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Chest X-rays after central line insertion

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Keywords

Catheterization, central venous catheter, complications, pneumothorax, radiographic decision rule, radiology

Comments

The patients in this study were not an intensive care unit population, nor were they ventilated. Despite this, X-rays identified complications in 14% of cases, in what some may consider to be a relatively easy procedure. In the light of this evidence, chest X-rays should continue to be performed in all patients undergoing CVC insertion.

Introduction

Traditional teaching advises that a chest radiograph should be taken after insertion of all central venous cannulae (CVCs). This is to ensure correct positioning of CVC (tip within superior vena cava) and to exclude complications such as pneumothorax. However, it may be that some CVCs inserted by skilled operators are associated with such a small incidence of complications that exposure to X-rays for the chest radiograph may be deemed unnecessary.

Aims

To determine whether clinical features could be used to decide prospectively whether a subgroup of internal jugular CVCs are correctly positioned and complication free and thereby avoid the need for routine post-procedural chest radiographs in selected patients.

Methods

This was a prospective cohort study of 107 consecutive patients, who presented to the CVC insertion team of a tertiary care teaching hospital. No patients requiring mechanical ventilation were included. Following internal jugular CVC placement, the physician who had inserted the CVC completed a questionnaire, which was designed to identify any potential complications thus enableing a decision as to whether to X-ray the patient to be made. Questions included: operator experience, patient characteristics, number of needle passes, resistance to wire advancement or to port flushing.

Results

In 46 cases, the questionnaire highlighted potential complications or malposition and so the decision was taken to X-ray the patient. Complications were confirmed in seven of these cases. In the 61 cases where X-ray was not felt to be indicated, nine complications were found (all malposition of CVC).

Discussion

Although CVC insertion is a safe procedure when performed by a skilled operator, there is a 14% incidence of catheter malposition, which is not reliably identified by clinical factors. Chest radiographs are, therefore, necessary to confirm correct position.

References

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