



PNEUMOHYDROTHORAX DUE TO MISPLACEMENT OF NASOGASTRIC FEEDING TUBE

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ABSTRACT

Enteral feeding is the recommended and most preferred way of nutrition in critically ill patients. Despite many advantages of enteral nutrition; any complication regarding enteral tube positioning may lead to life threatening results. We present a 76-year old man admitted to medical intensive care unit with the diagnosis of acute respiratory failure due to multilobar pneumonia who experienced pneumohydrothorax because of misplacement of the enteral feeding tube. The feeding tube was placed by the staff but radiographic confirmation was neglected although clinical evaluation was done. Soon after enteral feeding was started respiratory mechanics and hemodynamic stability deteriorated. Upon aspiration nutritional supplement was realized in respiratory tract and feeding was stopped immediately. A radiological evaluation showed enteral feeding tube misplacement and pneumohydrothorax in the left lung. The tube was extracted and a chest tube was inserted which drained massive amount of nutritional supplement and air. After stabilization of the patient a new enteral feeding tube was inserted and after radiological and clinical confirmation feeding was restarted. In summary, clinical confirmation of tube placement without radiographic confirmation especially in critically ill patient can be misleading and may delay management of complications related to tube placement.

INTRODUCTION

Enteral feeding is recommended as first line nutrition in critically ill patients as long as gastrointestinal tract is intact and functioning [1,2]. Most of the patients in critical care units benefit from early placement of nasogastric feeding tubes. Nasoenteric feeding can be successfully used to provide adequate nutrition to critically ill patients whose medical condition does not allow oral intake [3]. However, there are many reports of misplacement of feeding tubes, ranging from inadvertent placement in the respiratory tract inducing pneumothorax [4,5], esophageal [6] and gastric perforation [7]. We report a case of pneumohydrothorax due to misplacement of nasogastric tube in a male patient admitted to medical intensive care unit (ICU) for acute respiratory failure complicating pneumonia.

Case Report

A 76-year old man was admitted to our medical ICU with the diagnosis of community-acquired multilobar pneumonia . He suffered of acute respiratory failure. He was intubated and controlled mechanical ventilation started with the support of sedoanalgesia. A combination of ampicillin/sulbactam and clarithromycin antibiotherapy was ordered. A nasogastric tube (NT) was placed for enteral feeding by ICU staff physicians. The place of NT was confirmed clinically (auscultation of the epigastrium by air insufflation through the tube) and radiologically (Figure 1.). Clinical response was achieved in a week but ventilatory induced pneumonia superinfection due to *Acinetobacter baumannii* was detected on course. Antibiotherapy was switched to colistin.



Meanwhile percutaneous tracheostomy was applied because of prolonged intubation (21 days). On the twenty-second day of ICU stay his NT was realized to come out during positioning. It was replaced. The place of NT was controlled clinically but portable x-ray was out of order and under technical repairment so radiological verification could not be done. His oxygen saturation and hemodynamic findings started to deteriorate in hours after enteral feeding was started. The mechanical ventilator alarm system detected high peak inspiratory and plateau pressures, high resistance and low compliance values. Upon aspiration through intubation tube excess amount of enteral feeding supplement was detected. The enteral feeding was immediately ceased and after confirming that radiological imaging could be performed a new chest x-ray was ordered. In this chest x-ray the NT was detected to be misplaced into the left hemithorax and aeration was lost on that side (Figure 2.). The NT was extracted. Thoracal computerized tomography (CT) revealed pneumo hydrothorax on the left side (Figure 3.). A chest tube was

applied on left midaxillary line through sixth intercostal space and approximately 1000 ml of purulent liquid material drainage and air leakage was observed. The peak and plateau pressures, tidal volume, compliance and oxygen saturation values ameliorated in minutes after the procedure. A control chest x-ray demonstrated increased aeration with the chest tube in place (Figure 4.). A new NT was inserted and checked clinically and radiologically by thorax CT.

After confirming the right placement of NT enteral feeding was restarted. The chest tube was kept in place until cessation of air leakage and fluid drainage < 100 ml/daily was achieved and thereafter extracted on the fifth day of placement. The patients clinical status progressively ameliorated and on the ninth day of admittance he was weaned from mechanical ventilation and allowed to breath spontaneously. On the fourteenth day of hospitalization he was discharged from ICU. The rest of the hospital course of this patient was unremarkable, and he fully recovered.

Figure 1. The chest x-ray at admittance with multilobar pneumonia and nasogastric tube in stomach.

