

Spontaneous pneumothorax: Is it under tension?

V J Holloway, J K Harris

Abstract

A diagnosis of tension pneumothorax is usually only considered within the context of trauma, incorrect chest drain insertion or positive pressure ventilation. Four patients are presented who developed spontaneous tension pneumothorax with no precipitating factors. In three of these instances, the diagnosis was only made radiologically and in every case the treating physician was unaware that a spontaneous tension pneumothorax could occur. Previously, emphasis has been placed on tracheal deviation in a tension pneumothorax. However, this is an inconsistent finding as one of the cases highlights. Patients may appear surprisingly clinically well until they decompensate. These cases are highlighted to raise awareness of this potentially life threatening condition. (*J Accid Emerg Med* 2000;17:222–223)

Keywords: spontaneous pneumothorax

Case reports

CASE 1

A 22 year old woman presented with sudden onset of right sided chest pain and dyspnoea. Her only past medical history was mild asthma. On examination, she was speaking full sentences, respiratory rate 24/min, haemodynamically normal and had an oxygen saturation of 97% on high flow oxygen. Of note, her trachea was central. There was clinical evidence of a right sided pneumothorax and no wheeze. A diagnosis of spontaneous pneumothorax was made but a portable chest radiograph showed this to be under tension. Re-assessment confirmed a centrally placed trachea, but apex beat was noted to be displaced to the anterior axillary line on the left and percussion resonance noted over the sternum. Needle thoracocentesis resulted in immediate relief of her dyspnoea. A chest drain was inserted, but she developed a persistent air leak with failure to re-inflate the lung. The patient proceeded to thoracotomy where she was found to have a small apical bulla, which required oversew and pleurectomy.

CASE 2

A 19 year old man developed sudden onset of left sided pleuritic chest pain and dyspnoea while walking uphill. He had no previous medical history and was physically fit. On arrival to hospital his breathlessness had resolved. On examination he was clinically well, respiratory rate was normal, pulse 60, blood pressure 130/70 and oxygen saturation 98% in air. There was no air entry on the left and decreased chest expansion on that side. A diagnosis of simple pneumothorax was made

and a portable chest radiograph ordered. The radiograph showed a left tension pneumothorax with marked mediastinal shift. On re-examination the apex beat was found to be heard maximally over the sternum and on percussion, the mediastinum was shown to be displaced to the right. He remained well until he lay flat for a chest drain insertion, upon which he became breathless and tachycardic. His symptoms settled when he sat up and the chest drain was inserted without difficulty. He was admitted to hospital for three days and made a full recovery.

CASE 3

A 20 year old woman presented to the accident and emergency department in extremis, complaining of right sided pleuritic chest pain and increasing shortness of breath for the past five hours. On examination she was tachycardic, hypotensive and dyspnoeic. Oxygen saturation was 91% on high flow oxygen. Her trachea was deviated to the left and she had decreased air entry and resonant percussion note on the right. A needle thoracocentesis resulted in dramatic clinical improvement. A chest drain was inserted; air and 700 ml of blood drained over the next two hours. Her right lung failed to re-inflate satisfactorily. At thoracoscopy she was found to have longstanding apical adhesions, which had bled as the lung collapsed causing an air leak.

CASE 4

A 45 year old man presented with a three day history of left sided chest pain, cough and dyspnoea. His dyspnoea had significantly increased that morning. On examination he was unwell, tachypnoeic 36/min, pulse 130, temperature 37.9°C and normotensive. His trachea was deviated to the right, he had decreased air entry and resonant percussion note on the left. The patient was sent to radiology by the doctor attending him as he did not believe his own clinical diagnosis of tension pneumothorax, thinking that it was impossible without precipitating trauma. Chest radiography confirmed a tension pneumothorax and on re-examination his apex beat was heard maximally over the sternum. He underwent needle thoracocentesis, which partially relieved his dyspnoea, and chest drain insertion. He made a full recovery.

