

Intrathoracic Xanthoma Mimicking Lung Cancer in a Patient with Familial Hypercholesterolemia Type II: A Case Report

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ABSTRACT

Xanthomas are benign soft-tissue lesions commonly occurring on the skin, subcutis, or tendon sheaths of patients. The lung and thoracic cavity is a rare location for xanthomas. We present a 39-year-old woman who was admitted to our hospital with complaints of dyspnea, cough, and chest pain. She had a prior diagnosis of type II familial hypercholesterolemia. Chest x-ray film and computed tomography scans revealed a large tumor-like mass in the right hemithorax. Thoracic mass and narrowed tracheal segments were removed using cardiopulmonary bypass. Histopathologic findings were consistent with xanthoma.

INTRODUCTION

Familial hypercholesterolemia (FH) resulting from mutations in the low-density lipoprotein-receptor gene is associated with increased risk of premature atherosclerosis and coronary artery disease [Brown 1986]. FH is characterized by foamy histiocytic accumulation in cutaneous or tendinous xanthomas and within atheromatous lesions. The possibility of foamy cell accumulation should be considered in the differential diagnosis of patients with these disease entities who present with space-occupying lesions. Xanthomas are benign soft-tissue lesions commonly occurring as nodules on the skin, subcutis, or tendon sheaths in hyperlipidemic patients [Inazu 1999]. These xanthomas include xanthelasma, tuberous xanthoma, tendon xanthoma, and eruptive xanthoma. We report a case of a huge xanthoma in the thoracic cavity of a patient with FH type II.

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CASE REPORT

A 39-year-old woman was admitted to our clinic with complaints of dyspnea, cough, and chest pain. She had a prior diagnosis of type II FH. She had been operated on 8 years before in another institution for a thoracic mass that had been diagnosed as xanthoma. In her physical examination a few tendinous xanthomas were observed. Her chest x-ray showed a mass-like shadow on the right side and focal anteromedial elevation of the left diaphragm. Computed tomography scans revealed a tumor with a low density in the right upper lung field that extended into the thoracic cavity and partially into the carina, with a compression on either the vena cava superior or right pulmonary artery (Figure 1). Magnetic resonance imaging features of the patient's right hemithorax were a hypodense solid mass filling the upper and middle zones. The mass was 10 × 9 × 9 cm in size. The right lung was totally atelectatic and a shift from the right hemithorax to the left was present. Radiologic findings were found to be suspicious for a malignant neoplasm. Fiberoptic bronchoscopy showed the narrowing main bronchus close to the bifurcation and total obstruction of the right main bronchus. Fine-needle aspiration from the mass showed blood cells, and it was nondiagnostic.

At surgery, standard median sternotomy was performed. Preliminary exploration confirmed the presence of a huge mass in the right thoracic cavity (Figure 2). Intraoperative frozen-section revealed histiocytic reaction and cholesterol clefts consistent with xanthoma. The right lung was about 3 × 5 × 4 cm in size. After standard aortobicaaval cannulation, normothermic cardiopulmonary bypass was initiated due to severe tracheal stenosis. The trachea was incised vertically, and the incision was extended from 1 cm above the carina. The obstructed tracheal area (about 1.5 cm) was excised. The xanthomatous mass and the narrowed tracheal segments were totally excised. Unfortunately, the remaining trachea was involved partially and lipid deposits in the membranous region could not be removed completely. Anastomotic sides of the trachea were thin, sharp, and rigid, and the tissue character was unclear because of lipid exposure. Tracheal anastomosis was performed with nonabsorbable sutures in a continuous fashion.

