


Clinical vignette

doi:10.1093/eurheartj/ehi710

Three-dimensional reconstruction of right lung circulation in a patient with isolated absence of right pulmonary artery

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A 51-year-old man was referred to our hospital for recurrences of palpitation due to atypical atrial flutter. The patient reported several episodes of hemoptysis only during the childhood. No other symptom was present. Chest plain radiograph showed a mild displacement of the heart to the right while only a mild enlargement of both atria was observed by echocardiography. Axial images and three-dimensional reconstructions (volume rendering) of lung and mediastinum using 16-slices Multidetector computed tomography demonstrated: (i) the absence of right pulmonary artery (Panels A–C); (ii) a less expanded and dystrophic right lung with evidence of several bullous cavities (Panel A); (iii) the presence of collateral vessels for the right lung mainly arising from a dilated right internal mammary artery and from the celiac trunk. Other smaller vessels came from the aortic arch and descending aorta (Panels B and C).

A ventilation-perfusion scintigraphy (Tc-99 m Pertechnetate Aerosol + Tc-99 m MacroAggregates of human serum Albumin) showed the absence of perfusion in the right lung with almost normal ventilation; a normal ventilation and perfusion was found in the left lung (Panel D).

Catheter ablation of a left atrial flutter was successfully performed. Since there were no other symptoms, we decided to carefully follow this patient and not perform any more intervention at that time.

Panel A. Multidetector computed tomography axial image demonstrates the absence of right pulmonary artery and right lung dystrophy. Panels B and C. Multidetector computed tomography volume rendering reconstructions (Panel B: antero-posterior view; Panel C: right postero-lateral view) show the presence of collateral vessels for right lung arising from: (i) a large right mammary artery (white arrow); (ii) the celiac trunk through an infra-diaphragmatic vessel (red arrow); (iii) the aortic arch and descending aorta through several small peri-bronchial arteries (arrowheads).

Panel D. Ventilation-perfusion scintigraphy (Tc-99 m Pertechnetate Aerosol + Tc-99 m MAA). The ventilation examination of both lungs (Sections a and b) shows a mild reduction of activity at the third medium of the right lung. Homogeneous distribution of aerosol was seen in whole left lung and in the remaining right lung. The perfusion examination (Sections c and d) shows only a faint amount of activity in the right lung while a homogeneous tracer distribution in left lung is detected.