

serum calcium. Restriction of calcium and vitamin D supplements is sometimes all that is required, although intravenous fluids may be used for more rapid normalisation of serum levels. A variety of other treatments have been used: ketoconazole, hydroxychloroquine, bisphosphonates and corticosteroids [6, 8, 17]. The mechanisms for these therapeutic measures are not fully understood, although corticosteroids are believed to reduce the concentration of 1,25(OH)₂D₃ by inhibiting hydroxylation to this metabolite [16]. Unless absolutely necessary, polypharmacy should be avoided as patients already have a significant medication burden and additional medications may affect compliance. In our case supplement restriction and intravenous hydration was sufficient.

Our case illustrates the infrequently recognised and poorly understood phenomenon of hypercalcaemia in TB. Children with TB are increasingly being tested and treated for vitamin D deficiency. However, there are no clear guidelines for dosage and duration of supplementation, and further studies are needed to address this. It is therefore important to monitor serum calcium and vitamin D levels especially after starting concurrent supplementation and nutrition, and to have a high index of suspicion for hypercalcaemia when presented with gastrointestinal or musculoskeletal symptoms.

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Statement of Interest: None declared.

Provenance: Submitted article, peer reviewed.

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DOI: 10.1183/09059180.00006910

A 69-year-old female with multiple, bilateral pulmonary nodules

To the Editor:

A 69-yr-old post-menopausal female with pulmonary nodules and a diagnosis of lymphangioleiomyomatosis (LAM) confirmed elsewhere was referred to our centre (U.O. di Pneumologia, Ospedale San Giuseppe, Milan, Italy) for further evaluation.

The patient was a nonsmoker and denied any occupational exposures. There was no family history of cancer. She had no history of pulmonary diseases or respiratory symptoms. Her past medical history included systemic hypertension treated with angiotensin converting enzyme inhibitor, hypercholesterolemia treated with atorvastatin, and diabetes mellitus. The patient had

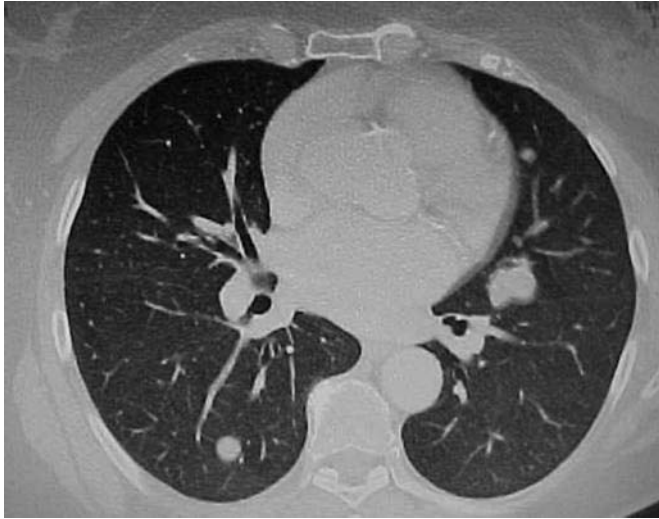


FIGURE 1. Chest computed tomography scan showing multiple, bilateral, well-circumscribed pulmonary nodules.

been well until July 2008 when she was evaluated in another hospital and a breast carcinoma was discovered. Multiple bilateral small nodules of the lung were noted on a chest computed tomography performed at the time of breast carcinoma diagnosis (figs 1 and 2). Fluorodeoxyglucose-positron emission tomography did not disclose pathological uptake of the lung nodules. A wedge resection of the lung was performed. The histological diagnosis was LAM. In October 2008 the patient underwent breast conserving surgery (quadrantectomy) with excision of the lesion in the right breast; the pathological diagnosis was infiltrating ductal carcinoma. She was started on tamoxifen treatment.

The patient was evaluated in our department in March 2009. She was completely asymptomatic with no complaints of shortness of breath, cough, chest pain, fever, chills, night sweats or systemic



FIGURE 2. Another chest computed tomography scan showing multiple, bilateral, well-circumscribed pulmonary nodules.