Yellow-brown solid tissue fragments measuring 200 g, an atelectatic segment of lung tissue, and a narrowed tracheal segment were received for histological examination following

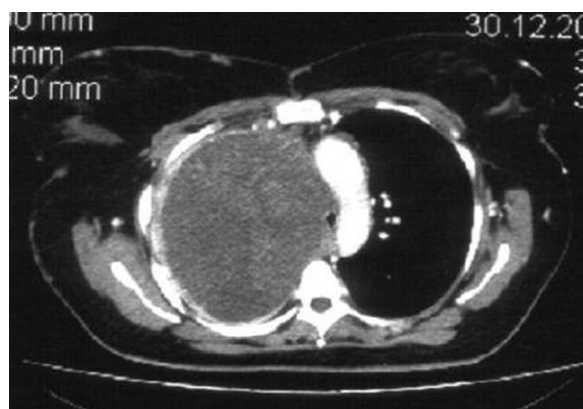


Figure 1. Computed tomography scan showing a markedly enlarged thoracic mass.

the surgical excision. Microscopic examination showed a partially encapsulated lesion composed of abundant cholesterol clefts, lipid-laden macrophages, and histiocytic giant cells. The lesion was located in the pleural cavity, adjacent to the lung, in continuum with the pleura. Accumulation of lipid-laden macrophages and extracellular cholesterol was present in the trachea, within the mucosa, and around the cartilage (Figure 3). Neoplastic growth was not present in any of the submitted tissues; histologic findings were interpreted as ectopic xanthoma.

The postoperative course was complicated by pneumonia in the left side 1 week after the operation. Reintubation was performed but the airway pressure could not be kept below 40 mmHg because of pulmonary resistance. Higher airway pressure and infection caused tracheal anastomotic leakage and emphysema. The patient underwent a reoperation. Tracheal reanastomosis was secured by a muscle flap that was wrapped around the sutures and fixed by fibrin glue.

Unfortunately, high airway pressure was recorded 10 days after the operation. Deep hypoxemia and severe acidosis was

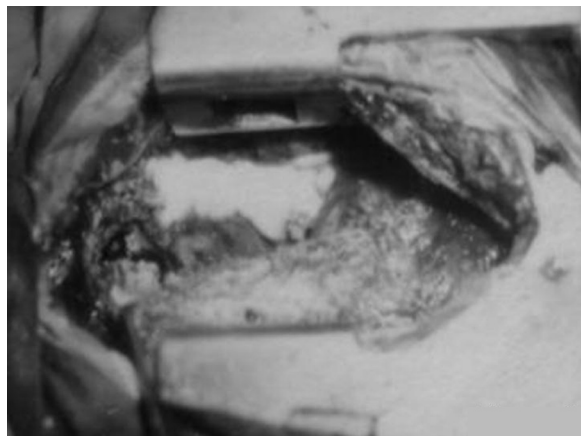


Figure 2. Surgical area showing part of the lipid deposit in the right hemithorax.

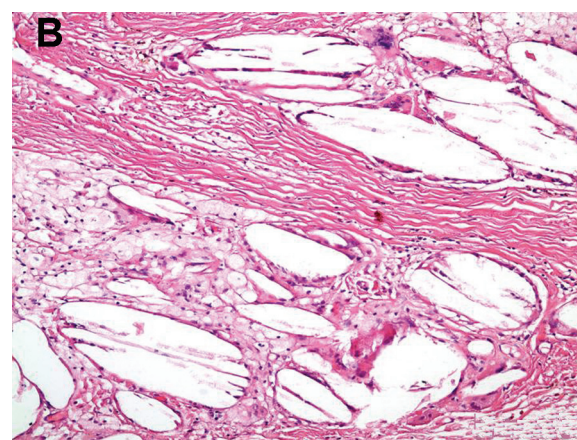
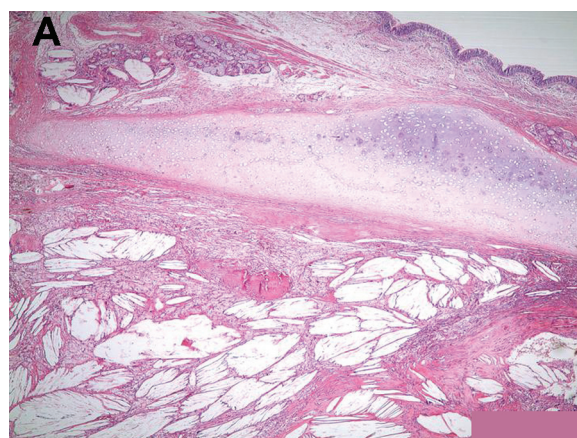


