

RIGHT ENDOBRONCHIAL INTUBATION: A COMPLICATION OF TRANSFERRING VENTILATED PATIENTS

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Transferring patients who are ventilated via an endotracheal tube, on inotropic support and being invasively monitored has potentially serious implications. The case presented here shows one complication with classical clinical and radiological features.

CASE REPORT

A 75 year old lady was admitted to the intensive care unit (ICU) with pancreatitis following endoscopic retrograde cholangio-pancreatography. She developed severe multi-organ dysfunction and required cardiovascular inotropic and respiratory ventilatory support.

Her condition deteriorated as demonstrated by a high temperature and white cell count, increasing oxygen requirements and inspiratory airway pressures and abdominal distention.

A CT scan of her abdomen was indicated to define the extent of her pancreatic disease. She was transferred on a hospital trolley to the scanner room and from the trolley onto the scanner table. She was hand ventilated with a self-inflating bag with added oxygen during these manoeuvres and all the infusions of sedative and inotropic agents and their infusion pumps were transferred as well. She was monitored with a "portable" monitor giving continuous readings of ECG, oxygen saturation, arterial and central venous pressures.

During the period the ventilation was managed by using a portable oxygen-driven ventilator ((Pneumopac). There was no significant change in physiological parameters while this transfer and scan were being performed.

After the scan, the patient was put back onto the hospital trolley along with all the infusions and monitoring apparatus and taken back to the ICU.

Once back on the unit and put onto her bed she was reattached to the intensive care ventilator without changing any of the ventilatory settings. It was noted at this time that her oxygen saturation had fallen.

On examination, the patient was obviously hypoxic with a deterioration in her colour and cardiovascular status. Her chest movements were thought to be reduced on the left and there was slight reduction in the percussion note and breath sounds. An urgent X-ray was requested.

The chest X-ray taken at that time shows a number of

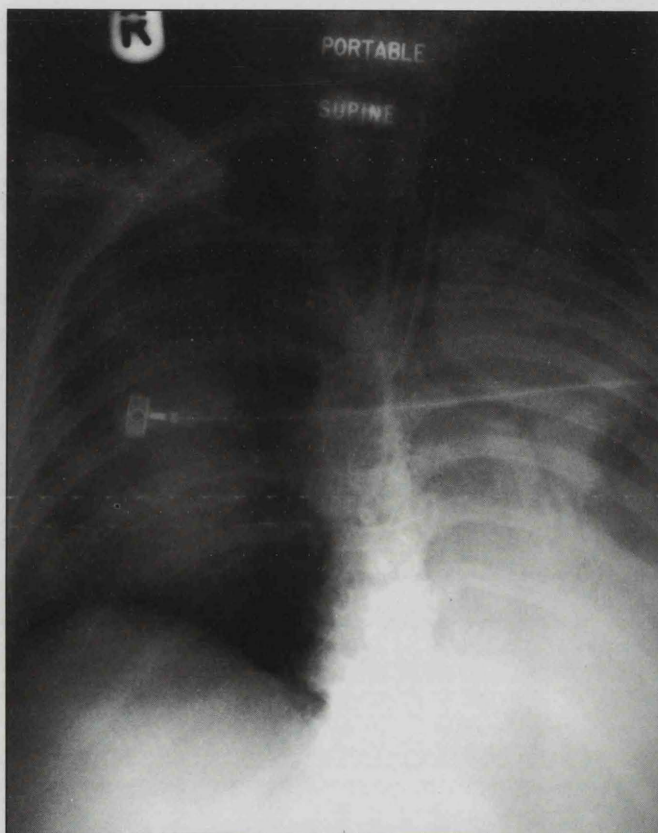


Fig 1

classical and diagnostic signs. The trachea is deviated to the left with marked displacement of the heart shadow, so much so that the right border of the spine is clearly visible. The left lung shows a diffuse increased density in shadowing and a very well-defined air bronchogram extending to the third and fourth generation bronchi.