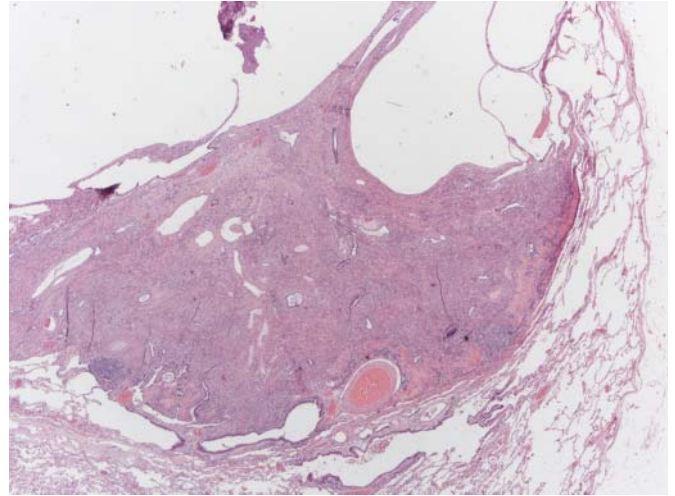


FIGURE 3. Low-power photomicrograph (haematoxylin–eosin stain) of a lung biopsy showing a well-circumscribed nodule; partially solid and partially cystic (upper part). Magnification: 20x.

symptoms. On examination the patient appeared well and her vital signs were normal. Pulmonary and general physical examination was normal. Laboratory tests were all in the normal range. The results of pulmonary function studies (lung volumes and diffusing capacity of the lung for carbon monoxide) were normal. Because a previous diagnosis of LAM had been made, a magnetic resonance imaging scan of the brain and abdomen was performed and meningiomas and renal angiomyolipomas were excluded. Lung computed tomography re-evaluation confirmed the presence of bilateral nodules, radiological aspects not characteristic for LAM. A pathological revision of the pulmonary biopsy was performed and revealed a proliferation of bland spindle cells surrounding benign entrapped bronchioloalveolar epithelium (figs 3 and 4). Immunohistochemically, the spindle cells were positive for desmin and smooth-muscle actin, and negative for HMB-45. Immunoreactivity for both oestrogen and

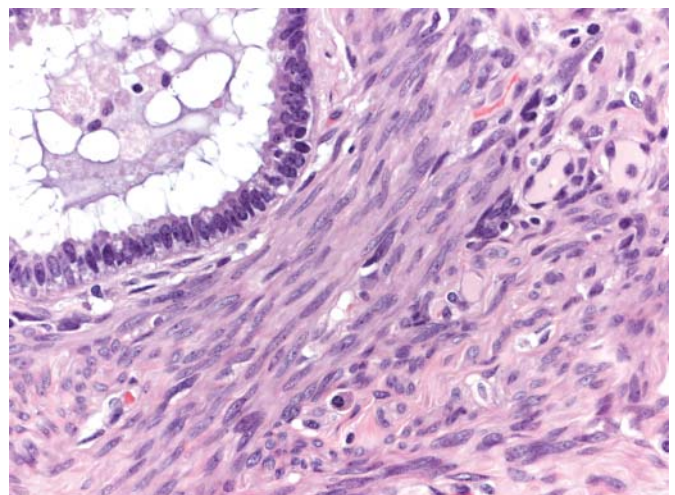


FIGURE 4. High-power photomicrograph (haematoxylin–eosin stain) of a pulmonary nodule in lung biopsy showing bland appearing smooth muscle proliferation with entrapped bronchiolar epithelium. Magnification: 200x.

progesterone receptors was present in the smooth muscle component. Based on these findings, pulmonary benign metastasising leiomyoma (BML) was diagnosed.

A gynaecological examination was performed and multiple uterine leiomyomas were found. A clinical-functional-radiological follow-up was planned. No further treatment was prescribed and the residual nodules have not increased in size during the 18 months of follow-up. The patient remains well and without pulmonary symptoms.

