "giant" lipoma is typically defined as a lesion exceeding 10 cm in its greatest dimension, and this threshold is clinically important due to the potential for increased mass effect and local tissue displacement.[2] The extension of parietal wall lipomas into the thoracic cavity is an even rarer phenomenon, with only a handful of cases documented in the pediatric literature.[3] This intrathoracic extension typically occurs through the intercostal spaces, pleura, or diaphragm, leading to compression of

adjacent structures, such as the lungs (Homo sapiens pulmonary system), heart, or large vessels. Such lesions may result in symptoms like dyspnea, cough, or pleuritic chest pain, depending on the extent of compression or infiltration.

This presents a critical concern for pediatric patients, whose developing structures may be more susceptible to significant functional impairment.[4] Diagnosis is often challenging due to the insidious growth of these tumors and the nonspecific nature of their symptoms. Imaging modalities, particularly magnetic resonance imaging (MRI) and computed tomography (CT), are invaluable tools for delineating the tumor's extent and its relationship with surrounding structures. MRI provides superior soft tissue contrast, allowing for clear delineation between lipomatous tissue and surrounding muscle or lung tissue, which is essential for preoperative planning. Additionally, MRI and CT are critical in identifying the degree of intrathoracic involvement and any potential compromise to vital organs, such as the lungs (Homo sapiens pulmonary system) or heart (Homo sapiens cardiac system). Surgical excision remains the definitive treatment modality for giant parietal wall lipomas, even in the presence of intrathoracic extension. However, the surgical approach requires meticulous planning to avoid damage to adjacent vital structures, particularly when the tumor extends into the thoracic cavity.[5] Postoperative recovery in pediatric cases is generally favorable, though long-term follow-up is necessary to monitor for recurrence, which is rare but possible. The current literature underscores the need for early detection and intervention to prevent potentially life-threatening complications in these patients

CASE PRESENTATION

A 7-year-old male presented to the outpatient Department of Paediatric Surgery, Rajshahi Medical College Hospital, Rajshahi, a progressively enlarging mass on the anterior chest wall, noticed by his parents over the past 2 years. The mass was asymptomatic initially, but the child had recently started to experience mild discomfort and occasional difficulty in breathing, particularly when lying flat. The patient had no history of trauma or other significant medical conditions. There was no history of fever, weight loss, or night sweats, which helped rule out infectious or malignant causes. On physical examination, a large, non-tender, mobile mass was palpated on the right anterior chest wall, measuring approximately 16 cm × 12 cm. The mass was well-defined and soft, with no overlying skin changes such as erythema or warmth. The overlying skin was intact, and there was no evidence of induration or fixation to deeper structures. The mass appeared to be confined to the subcutaneous tissue but was firm to palpation, suggesting that it might extend deeper.

A chest X-ray was performed, which showed a well-defined soft tissue mass, located in the anterior chest wall, with evidence of slight compression of the right lung base. To further evaluate the extent of the lesion, contrast-enhanced computed tomography (CT) of the chest was performed. CT imaging revealed a giant lipoma originating from the right anterior chest wall, with an intrathoracic extension of approximately 30% into the right pleural space. The mass was compressing the underlying right lung tissue, though no mediastinal or vascular involvement was noted. The lesion appeared homogeneous, with characteristic low attenuation consistent with lipomatous tissue. There were no signs of infiltration or malignancy. Magnetic resonance imaging (MRI) was subsequently performed for better soft tissue characterization. MRI confirmed the presence of a well-circumscribed mass measuring 18 cm × 12 cm× 12 cm, with clear delineation from surrounding muscle and bone structures. The intrathoracic extension was well visualized, and the lesion was found to compress the right lung parenchyma without affecting the heart or large vessels. Given the benign nature of the tumor and the lack of any malignant features on imaging, a decision was made to proceed with surgical excision of the lipoma. The surgery was planned under general anesthesia, with the expectation of an uncomplicated resection due to the mass's well-encapsulated nature.