Figure 3. A, Xanthoma infiltrating the tracheal segment (hematoxylin and eosin stain, original magnification $\times 40$). B, Xanthoma composed of foamy histiocytes and cholesterol clefts surrounded by giant cells (hematoxylin and eosin stain, original magnification $\times 200$).

noted. The body temperature was 39.5°C and the blood cell count was $30 \times 10^3/\text{mL}$. She had a diagnosis of mediastinitis according to the result of the chest computed tomography scan and the clinical parameters. She died due to septic complications and low cardiac output on postoperative day 15.

DISCUSSION

Xanthoma is a benign proliferative lesion. It commonly occurs on the skin, subcutis, or tendon sheaths of hyperlipidemic patients. It is not a true neoplasm, a fact that is suggested by its formation in response to hyperlipidemia and its tendency to occur at easily injured sites [Inazu 1999], which are more likely to be at the elbows, buttocks, or patellar and Achilles tendons. Microscopically, it is composed of foamy histiocytes, cholesterol clefts, giant cells, and reactive fibrosis in various proportions. They arise in areas of increased vascular permeability caused by either minor trauma or vasoactive compounds. The composition of a xanthoma is highly variable. The appearance often differs from one case to another [Bertoni 1988; Inazu 1999]. Once the lipids

have egressed into the surrounding connective tissue they are phagocytosed and partially digested by macrophages, creating "foamy cells." Despite the large number of people who suffer from hyperlipidemia, only a minority will develop cutaneous xanthoma [Robertson 1995]. Xanthomas are a manifestation of types I and II hyperlipoproteinemia, diseases of lipid metabolism that can result in death from cardiovascular causes if left unrecognized or untreated.

Occasionally, patients may be totally asymptomatic. Generally, this pathology is found incidentally during a routine physical examination or in the process of unrelated clinical problems [Bertoni 1988]. Because xanthomas are benign lesions, a number of cases do not need surgical treatment. Frequently, fine-needle biopsy is the main choice for histologic identification. The indications for surgical excision are decided by cosmetic deformity or local symptoms. Sometimes the lesion can appear extensive and aggressive or it may exhibit an unusual appearance, suggesting a malignant tumor.

The most common presenting symptom, regardless of the site of involvement, is pain. In our case, the primary complaint was chest pain and dyspnea. In our case, airway symptoms and tracheal stenosis were severe. Radiologic findings were highly indicative of a malignant thoracic neoplasm, so we decided to perform surgical treatment in this case.

Thoracic localization of xanthoma is a benign and curable lesion with an excellent prognosis; however, thoracic localization of xanthoma is uncommon and its diagnosis is difficult in some cases. We described an extremely rare case of thoracic xanthoma that was found in an uncommon location. It caused right autopneumectomy and severe tracheal stenosis. Most cases with xanthoma are managed medically without operation. We believe that when the surgical treatment is decided complete excision should be made. Unfortunately, in our case, right autopneumectomy as a cause of life-threatening complication had been diagnosed

preoperatively. We believe that the absence of normal tissue character in the anastomotic sides of the membranous part of the trachea that was left after resection affected the postoperative course inversely. The imaging findings of xanthoma in an extreme location may cause it to be mistaken for a malignant neoplasm. As previously reported, masses that prove to be typical xanthomas on histopathological and chemical examinations may simulate neoplastic growths [Bhattacharyya 1980; Lugo-Somolinos 2003].

In conclusion, we have described the poor clinical progress and the management of thoracic xanthoma in a young woman. The rare case showed that lipid accumulation in the thorax and lipid infiltration to the mediastinum may be life-threatening complications. Ectopic xanthomas in the thorax should be considered in the differential diagnosis of masses in patients with FH.

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