Respiratory Medicine Extra (2005) 1, 127–130

respiratory MEDICINE Extra

CASE REPORT

# Unilateral hyperlucent lung in a patient with mitral stenosis

**R. Agarwal*, A.N. Aggarwal, D. Gupta**

*Department of Pulmonary Medicine, Postgraduate Institute of Medical Education and Research, Sector-12, Chandigarh 160012, India*

Received 30 June 2005; accepted 19 July 2005

**KEYWORDS**
Unilateral hyperlucent lung;
Macleod's syndrome;
Swyer–James syndrome;
Mitral valve disease

**Summary** Rheumatic heart disease remains a major problem in the developing word, especially in the tropical countries. In this case report we describe a patient with rheumatic mitral stenosis who was referred to our Chest Clinic for exclusion of asthma as she had no improvement following balloon mitral valvuloplasty. Chest radiograph revealed a unilateral hyperlucent lung. Although initially a diagnosis of upper airway obstruction secondary to giant left atrium was thought, further investigations revealed the cause to be MacLeod's syndrome. We discuss the pathological and radiological manifestations of the MacLeod's syndrome, and also discuss the differential diagnosis of unilateral hyperlucent lung, especially in a patient with mitral stenosis. We also highlight the historical controversies associated with the MacLeod's or Swyer–James syndrome.


## Introduction

Mitral valve disease can cause unilateral hyperlucent lung due to major airway compression, both right[1] and left[2] sided secondary to grossly enlarged left atrium which compresses the carina and the major bronchi. MacLeod's or Swyer–James syndrome, originally described on the basis of only radiographic findings, is also known as unilateral (or lobar) emphysema or unilateral hyperlucent lung.[3] Although the syndrome itself may be asymptomatic, the patient may also present with exertional dyspnea, recurrent pulmonary infections and eventual development of bronchiectasis. We describe a case of mitral stenosis with unilateral hyperlucent lung which was diagnosed as MacLeod's syndrome, and discuss the differential diagnosis of unilateral translucent lung. We also summarize the radiological findings of this syndrome and the historical controversies associated with this syndrome.

## Case report

A 40-year old female presented to the outpatient department with complaints of dyspnea on exertion.

*Corresponding author. Tel.: +91 172 2784976; fax: +91 172 2745959.
*E-mail address:* riteshpgi@gmail.com (R. Agarwal).

1744-9049/$ - see front matter © 2005 Elsevier Ltd. All rights reserved.
doi:10.1016/j.rmedx.2005.07.002

There was no history of cough, chest pain, fever, wheeze or hemoptysis. General physical examination was unremarkable. However, physical examination of the cardiovascular system revealed findings suggestive of mitral stenosis. The patient underwent an echocardiography which revealed severe mitral stenosis (valve area 0.8 $cm^2$) with associated pulmonary hypertension and tricuspid regurgitation. She underwent balloon mitral valvuloplasty with an increase in mitral valve surface area (valve area 2.0 $cm^2$) but no improvement in her dyspnea. She was referred to the chest clinic for exclusion of 'asthma'. Physical examination of the respiratory system was unremarkable but the chest radiograph showed characteristic findings in form of unilateral hyperlucent right lung (Fig. 1). Spirometry showed moderate obstruction [$FEV_1$ 1.6 L (48%), FVC 2.76 L (56%), $FEV_1$/FVC ratio 58%] with no significant bronchodilator reversibility. High resolution and contrast-enhanced CT scan of the chest was performed (Figs. 2–4) which showed pulmonary hypertension (main pulmonary artery size equal to that of aorta) and decrease in size of the right pulmonary artery compared to the left (Fig. 2). The lung windows showed decreased attenuation of the whole of the right lung fields with patchy areas of bronchiectasis, decrease in size and number of vessels (Fig. 3); expiratory CT showed air-trapping in the right lung (Fig. 3). Also seen was a giant LA secondary to mitral stenosis (Fig. 4). Fiberoptic bronchoscopy ruled out a major airway compression. The final diagnosis made was MacLeod's syndrome with rheumatic mitral valve stenosis.