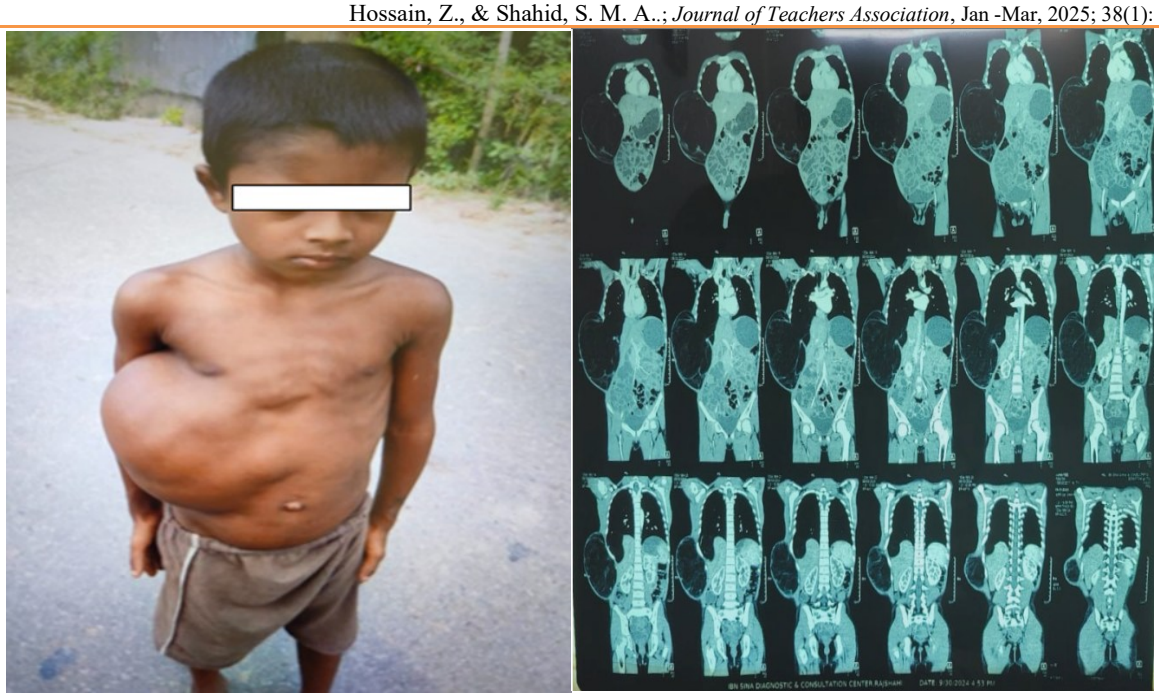

Figure 1: Radiological imaging showing the giant parietal wall lipoma with intrathoracic extension. The mass is clearly visible in both the chest X-ray (A) and contrast-enhanced CT scan (B), demonstrating the tumor's size and its extension into the thoracic cavity.