The aetiology of multiple pulmonary nodules is quite complex, with metastatic disease being the most common cause. Other possibilities include sarcoidosis or an inflammatory process, such as fungus, tuberculosis, nocardiosis or septic emboli. However, in asymptomatic patients, further considerations include the presence of rheumatoid nodules, amyloidosis and arteriovenous malformations. The possibility of even less common lesions, including hamartomas and smooth muscle tumours such as leiomyomas, also exists [1]. BML is a rare disorder with ~100 cases reported in the literature. It affects females who have previously undergone hysterectomies or myomectomies due to histologically benign-appearing uterine leiomyomas. Sometimes uterine leiomyoma may be discovered after pulmonary nodules or other extra-uterine lesions [2, 3]. Although leiomyomas are histologically benign, they can metastasise to distant sites, such as lungs, skin, bones, mediastinum, lymph nodes, muscular tissue, heart and retroperitoneum [4]. The lung is the most common site of involvement. It appears that the tumour metastasises to lungs and other extra-uterine tissues *via* haematogenous spread [3].

Patients with pulmonary BML are almost always asymptomatic and, as in this case, the radiographic findings are an incidental finding. The radiographic manifestations are usually well-defined nodules ranging in size from 0.2 to 8 cm which may be unilateral or bilateral, scattered among normal interstitium. Typically these nodules are non-calcified and do not enhance with intravenous contrast administration. Pulmonary nodules usually show little change and may even spontaneously regress. Pathologically, pulmonary BML are composed of benign smooth muscle cells that are similar to uterine leiomyoma [5]. In addition, the pulmonary nodules contain glandular appearing structures that have been shown histologically to consist of alveolar or bronchiolar epithelium. These entrapped epithelial elements are commonly observed in the periphery of the metastatic nodules and, sometimes, can be prominent, causing diagnostic confusion [6]. The clinical course of patients with BML varies and seems to depend on the oestrogen status. BML is usually indolent in post-menopausal females, whereas disease progression has been reported in pre-menopausal females [1, 2]. In addition, the effects of natural hormonal changes in females (pregnancy and menopause) on tumour growth have been described previously [7, 8]. Although there have been reports of patient morbidity and mortality from BML, the clinical course is typically indolent, with patient mortality commonly due to an unrelated disease process. There is no standardised treatment for BML because of the limited number of reported cases. Reported treatment methods include careful observation, surgical resection of pulmonary nodules, hysterectomy and bilateral oophorectomy, progesterone, and medical castration using luteinising

hormone-releasing hormone analogue [9]. The pathogenesis of BML has been a subject of some controversy over the years. Most pathologists now accept these lesions as haematogenous metastases from morphologically benign uterine tumours, although there is a continuum with lesions that show increased mitotic activity. There has been much debate on the true nature of this lesion, a tumour with benign histological features but having biological behaviour suggesting malignancy [10–12]. The differential diagnosis of BML should include metastatic leiomyosarcoma. However, there is still controversy as to where the line between benign and malignant smooth muscle tumour should be drawn histologically. Further research into the basic biology of this neoplasm might reveal that uterine leiomyoma which gives rise to BML is a different subtype to those that do not “metastasise” [10–12]. BML should not be confused with LAM; they are distinct entities. LAM is characterised by the proliferation of smooth muscle cells from lymphatic walls in the lung and lymph nodes. Young females can present with a spontaneous pneumothorax, chylous pleural effusion or progressive dyspnoea. Characteristic imaging findings include hyperinflation and numerous thin-walled cystic spaces. The histological distinction between these two diseases may be difficult in some cases, however, but clinical and radiographic correlation should help establish the correct diagnosis.

Although it is a rare condition, BML should be considered in females with solitary or multiple pulmonary nodules.

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Statement of Interest: None declared.

Provenance: Submitted article, peer reviewed.

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DOI: 10.1183/09059180.00005010

Successful stenting of anastomotic stenosis of the left pulmonary artery after single lung transplantation

To the Editor:

Lung transplantation is an established therapy for a variety of end-stage lung diseases. Successful transplantation improves prognosis and quality of life in most recipients. In the current setting where lung donors are scarce, single-lung transplantation allows for more extensive utilisation of the limited donor organ pool [1]. Although forced expiratory volume in 1 s (FEV₁) recovery is lower and the risk of bronchiolitis obliterans syndrome is higher, single lung transplant recipients still have comparable exercise tolerance and quality-of-life scores when compared to bilateral lung transplant recipients [2].

