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Cash Report

An atypical case of severe obesity, right hemi-diaphragmatic elevation and mediastinal liposarcoma

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ABSTRACT

A giant anterior mediastinal malignancy coexisting with super-super obesity is a conundrum which presents a surgical management dilemma. We present a 29 year old female with a body metabolic Index (BMI) of 63.1 and an incidental chest x- ray finding of elevated right hemi-diaphragm during routine clinic visit. Imaging revealed a giant anterior mediastinal mass and radiography-guided biopsy showed a liposarcoma. She underwent a laparoscopic gastric bypass with significant weight loss following which she underwent a complete resection of the mass at a Body mass Index of 49.2. She is recurrence free one year post resection.

Keywords: Mediastinal, Liposarcoma, Gastric bypass, Obesity, Sternotomy

INTRODUCTION

This case represented an extremely unusual situation in which our patient presented with two life - threatening illnesses – a giant mediastinal malignancy and severe obesity (B.M.I over 60 kg/m2). We achieved a successful outcome via a multimodality approach involving bariatric surgery, anesthesia and the thoracic surgery.

CASE REPORT

29 year old woman of Hispanic origin with a BMI of 63.1 residents in New York City presented at our facility with an interest in bariatric surgery. Comorbidity at presentation was obstructive sleep apnea. No history of diabetes, smoking or alcohol use. Vital signs at presentation were all within normal limits. On pulmonary examination, breath sounds were decreased basally. The chest radiograph done revealed a right sided elevation of the diaphragm (figure 1). Baseline echocardiogram was normal. Basic metabolic panel and complete blood count was normal. Elevated cholesterol and triglycerides on lipid panel. Thyroid stimulating Hormone was normal at 2.08 uIU/ml and normal thyroid T3 and T4 levels. All tumor marker levels were normal.

A chest tomographic scan revealed a large heterogeneous mass located in the right anterior mediastinum containing predominantly fat and soft tissue component (figure 2 and figure 3). There was no evidence of airway involvement. Tumor differentials based on its radiologic features included thymolipoma, liposarcoma or a germ cell tumor. Abdominopelvic CT scan was normal. Percutaneous CT-guided biopsy gave a diagnosis of Liposarcoma - sclerosing variant.

Pre-operative pulmonary function test showed an obstructive picture with decreased FEV1 and FVC. The patient underwent a laparoscopic gastric bypass and achieved a successful reduction in her Body mass index

from 63.1 at presentation to 49.1 after four months. A repeat pulmonary function test four months following bariatric surgery showed significant improvement in the obstructive pattern noted on pulmonary function testing.

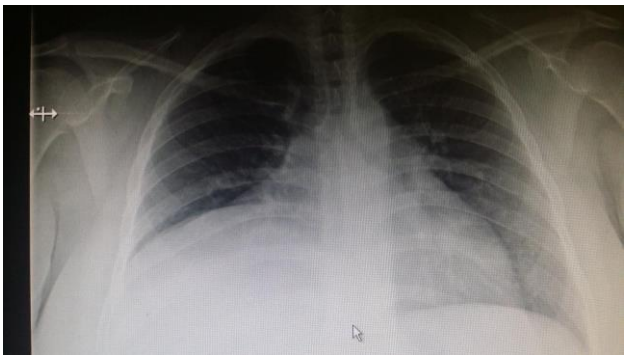

Figure 1: Chest radiograph showing right hemi-diaphragm elevation.

The patient was then scheduled for an elective surgical resection of the mass. She was commenced on aggressive chest physical therapy and incentive spirometry prior to surgery. On the day of surgery, she was placed in the supine position and was intubated with a double lumen endotracheal tube. Access into the chest cavity was via a median sternotomy. Operative findings included a huge anterior mediastinal mass impinging on the right innominate vein, the internal mammary artery, superior vena cava and the pericardium with encasement of the right phrenic nerve and compression of the right lung. The tumor was successfully completely resected with preservation of the right phrenic nerve and involved vascular structures. Cardiovascular and respiratory parameters were stable throughout the entire surgical procedure. Cardiopulmonary bypass was not indicated.

Figure 2: Coronal slice of CT scan showing mediastinal tumor.

Postoperatively, she was stepped down to the floor from the Surgical Critical Care Unit second post-operative day, chest tubes were removed on fourth and fifth post-operative day respectively and was discharged on the sixth post-operative day.

The resected tumor was 28.0 x 19.0 x 8.0 cm and weighed 1840 grams. Pathology revealed a well differentiated liposarcoma, sclerosing variant, with cellular spindled areas. Chemo-radiation was not indicated as per oncology. She is alive and recurrence free one year post surgery with a normal follow up chest x- ray (Figure 3).

