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CASE REPORT

Giant mediastinal thymolipoma in a patient with Gardner's syndrome

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Abstract

Gardner's syndrome is a hereditary disorder inherited as an autosomal dominant with high penetrance and variable expression that is caused by a mutation of the adenomatous polyposis coli gene. It is characterized by gastrointestinal polyps associated with multiple osteomas, dental anomalies, and skin and soft tissue tumors. We present a case of 30-year-old female patient with Gardner's syndrome who presented with a giant mediastinal thymolipoma. The tumor was completely excised through a bilateral posterolateral thoracotomy. There was no recurrence after 20 months of follow-up. We therefore suggest that physicians who regularly treat patients with Gardner's syndrome carefully examine for thoracic manifestations.

Introduction

Gardner's syndrome is a rare autosomal dominant disorder with a high degree of penetrance and variable expression that is caused by a mutation in the adenomatous polyposis coli (APC) gene located on chromosome 5q21-22.[1] Gardner and Richard first described this condition in the early 1950s.[2] It is characterized by gastrointestinal polyps associated with multiple osteomas, dental anomalies, and skin and soft tissue tumors.[3] The syndrome may present anytime between the ages of two months and 70 years with a variety of symptoms, either colonic or extracolonic. Only a few cases of Gardner's syndrome have been reported worldwide in recent years. We report a rare case of giant mediastinal thymolipoma in a patient with Gardner's syndrome. To the best of our knowledge, thymolipoma occurring in a patient with Gardner's syndrome has not previously been reported.

Case report

A 30-year-old female presented to our hospital complaining of shortness of breath on exertion for approximately three years and exacerbation for three months. Her medical history revealed that she was diagnosed with Gardner's syndrome eight years earlier. This diagnosis was confirmed by specific genetic tests for APC mutation performed at Peking University Shenzhen Hospital. There was no relevant family history for adenomatous polyposis. Multiple swelling was found on her occipital, face, neck, right side of the back, and buttock when she was 13 years old, gradually enlarging since then. She underwent a biopsy 10 years ago and histopathologic evaluation of the biopsy specimen confirmed a diagnosis of neurofibroma. All tumors were completely excised in the following years.

On physical examination, the right lung field was dull to percussion with decreased breath sounds on auscultation. In addition, multiple lipomas were found in her back, buttock and legs. The remainder of the physical examination was unremarkable. No relevant abnormalities were noted on the hematologic or biochemical studies. Microbiologic analysis of the sputum was negative. A gastroscopy and colonoscopy were performed and revealed normal findings. A thorax roentgenogram showed a large mass in the anterior mediastinum with small lung volumes. Pulmonary function tests

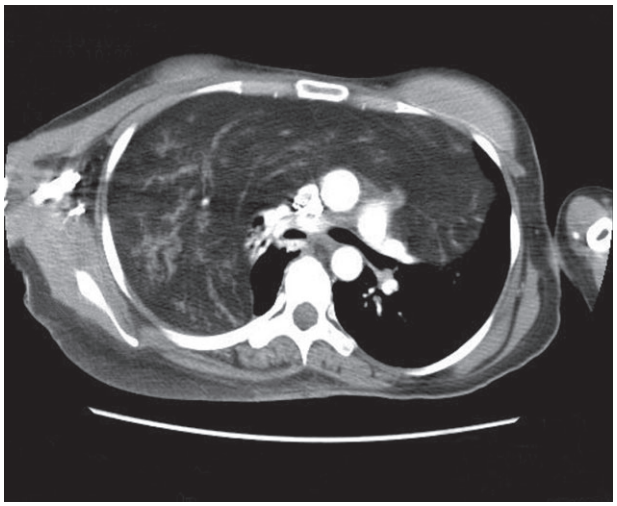

Figure 1 Computed tomography scan (mediastinal window) confirmed the giant mass occupying the entire right hemithorax and extending anteriorly into the left hemithorax.

showed a decrease in forced vital capacity (24% predicted) and forced expiratory volume (22% predicted) with a total lung capacity of only 37%. Chest computed tomography (CT) revealed a large fat containing mass occupying almost the entire right hemithorax and extending anteriorly into the left hemithorax with a clear boundary, which resulted in lung collapse and mediastinal shift (Fig 1). The patient confirmed that the mass had been present for a period of more than six years. An evaluation for distant metastases using positron-emission tomography–CT was negative.