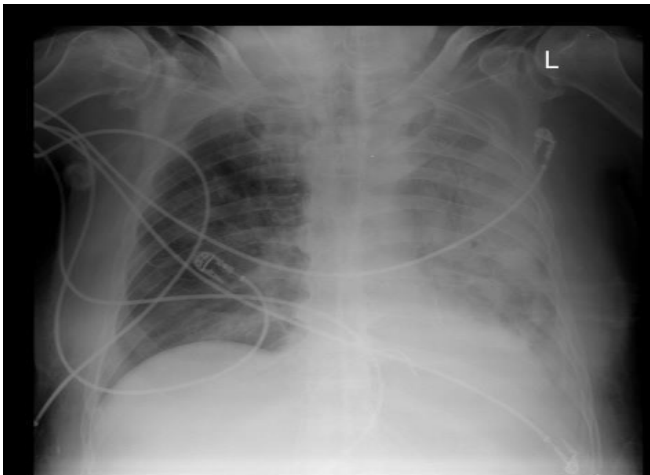


Figure 2. Chest x-ray demonstrating misplaced nasogastric tube in left hemithorax extending till left costophrenic sinus(black arrows)

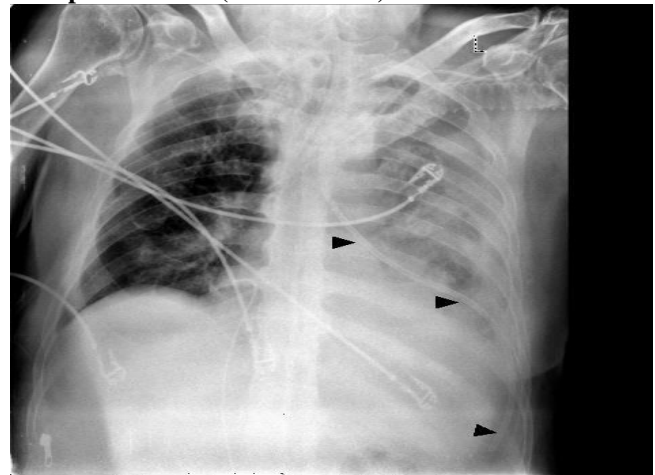


Figure 3. Thorax CT demonstrating left pneumo (black arrows) and hydrothorax (white arrow)

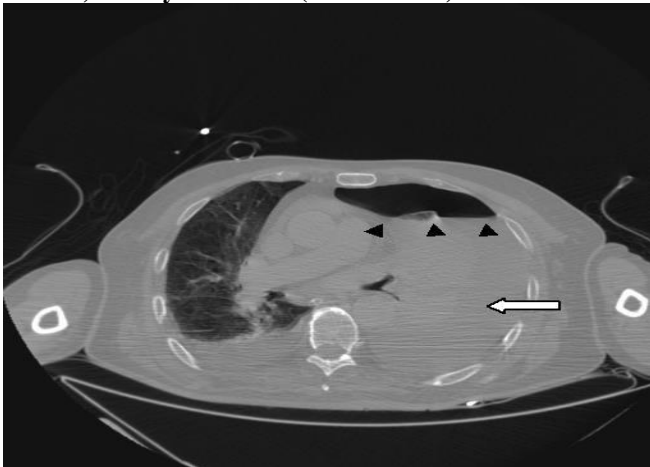
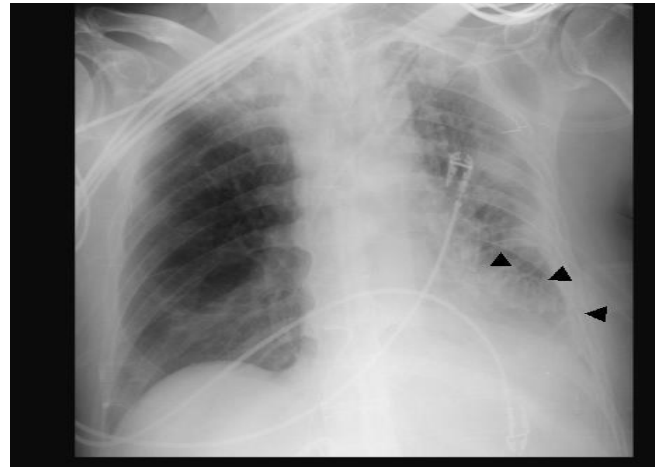


Figure 4. Chest x-ray after left chest tube (black arrows) insertion



DISCUSSION

The importance in timing of early enteral nutrition in critically ill patients has been well described and is widely endorsed [8,9]. Placement of the flexible nasoenteric feeding tubes in critically ill patients is not so easy. A retrospective review reported airway misplacement of feeding tubes occurring at an incidence of 3.2% , with 1.2% complicated by pneumothorax [10]. McWey et al described 14 misplacements of 1100 nasoenteric placements for a rate of 1.3% in patients with either a cuffed endotracheal tube or tracheostomy tube [11].

Clinical confirmation of tube placement without radiographic confirmation especially in critically ill patients can be misleading and may delay management of complications related to tube placement. Close observation is important especially for those on mechanical ventilation due to the risk of a tension pneumothorax. It is extremely important to obtain a chest x-ray after the misplaced nasoenteric tube is removed, even if there is no evidence of pneumothorax prior to tube removal.

Therefore, we ordered a thorax CT after the removal of the feeding tube and diagnosed pneumohydrothorax due to misplacement of nasogastric

tube. Insertion of feeding tubes is routine but not without potential complications. In compromised and unconscious patients, a chest x-ray should be performed to confirm tube placement. If the tube has entered the respiratory tract, serial radiographic films should be obtained to assess potential serious lung injury such as a pneumothorax and tension pneumothorax. Pneumothorax complicating feeding tube placement therefore need to be treated with chest tube or thoracic vent placement.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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