

## CLINICAL IMAGES

## Cardiac tamponade secondary to tension pneumopericardium from penetrating chest trauma

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Cardiac tamponade secondary to air is rare. Pneumopericardium is most commonly encountered in neonates, often secondary to positive pressure ventilation.<sup>1-3</sup> In adults blunt trauma is the main cause of pneumopericardium. Cardiac tamponade occurs in roughly one-third of such patients.<sup>1</sup>

A 24-year-old man presented to the Tshepong casualty department with a stabbed chest. His vital signs were initially stable. A sucking chest wound of 1 cm diameter on the left parasternal border in the 4th intercostal space and a hyper-resonant left chest with decreased breath sounds were noted. A pneumothorax was clinically diagnosed and an intercostal chest drain inserted. An hour later a chest radiograph revealed a pneumopericardium (Fig. 1). He was haemodynamically stable, the neck veins were not distended, heart sounds were audible, and good peripheral pulses were palpable.<sup>1</sup>

During preparation for insertion of a subclavian central venous catheter to assess for pulsus paradoxus, the blood pressure suddenly decreased to 80/50 mmHg, the neck veins became distended and heart sounds diminished. Cardiac tamponade was diagnosed.

An emergency sternotomy for a suspected cardiac injury was performed under general anaesthesia. There was a pneumopericardium and grade 2 through-and-through injury to the left lung, but the heart was intact. Upon incising the pericardium, air was released and the blood pressure improved to 90/60 mmHg. The lung was repaired, the pericardium closed and a pericardial drain inserted. On discharge from the intensive care unit 24 hours later, there were no signs of tamponade. Recovery was uneventful and follow-up chest radiographs were normal.

### Discussion

Pneumopericardium may occur whenever a communication is established between the pericardium and a source of air. Haemodynamic compromise is related to the quantity of air



Fig. 1. Chest radiograph after insertion of the intercostal drain, displaying a pneumopericardium.

present, the rate of accumulation and the presence of underlying cardiac pathology or injury.<sup>2,4</sup>

The commonest sign of tension pneumopericardium is distant, muffled heart sounds.<sup>2</sup> A rarer, more specific sign is the *bruit de moulin* (mill-wheel murmur). Precordial shifting tympany is another sign.<sup>1</sup> Cardiac tamponade caused by pneumopericardium or fluid has identical signs.<sup>1</sup> Bradycardia may occur, the ECG may show changes consistent with pericarditis or nonspecific ST - T-wave changes, and low-voltage recordings may be noted.<sup>1</sup>

The primary management of tension pneumopericardium is relief of the cardiac tamponade to restore haemodynamic stability.<sup>2</sup> Management options include percutaneous catheter drainage, open drainage by pericardiotomy, or open drainage and repair by sternotomy/thoracotomy.

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