Fortunately, vascular anastomotic stenoses are an uncommon event following lung transplantation. There are two types of vascular complications: either pulmonary arterial stenosis or pulmonary venous stenosis. The structures affected determine the clinical manifestations: arterial obstruction leads to pulmonary ischaemia and infarction, and venous obstruction leads to pulmonary oedema. The diagnosis should be considered in the presence of unexplained exertional hypoxaemia and persistent pulmonary hypertension. The diagnosis can be confirmed with computed tomography pulmonary angiogram (CTPA) and pulmonary angiography. As the complication is rare there are no clear treatment algorithms. In the very early phase (1 week),

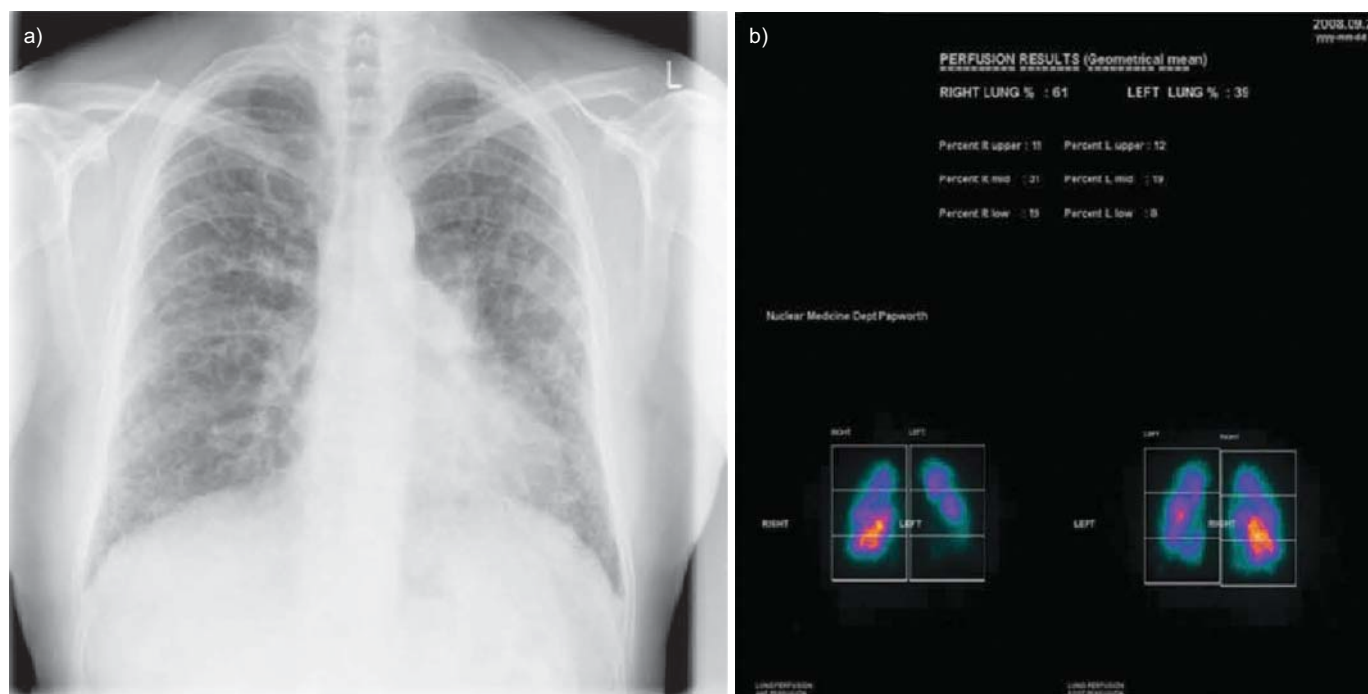


FIGURE 1. Pre-transplant a) chest radiograph and b) perfusion scan.