Surgical exploration was performed via a bilateral posterolateral thoracotomy and revealed a large, smooth, yellow, non-infiltrating encapsulated mass. The mass occupied approximately 80% of the right and 50% of the left pleural cavity, resulting in marked compression of both lungs. The mass was removed in two parts because of its large size. A $20 \times 17 \times 15$ cm mass was first excised by a left chest posterolateral incision, followed by the remaining mass measuring $28 \times 25 \times 17$ cm by a right chest posterolateral incision (Fig 2a). The two masses weighed 4150 g. Histological examination showed that the tumor was predominantly composed of mature adipose tissue intermixed with septa of thymus tissue containing lymphocytes and Hassall's corpuscles (Fig 2b). The final diagnosis was thymolipoma. The patient was discharged 15 days later in excellent condition (Fig 3). There was no recurrence after 20 months of follow-up.

Discussion

A diagnosis of Gardner's syndrome can be made by genetic testing for gene mutations or by the demonstration of multiple or diffuse intestinal polyposis, osteomas, and soft tissue tumors. The syndrome may present at any age from two months to 70 years with a variety of symptoms, either colonic or extracolonic. However, extra-intestinal manifestations frequently precede gastrointestinal symptoms for many years, as observed in our case and previous reports.[4] In the present case, the patient was 30 years old and had no intestinal symptoms. Most patients have a positive family history, whereas about 30% of cases can present with a new dominant mutation, with the patient being the first affected member of their

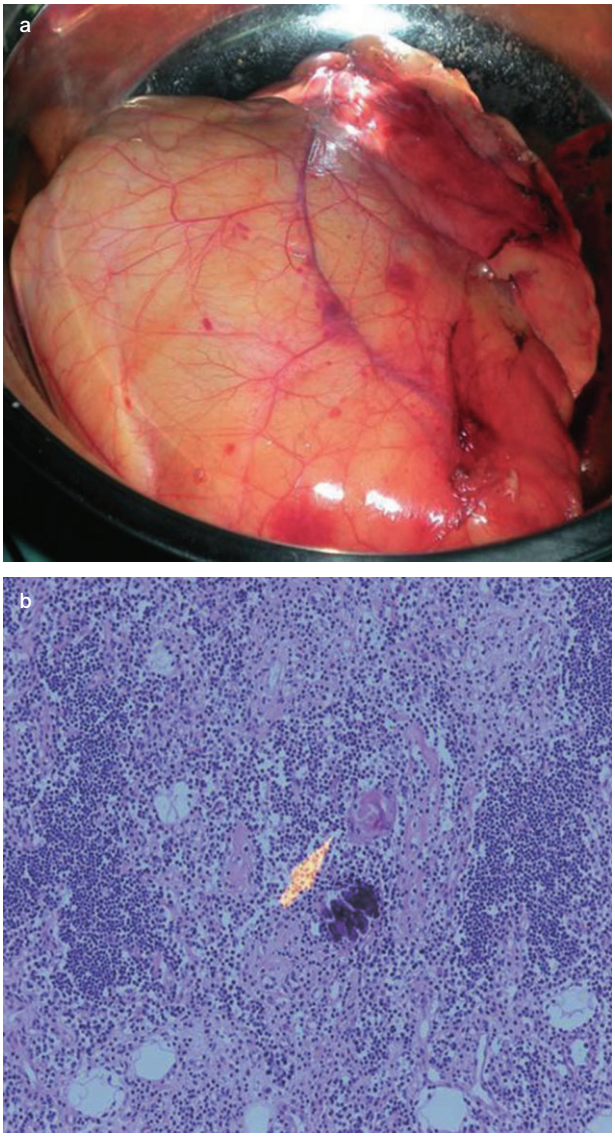

Figure 2 (**a**) Macroscopic investigation of part of the excised mass showed that it was basically composed of adipose tissue and covered by a thin translucent capsule. (**b**) Microscopic investigation showed the tumor was composed of lobules of mature adipose tissue intermixed with septa of thymus tissue containing lymphocytes and Hassall's corpuscles (arrow) (hematoxylin and eosin, ×20).

