Life-saving pneumoperitoneum

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DESCRIPTION

A healthy 5 year-old girl was admitted to Paediatric Intensive Care Unit with respiratory failure secondary to varicella pneumonitis.

Shortly after arrival, she required manual ventilation with high pressures via an anaesthetic circuit. She was subsequently stabilised on high-frequency oscillatory ventilation. After 36 hours, a routine X-ray revealed free air in the thorax, mediastinum, abdomen and the subcutaneous tissues (figures 1 and 2). She had a distended abdomen and crepitus throughout the torso but remained stable with no increased respiratory or inotropic support required and non-deteriorating blood gases. Clinical surgical review, no lactate rise and ongoing bowel opening all suggested there was no bowel perforation.

Bilateral chest drains were inserted and air aspirated from the abdomen. The air leaks progressively resolved, mechanical ventilation was stopped within a week and the patient made a full recovery.

Pneumoperitoneum is secondary to perforated viscus in 85%–95% of cases.^{1,2} Mechanical ventilation with high pressures and pneumothoraces are two of the most common causes of non-surgical pneumoperitoneum.¹

Various mechanisms are postulated for the development of pneumoperitoneum secondary to

Figure 2 Decubitus radiograph of the chest and abdomen showing the extent of the air leak.

pneumothoraces. Direct passage of air may occur through pleural and diaphragmatic anatomical defects such as the aortic or oesophageal hiatus or congenital defects between the peritoneal and thoracic cavities like the foramen of bochdalek. Alternatively, air may travel via the mediastinum, along perivascular connective tissue or through natural microperforations in the diaphragm.³

We believe that in this case, the transfer of air from the chest to the abdomen prevented the patient developing tension pneumothoraces and a significant clinical deterioration.

Learning points

- ▶ This case highlights the importance of routine X-rays for patients who are ventilated with high pressures.
- ▶ It is also important to recognise non-surgical causes of pneumoperitoneum to avoid unnecessary surgical intervention.

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Figure 1 Radiograph of chest and abdomen showing free air in the thorax, mediastinum and abdomen as well as subcutaneously.

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