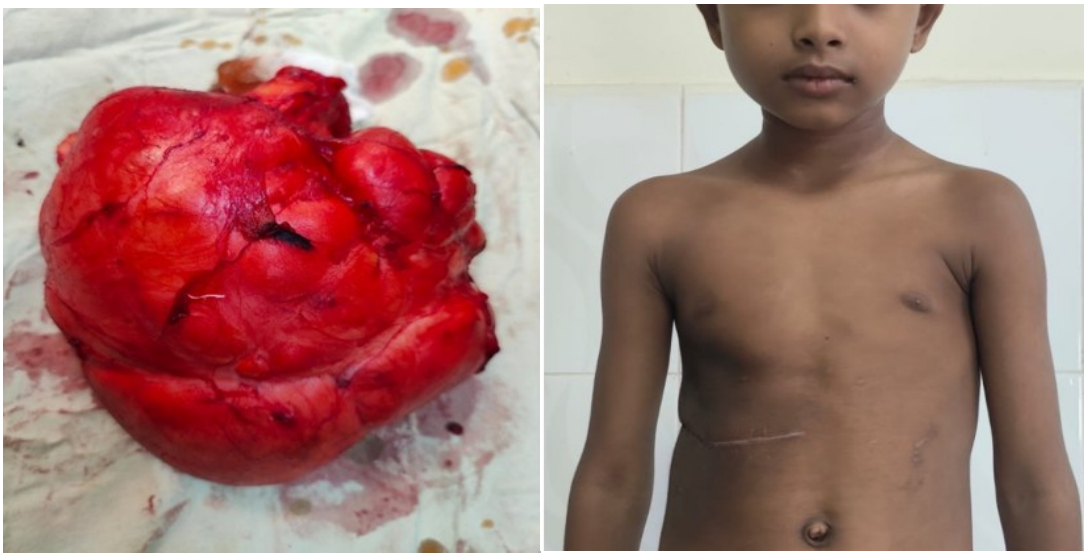

Figure 2: Intraoperative photographs of the surgical excision of the giant parietal wall lipoma. (A) The mass is exposed following dissection from the surrounding tissues. (B) The tumor after complete excision, demonstrating its large size and well-encapsulated nature.

MANAGEMENT AND OUTCOME

Surgical Approach

The patient underwent surgical excision of the giant parietal wall lipoma under general anesthesia. The surgical approach involved a transverse incision over the anterior chest wall, directly over the palpable mass. The tumor was carefully dissected from the overlying skin and underlying muscles. Given the tumor's large size (18 cm × 12 cm) and intrathoracic extension, the surgical team utilized a combination of blunt and sharp dissection techniques to separate the mass from the surrounding tissues, including the pleura and intercostal muscles. The tumor extended into the thoracic cavity through the intercostal space, compressing the lower portion of the right lung. As the lipoma was well-encapsulated, it was easily differentiated from the surrounding tissues, which

facilitated its complete excision. The surgical team took extra precautions to avoid injuring the adjacent lung tissue and the pleura, as any accidental puncture could result in a pneumothorax or other respiratory complications. Despite the large size and intrathoracic involvement, the surgical procedure was uneventful, and no major intraoperative complications were encountered. The mass was excised in its entirety, and the surrounding tissues were carefully inspected to ensure no residual tumor was left behind. The surgical site was then closed with absorbable sutures, and a drain was placed to evacuate any potential seroma or fluid accumulation.

Postoperative Care

Postoperatively, the patient was monitored in the recovery room under close observation, particularly for any respiratory distress or signs of pneumothorax, given the close proximity of the tumor to the lungs. The drain was monitored for the first 48 hours to assess any fluid buildup or seroma formation. The patient was kept on supplemental oxygen for the first 24 hours and closely monitored for any respiratory issues, although the patient remained stable throughout the immediate postoperative period. The wound was inspected for signs of infection, but no complications, such as wound infection or dehiscence, were observed. The patient was started on a regular diet after 24 hours and gradually mobilized with the help of the pediatric physiotherapy team.

Follow-Up

The patient was discharged from the hospital after 5 days of postoperative care with a follow-up appointment scheduled for 2 weeks after surgery. During this follow-up, the wound was evaluated, and the patient's recovery progress was monitored. The drain was removed at this visit, and the patient was advised to avoid strenuous activities for at least 4 weeks to allow proper healing. A chest X-ray was also performed to rule out any residual fluid collection or complications like pneumothorax. Further follow-up appointments were scheduled for 1-, 3-, and 6-months post-surgery, where the patient was assessed for any recurrence of the lipoma or signs of complications. Additionally, MRI was used during the 6-month follow-up to ensure no residual tumor remained and that the lung and thoracic structures were intact.

Outcome

The patient's recovery was uneventful. By the 6-month follow-up, the wound had fully healed, and the patient was free from any symptoms related to the lipoma or its excision. The postoperative chest X-ray and MRI confirmed complete excision of the mass, with no evidence of recurrence or intrathoracic complications. The patient resumed normal activities and showed no signs of respiratory distress or functional impairment. The patient's prognosis is excellent, with no recurrence at the 6-month follow-up. Given the benign nature of the lipoma and the successful excision, the patient is expected to have a full recovery. Long-term follow-up is planned at yearly intervals to monitor any potential recurrence, although recurrence rates for giant lipomas after complete excision are low.