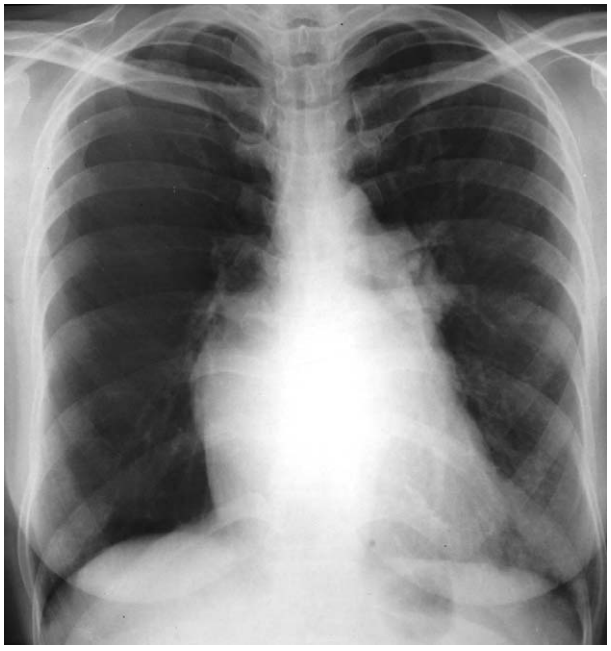

**Figure 1** Chest radiograph shows right-sided hyperlucent lung with decreased vascularity. Also seen are enlarged left and right atria, dilated main pulmonary artery and straightening of the left heart border.

## Discussion

MacLeod's syndrome, also known as Swyer–James syndrome is a condition caused by injury to the immature lung, during the first 8 years of life before the lung has completed its development with damage to the terminal and respiratory bronchioles leading to incomplete development of their alveolar buds.[3] Typically this condition is unilateral and a whole lung may be affected, although changes can be confined to a lobe or a segment. The pulmonary tissue is hypoplastic,

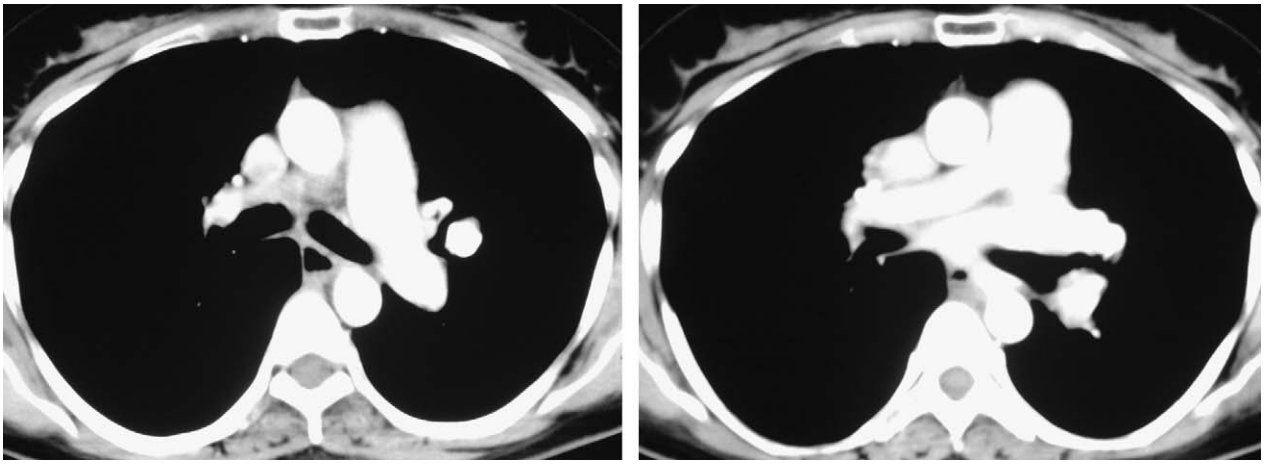

**Figure 2** Contrast-enhanced computed tomography of the chest shows enlarged main pulmonary artery (left) and decreased size of the right pulmonary artery (right) compared to the left.