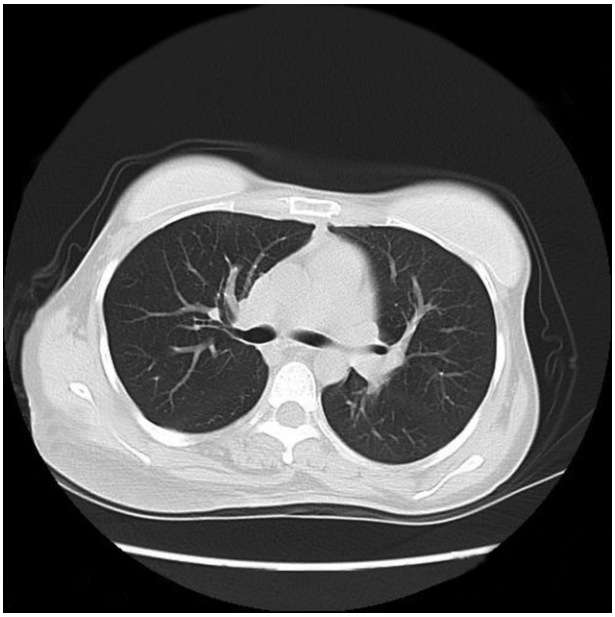

Figure 3 (**a**) A chest computed tomography scan (lung window) reveals that the patient recovered well after resection of the tumor.

family.[5] So far, the patient's family has not presented any signs or symptoms of Gardner's syndrome.[6]

A gastroscopy and colonoscopy were performed, and no polyps were found. Polyps can be found in any part of the gastrointestinal tract from the stomach to the rectum, particularly in the distal colon. They usually emerge in the second and third decades of life, and the lesions have a 100% risk of malignant transformation. In the present case, the patient was 30 years old and had no intestinal symptoms.

The most common cutaneous lesions of Gardner's syndrome are epidermoid cysts and they are usually found on the face, scalp, and extremities. Other skin lesions include fibromas, lipomas, neurofibromas, and leiomyomas.[7] Some cancers are strongly associated with Gardner's syndrome, such as thyroid carcinoma, central nervous system tumors, and cancer of the periampullary duodenum. Adenocarcinoma, hepatocellular carcinoma, osteosarcoma, and chondrosarcoma also have been reported.[8] In our case, multiple neurofibromas and lipomas were the sole manifestations of the disease.

Unlike most patients with Gardner's syndrome who present with gastrointestinal symptoms, our patient presented with multiple neurofibromas and lipomas, as well as a giant mediastinal thymolipoma. To the best of our knowledge, the presence of this disease with such a large mediastinal thymolipoma has not been reported previously. The extracolonic manifestations of Gardner's syndrome may be explained by the variable expression that is caused by the mutation of the APC gene located on chromosome 5q21-22. More than 1400 different mutations of this gene have been identified.[9] The mutated specific area of the APC gene determines the extracolonic manifestations, as well as the number, timeframe, and malignant potential of adenomatous polyps. It has been reported that environmental factors, such as diet, exercise, and smoking play an important role in the pathogenesis of Gardner's syndrome.[10]

Thymolipoma is an uncommon benign tumor of the anterior mediastinum. Despite the proposal of several theories, the pathogenesis of thymolipoma remains unclear.[11] Patients usually remain asymptomatic until the tumor achieves enormous proportions, causing airway and parenchymal compression.[12] The tumor usually attains a huge size, as observed in our case and other previous reports.[13] As a thymolipoma is a benign tumor, the most effective and radical treatment is surgical resection. In our case, using general anesthesia represented a high risk, as the patient had poor pulmonary function. The most critical point is the induction of anesthesia and intubation. Once intubated, respiration must be maintained. If an accident occurs at the induction of general anesthesia, percutaneous cardio-pulmonary bypass system (PCPS) is indicated.

We chose bilateral thoracotomy by posterolateral approach; however, some surgeons prefer a clamshell approach in this situation.[14] A clamshell approach generally allows the best surgical field of the anterior mediastinum and the thoracic cavity. Once the thoracic cavity is opened, the mass effect is reduced immediately, and the possibility of deterioration in respiration and circulation disappears.

Even though no other tumors developed after 20 months of follow-up, the patient should be carefully and regularly followed-up long-term, as there is a constant threat to her life at any age. In addition, physicians who regularly treat Gardner's syndrome should serve as a reminder to loom for thoracic manifestations.

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Disclosure

No authors report any conflict of interest.

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