DISCUSSION

Pathophysiology of Parietal Wall Lipoma

Lipomas are benign tumors composed predominantly of adipocytes and arise from the overgrowth of normal fat tissue.[6] They typically form in subcutaneous tissues but may also occur in deeper regions, such as the muscles or parietal wall. The exact mechanism of lipoma formation is not fully understood, though genetic factors, such as mutations in the HMGA2 gene, are thought to play a key role. Parietal wall lipomas develop in the subcutaneous fat overlying the chest wall, often originating from connective tissue or intercostal fat. These lipomas are generally well-circumscribed, encapsulated masses that can be mobile upon palpation. When these masses grow to a giant size (over 10 cm), their ability to extend into surrounding spaces, including the thoracic cavity, becomes a significant clinical concern. Intrathoracic extension of parietal wall lipomas is an extremely rare occurrence, with only a few documented cases in the literature.[7] This extension typically occurs through the intercostal spaces or diaphragm, where the fat tissue infiltrates deeper into the pleural space.

Intrathoracic Extension

The extension of a parietal wall lipoma into the thoracic cavity presents unique clinical challenges. As the tumor enlarges, it can compress adjacent structures such as the lungs (Homo sapiens pulmonary system), heart (Homo sapiens cardiac system), or blood vessels, leading to potential symptoms like cough, dyspnea, or pleuritic chest pain. In severe cases, this compression can impair

respiratory function and cardiovascular dynamics, especially in pediatric patients, whose anatomical structures are more flexible and vulnerable to compression. The mass effect on the lung tissue can lead to atelectasis or even respiratory failure if left untreated.[8] Additionally, large tumors can obstruct blood flow, causing reduced venous return or impacting cardiac output. While benign, these tumors can significantly alter the patient's clinical status if they extend into vital thoracic spaces.

Challenges in Diagnosis and Treatment

Diagnosing parietal wall lipomas with intrathoracic extension can be challenging, particularly because they may present similarly to other chest masses such as abscesses, benign or malignant tumors, or even metastatic lesions. The clinical presentation of a slowly enlarging, asymptomatic mass may also lead to delayed diagnosis. Imaging plays a crucial role in distinguishing lipomas from other mass lesions. Chest X-rays may provide an initial clue, but computed tomography (CT) and magnetic resonance imaging (MRI) are essential for accurate diagnosis. MRI, in particular, offers superior soft tissue differentiation, allowing for the clear identification of lipomatous tissue and precise assessment of the tumor's extension into the thoracic cavity. MRI also provides detailed information regarding the tumor's relationship with surrounding structures, which is vital for preoperative planning.[9]

Treatment Approaches

Surgical excision remains the treatment of choice for giant parietal wall lipomas, especially those with intrathoracic extension. This procedure is typically performed under general anesthesia, and careful dissection is required to avoid damage to surrounding vital structures such as the lungs and large vessels. In pediatric patients, surgery must be approached with additional caution due to the risks of anesthesia and potential for postoperative complications, such as wound infection or respiratory compromise.[10] While excision is generally well-tolerated, the benefits of complete tumor removal must be weighed against the risks of intrathoracic involvement, which may require more complex surgical techniques to ensure complete excision without causing harm to adjacent organs.

Prognosis

The prognosis for patients undergoing surgical excision of giant parietal wall lipomas, including those with intrathoracic extension, is generally favorable. Recurrence rates are low, especially when the tumor is completely excised with clear margins.[11-26] Long-term follow-up is recommended to monitor for any recurrence, although the incidence of recurrence after complete excision is rare. Postoperative recovery is typically uneventful, and most patients can resume normal activities within a few weeks. The key to favorable outcomes lies in early diagnosis, precise surgical excision, and careful monitoring during the postoperative period.

CONCLUSION

This case report highlights the rare occurrence of a giant parietal wall lipoma with intrathoracic extension in a pediatric patient. While lipomas are common benign tumors, their extension into the thoracic cavity is exceptionally uncommon and presents unique clinical challenges. Early detection and precise radiological evaluation are crucial for successful surgical excision, which remains the preferred treatment approach. The patient in this case had an excellent postoperative recovery with no recurrence or complications. A multidisciplinary approach is essential for the optimal management of such cases, ensuring complete tumor removal and minimizing risks to vital thoracic structures.

Recommendations

Consider early imaging for any suspicious chest wall mass to assess size, location, and extension.

Involve pediatric surgeons, radiologists, and anesthesiologists for optimal surgical planning and postoperative care.

Schedule long-term follow-up visits to monitor for recurrence, especially in pediatric patients with giant lipomas.

Acknowledgment

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