Picture Quiz - Answers

A Chest X-Ray causing confusion

T Novak & C Strait

Answers

Question 1

The Chest X-Ray (Figure 1) shows right unilateral pulmonary oedema with small bilateral pleural effusions. Unilateral pulmonary oedema can easily be mistaken for other pathologies such as pneumonia or pulmonary haemorrhage or even malignancy.

In our patient, a CT-scan (Figure 2) confirmed that there was no underlying lung cancer or pulmonary embolism. The patient was subsequently given intravenous diuretics and a further Chest X-ray three days later showed resolution of the right lung infiltrate confirming the diagnosis.

Figure 2. CT chest

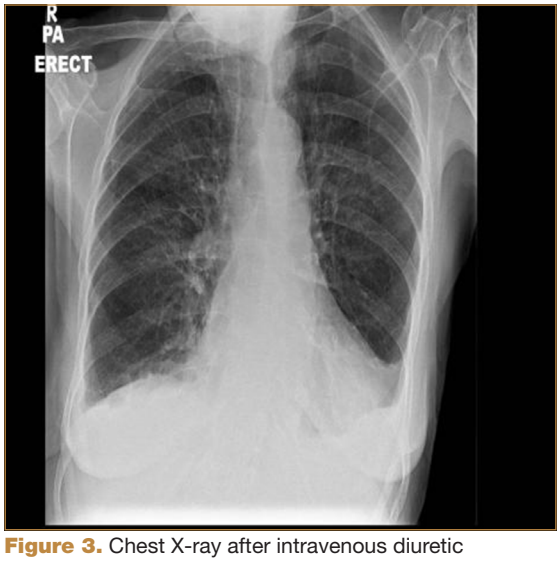

Figure 3. Chest X-ray after intravenous diuretic treatment

Question 2

The presence of a pansystolic murmur radiating to the axilla indicates the cause is mitral regurgitation. An echocardiogram (Figure 4) confirmed that the patient had severe mitral regurgitation with preserved left ventricular systolic function.

About 2% of cardiogenic pulmonary oedema is unilateral and usually due to severe mitral regurgitation.[1] The right upper lobe is the most common site. The mechanism is thought to be increased hydrostatic pressure exerted by a jet of mitral regurgitation impacting predominantly on the right superior pulmonary vein.[2]

Other explanations of why unilateral cardiogenic pulmonary oedema usually affects the right upper lobe include left sided cardiac enlargement impeding blood flow to the left lung and greater lymphatic drainage in the left lung via the thoracic duct (which drains into the left subclavian vein).[3]

Question 3

Causes of unilateral pulmonary oedema can be divided into those due to ipsilateral pathology and those due to reduced perfusion in the contralateral lung (Table 1).[4]

A common cause of ipsilateral unilateral pulmonary oedema is re-expansion pulmonary oedema due to removal of pleural fluid by thoracocentesis. Management is generally supportive with oxygen and sometimes non-invasive or mechanical ventilation rather than diuretic treatment.[5] Other rarer causes of ipsilateral unilateral pulmonary oedema include the effect of gravity in dependent lung in ventilated or immobile patients and pulmonary vein occlusion.

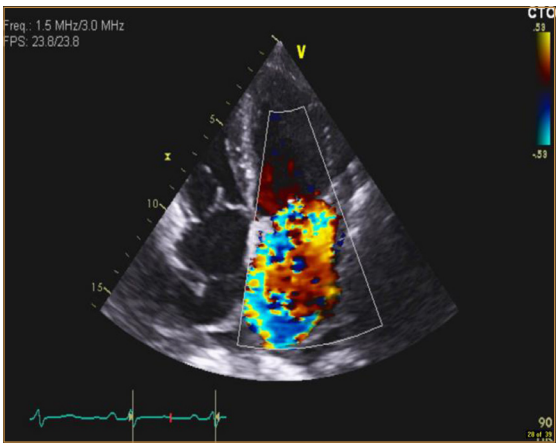

Figure 4. Echocardiogram four chambers view with colour flow Doppler showing a jet of mitral regurgitation reaching the upper right pulmonary vein

Timea Novak
Specialty Doctor in Acute Medicine
Great Western Hospital
Swindon
Severn Deanery

Catherine Strait
MRCP
Consultant in Acute Medicine
Great Western Hospital
Swindon
Severn Deanery

Correspondence
Timea Novak
Specialty Doctor in Acute Medicine
Great Western Hospital
Swindon
Severn Deanery
Email: t.novak@nhs.net

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Contralateral cardiogenic pulmonary oedema can occur if there is reduced perfusion in one lung limiting the formation of pulmonary oedema on one side but not the other. Examples include patients with unilateral hypoplasia of the pulmonary artery, pulmonary artery compression from aortic aneurysm, or when there are fewer pulmonary capillaries in one lung than the other as can occur in Swyer-James syndrome (unilateral hyperlucent lung syndrome caused by hypoplasia or agenesis of pulmonary arteries) or unilateral emphysema/bullae.

Table 1. Causes of unilateral pulmonary oedema

Ipsilateral
Severe mitral regurgitation
Pulmonary oedema in dependent lung due to the effect of gravity
Pulmonary vein occlusion
Re-expansion pulmonary oedema after thoracocentesis
***Contralateral* (due to perfusion abnormalities in the contralateral lung)**
Unilateral hypoplasia of the pulmonary artery
Swyer-James syndrome
Unilateral emphysema/bullae

Conflict of Interest

Nothing to declare

References

1. Attias D, Mansencal N, Auvert B *et-al.* Prevalence, characteristics, and outcomes of patients presenting with cardiogenic unilateral pulmonary edema. *Circulation.* 2010;**122 (11)**: 1109-15.
2. Miyatake K, Nimura Y, Sakakibara H *et-al.* Localisation and direction of mitral regurgitant flow in mitral orifice studied with combined use of ultrasonic pulsed Doppler technique and two dimensional echocardiography. *Br Heart J.* 1982;**48 (5)**: 449-58.
3. Akiyama K, Suetsugu F, Hidai T *et al.* Left-sided unilateral pulmonary oedema in post infarction ventricular septal rupture *Chest* 1994; **105**:1264-1265
4. Webb WR, Higgins CB. Thoracic Imaging, Pulmonary and Cardiovascular Radiology. Philadelphia: Lippincott Williams & Wilkins, 2005. (2005) ISBN:078174119X
5. Genofre E, Vargas F, Teixeira L *et al.* Re-expansion pulmonary oedema. *J Pneumol* 2003; **29 (2)**: 101-6

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