Discussion

Figures from the USA state an incidence of 8600 cases per year of spontaneous simple pneumothorax,^{1,2} approximately 1–2% of these will be under tension.² Advanced Trauma Life Support (ATLS) teaching has emphasised the importance of tension pneumothorax³ so much

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so in trauma, that its spontaneous occurrence seems to have been forgotten. This diagnosis should be borne in mind even in situations where the patient is clinically well and has signs suggesting a simple pneumothorax alone. Indeed if clinical assessment reveals hyper resonance and decreased air entry, there is likely to be a significant pneumothorax and a more thorough clinical examination to determine tracheal and mediastinal position will identify those patients in whom it is under tension. In addition to the signs of simple pneumothorax, physical examination may demonstrate a deviated trachea and/or mediastinal shift as evidenced by displaced apex beat and resonance over the sternum.

As can be seen from cases 1 and 2, young patients with good physiological reserve may actually appear to be clinically stable, however, they are at risk of sudden deterioration and possible cardiac arrest. In cases 1 and 3, the patient was subsequently found to have previously undiagnosed lung disease; this demonstrates the need for thorough investigation of any underlying cause after treatment of the acute event.

A literature search revealed very little on spontaneous tension pneumothorax in previously well patients.⁴ Most cases involved pre-existing disease or were associated with surgery, intermittent positive pressure ventilation or trauma.

Conclusion

A tension pneumothorax is a clinical diagnosis that should not be overlooked, even in the absence of trauma. The trachea may be central and the patient may appear clinically well at presentation. A high index of suspicion and active confirmation of tracheal and mediastinal position will help confirm the clinical diagnosis of tension pneumothorax. Patients must not be sent for radiology. Immediate needle thoracocentesis and chest drain insertion is the emergency treatment whatever the cause.

Contributors

Holloway and Harris initiated the case report jointly following the presentation of two cases at a training meeting (case 1—Harris, case 2—Holloway). Holloway identified two further cases and conducted a literature search. The discussion and conclusion were jointly written. Harris acts as guarantor for this paper.

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- 3 American College of Surgeons. *Advanced trauma life support manual*. Chicago: ACS, 1997: chapter 4.
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Aorto caval fistula—the “bursting heart syndrome”

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Abstract

Aorto caval fistula is one of the less well recognised complications of abdominal aortic aneurysm seen in accident and emergency departments. It presents in a number of different ways the commonest of which is high output congestive cardiac failure with warm peripheries. Initial diagnosis is based on the index of suspicion of the clinician. However, early diagnosis by the emergency physician and early surgery can markedly improve the patients prognosis.

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Case report

A 79 year old man was seen in the accident and emergency (A&E) department five hours after a brief syncopal episode. He described a sudden onset of fast palpitations, dizziness, nausea, one episode of vomiting, sweating and a “feeling as though his heart was going to burst.” These all subsided spontaneously within five minutes. He was a smoker and was

soon due to undergo an elective graft replacement for a 9 cm abdominal aortic aneurysm (AAA). His main complaint on presentation was lethargy since his earlier “funny turn.”

On examination he was pale but warm and well perfused. His jugular venous pressure (JVP) was increased, he had a pansystolic flow murmur, a tachycardia of 105 and BP 105/55. Abdominal examination revealed a large but non-tender pulsatile mass and a fullness in his right loin. Abnormal investigations included a mild hypoxia on air, an ischaemic ECG with left axis deviation and a mild neutrophilia.

An initial differential diagnosis of (a) arrhythmia, (b) myocardial infarction, (c) leaking abdominal aneurysm was made. Blood was cross matched, a myocardial infarction screen was started, he was put on telemetry and a fluid challenge was performed.

Over the next few hours he became oliguric and shocked with no further evidence of myocardial infarction or arrhythmia. He was therefore taken to theatre for repair of a suspected leaking aneurysm. An aorto caval fistula was surprisingly discovered and successfully repaired along with insertion of an aorto

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