

Lesson of the Week

Late appearance of pneumothorax after subclavian vein catheterisation: an anaesthetic hazard

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Preoperative parenteral nutrition is increasingly used for many surgical conditions. The infraclavicular route to the subclavian vein is most often recommended.¹ Pneumothorax is a common complication of subclavian catheterisation, and its detection is of extra importance in patients undergoing laparotomy.

Case report

A 61-year-old woman was admitted with a two-month history of vomiting and weight loss. She was frail and dehydrated, and had an epigastric mass. Barium-meal examination had shown a dilated stomach with antral deformity suggesting a neoplasm. Because of her poor physical condition she was started on parenteral nutrition before operation with a 14-G silicone rubber catheter (Vygon 2180.20) introduced into the right subclavian vein by the standard infraclavicular technique.¹ The catheter was buried in a short subcutaneous tunnel by a modification of the method of Titone *et al.*² Four passes of the needle were made to place the line. A good-quality anteroposterior chest x-ray film in inspiration taken 30 minutes later showed the catheter in an acceptable position. No pneumothorax was shown. After this procedure she complained of mild pain in the tip of the right shoulder.

The diagnosis was confirmed by an uneventful fiberoptic gastroscopy performed the following day under intravenous sedation. After five days of parenteral feeding the catheter clotted and was removed. Because she had continued to complain of discomfort in the shoulder a second chest x-ray film was taken and this showed a small right pneumothorax. Although there was no clinical evidence of an oesophageal perforation a Gastrografin swallow was performed to exclude oesophagopleural fistula due to trauma from the endoscope and was normal. An apical chest drain was inserted before laparotomy to prevent a tension pneumothorax developing during intermittent positive-pressure ventilation. At laparotomy an inoperable gastric carcinoma was found and a palliative gastrojejunostomy performed. Her recovery was uneventful and the chest drain was removed on the second day after operation.

Discussion

Needle damage to the visceral pleura during insertion of a central venous catheter may cause a pneumothorax.³ A routine chest x-ray examination is recommended after such catheter

Pneumothorax commonly develops in patients receiving parenteral nutrition through the subclavian vein and may cause serious complications during surgery.

placements, in part to exclude this complication, but an examination on expiration is seldom specifically advised. When such a pneumothorax does develop it is often small and resolves without chest drainage. A simple pneumothorax may, however, cause considerable cardiorespiratory distress during anaesthesia⁴ and may be converted to a tension pneumothorax by positive-pressure ventilation, with a potentially fatal outcome.³ A pneumothorax was not evident in our patient on the early chest x-ray film, but it developed sufficiently in size, presumably owing to slow leakage from a pleural laceration, to be seen on later radiological examination. Preoperative chest physiotherapy may have encouraged the process. Pneumothorax may therefore be an even more frequent complication of central venous catheterisation than is commonly accepted. Blackett *et al.*⁵ recognised the potential of intermittent positive-pressure ventilation to increase the size of a pre-existing pneumothorax in patients given preoperative parenteral nutrition by the subclavian route. They recommended that all such patients should have a postoperative chest x-ray examination. We think that the dangers of general anaesthesia in the presence of an undiagnosed pneumothorax, coupled with the frequency of this complication of central venous catheterisation, justify a more thorough preoperative assessment.

We recommend that all patients given preoperative parenteral nutrition by means of a centrally placed catheter should have their early "check" chest x-ray taken in expiration and that all such patients should have another chest x-ray taken before surgery to exclude the late development of a pneumothorax.

References

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