DISCUSSION

This case report represents a rare situation of coexistent severe obesity and mediastinal malignancy identified by diaphragmatic elevation on chest radiography.[1] No reports was found in the literature on obese patients and mediastinal masses.

Elevation of the hemi-diaphragm on chest x ray may be congenital – as seen in diaphragmatic eventration or may be an indicator of phrenic nerve dysfunction.[2,3] A chest tomographic scan may show evidence of a thoracic mass with phrenic nerve tumor compression by tumor. Complete radiographic resolution is usually achieved following surgical resection of the tumor if the phrenic nerve is preserved.

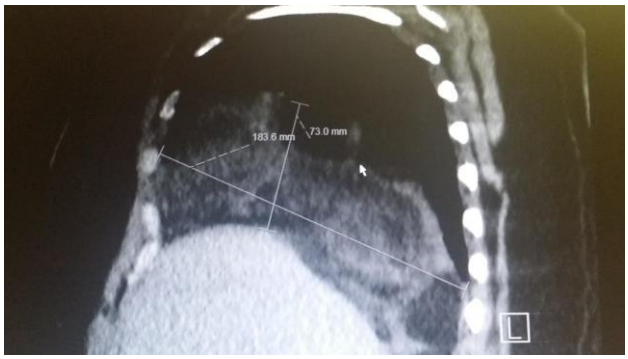

Figure 3: Sagittal slice of chest CT scan showing mediastinal tumor.

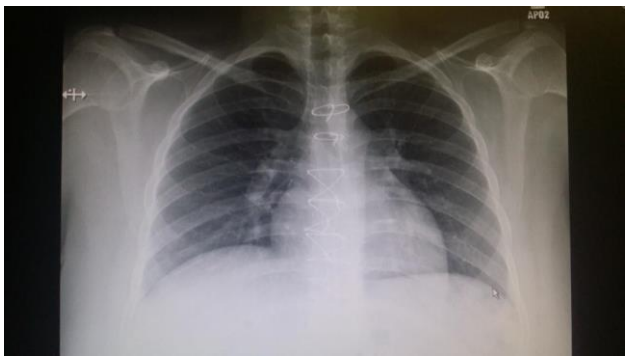

Figure 4: Normal chest radiograph following tumor resection.

Anterior mediastinal liposarcomas are uncommon and make up less than 1% of all mediastinal tumors.[4] These tumors may be of thymic origin especially when found in children. Approximately 85% of patients with liposarcoma of the thoracic cavity have complaints pertaining to the tumor, while 15% are asymptomatic and present incidentally on chest radiography.[5]

Surgical resection is the mainstay of anterior mediastinal tumors and a median sternotomy is regarded as the conventional approach to surgical resection of anterior mediastinal masses. Seong et al found out that robotic resection of anterior mediastinal masses was associated with less haematocrit drop and was linked to shorter hospital stays. They recommended that robotic - assisted surgery be utilized in the surgical management of small - sized anterior mediastinal masses.[5]

Careful anesthetic management of the obese patient with a pulmonary pathology plays an immense role in the surgical outcomes of these patients. Their multiple comorbidities such as metabolic syndrome and obstructive sleep apnea puts them at high risk of airway obstruction and cardiovascular collapse during Induction of general anesthesia and intra-operatively (6 - 8). Post operatively, they are at high risk of pulmonary atelectasis, pulmonary embolism and wound complications. This complication contributes to high rate of adverse outcomes seen in these patients.

Bechard et al aimed to determine the risk of occurrence of intra-operative and post-operative cardiorespiratory collapse in patients with anterior or middle mediastinal masses under anesthesia using objective parameters such as clinical signs and symptoms at presentation, presence of restrictive and obstructive pattern on pulmonary function tests, and CT findings of tracheal compression, pericardial effusion.[6] They found a relatively high incidence of early life threatening post- operative complications in patients with symptomatic patients at presentation, airway compression and pericardial effusion on CT imaging and a restrictive and obstructive picture on pulmonary function testing.

A deliberate delay in resection of the mediastinal tumor was necessary in our case because the urgency to resect a mediastinal malignancy was carefully weighed against the preoperative weight of the patient and its attendant risks; the ability of the patient to tolerate surgery and the anesthetic and cardiopulmonary risks involved.[7]

We were able to achieve a significant reduction of her body metabolic index and improvement of her obstructive sleep apnea through gastric bypass. We optimized her post-operative recovery by improving preoperative pulmonary function and ensuring aggressive incentive spirometry and ambulation after surgery

CONCLUSION

This case report represents an atypical situation of severe obesity coexisting with an anterior mediastinal malignancy. A Multidisciplinary approach involving the bariatric surgeon, anesthetist and thoracic surgeon was successfully utilized in this case.

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