The tip of the cuffed endotracheal tube is in the right main bronchus and the cuff is seen to be herniating down the left bronchus (Fig 2).

The tube was withdrawn by 3cm. Oxygenation improved immediately as did cardiovascular function.

DISCUSSION

The cause of the oxygen desaturation is right main bronchus endotracheal intubation resulting from tube displacement during patient transfer. The clinical and radiological findings are caused by non-ventilation of the left lung resulting in air

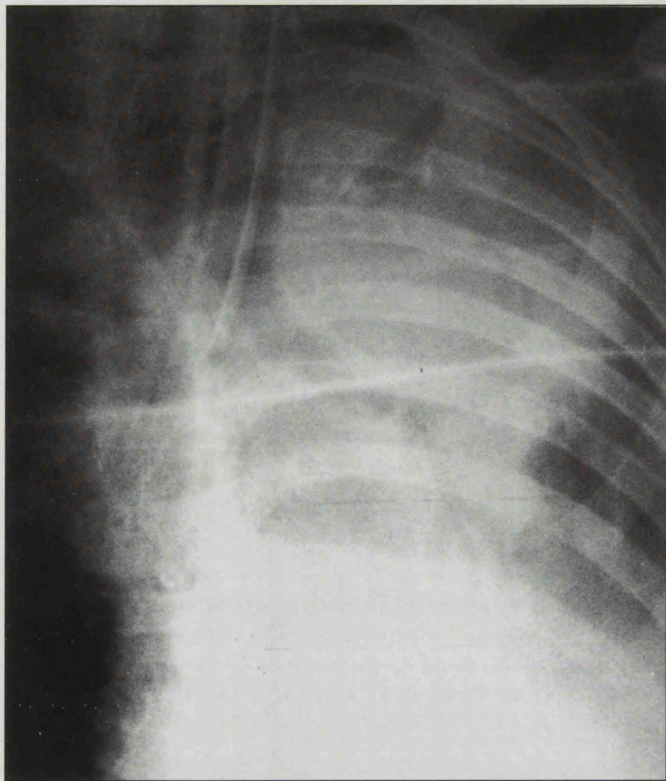


Fig 2

absorption and airway collapse. Cartilaginous rings support the main airways so they remain patent but as the surrounding tissue becomes more dense an air bronchogram becomes apparent. Airway and alveolar collapse reduce lung volume and allow the ventilated right lung to overexpand hence pushing the heart and mediastinum to the left. Hypoxaemia occurs because of a ventilation and perfusion mismatch. The left lung is still perfused receiving 45% of the cardiac output but there is no ventilation and so no oxygenation in this blood.

SUMMARY

Presented here is just one complication of transferring sick and ventilated patients out of the controlled environment of an ICU. The signs and symptoms of right endotracheal intubation are clearly demonstrated clinically and radiologically.

FURTHER READING

Rubens M. B. A Textbook of Radiology and Imaging. Sutton D. (ed). Churchill Livingstone, 1987.

Davies J. M. Anaesthesia. Nimmo, Smith (eds). Blackwell Scientific Publications, 1989.

ANSWERS TO QUIZ ON PAGE 53

1. Angelman syndrome is due to microdeletion on chromosome 15 (15q 11-13). Patients with this condition have mild mental retardation but they also have a characteristic facial appearance which has led to the alternative name of the 'happy puppet syndrome'.
2. The syndrome is important because it is the best example so far described of the role of genomic imprinting in human disease. This is the mechanism by which the phenotypic expression of a genetic disorder depends on the maternal or paternal origin of the mutation. If the microdeletion occurs on the maternally-derived chromosome it leads to Angelman syndrome but if it is on the paternally-derived chromosome it leads to a different condition called Prader-Willi syndrome. This indicates that genes are modified differentially during oogenesis and spermatogenesis so that the members of a homozygous pair of genes act differently in human development.
3. The cardiac disease is endocardial fibroelastosis. This is a rare form of cardiomyopathy of unknown cause. It has not been described previously in Angelman syndrome.