

Complications of Nasogastric Tube Placement - Don't blow it

Abstract:

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Preventable complications may be associated with the placement of nasogastric tubes. Our report raises awareness of the potentially fatal complications that can occur. We also recommend an approach for clinicians which may be used to avoid significant patient morbidity.

Introduction

We report two cases of nasogastric tube placement which resulted in significant morbidity from a common procedure. Our first case resulted in a pneumothorax, our second in a lung abscess. Both complications were detrimental to the recovery of two already critically ill patients. Nasogastric tube placement is usually uneventful. However, complications including lung abscess, pleural effusion, pneumothorax and retropharyngeal abscess have previously been reported.

Case Report

Case 1

An eighty-eight year old lady was admitted to our Geriatric service with a brainstem stroke. The decision to start nasogastric feeding was taken on day three. On day five a replacement nasogastric tube was required. A Geriatric staff nurse inserted the tube and the position was confirmed by air insufflation. Feeding was then recommenced. One hour later the patient became agitated and chest radiograph was performed. The feeding tube was seen in the right bronchus. Another chest radiograph was used to confirm placement of a replacement nasogastric tube. It showed a right sided pneumothorax. The pneumothorax occurred either as a result of air insufflation of the nasogastric tube placed next to pleural space or direct penetration of the pleura during insertion of the tube. The patient required a chest drain for three days and subsequently developed pneumonia further delaying her recovery. She was ultimately fed using a percutaneous endoscopic gastrostomy tube.

Case 2

A 73 year old man was admitted to our Geriatric services with Total Anterior Circulation Stroke. A nasogastric tube was inserted on day one. A medical intern confirmed placement by chest radiograph and feeding was commenced. Five hours later our patient developed respiratory compromise. The nasogastric tube was in the left main bronchus as shown. Approximately 300mls of nasogastric feed had been infused. Subsequent CT Thorax showed a fluid-filled cavity in the left lower lobe consistent with lung abscess and pleural effusion. These complications were treated by recurrent drainage and antibiotics but both contributed significantly to the patient's ultimate demise during a six month hospitalisation.

Figure 1: NGT in right main bronchus.

Figure 2: NGT in left main bronchus.

Discussion

The therapeutic use of nasogastric feeding can be traced to John Hunter in the 1790s. The efficacy and cost effectiveness of enteral nutrition has long been demonstrated. It is less expensive, less prone to complications and more physiological than intravenous feeding¹. The rate of inadvertent airway placement of nasogastric tubes vary from 0.3 to 15%². Pulmonary complications occur in 0.2 to 0.3% of placements³. The probability of a pneumothorax from a central line insertion is 1 to 2%⁴.

There is no universally accepted technique and potential complications may have already occurred prior to confirmatory investigation⁵. The experience of the individual placing the tube is not a major factor for misplacement⁶. Patients include those intubated and sedated, the elderly, mentally obtunded, post lung transplant and repeated attempt after earlier complications⁷. Clinically unreliable signs of correct placement include; easy placement, absence

². High risk

of coughing, visual inspection of aspirate and positive auscultation. The clinician should be weary of the use of auscultation to verify correct placement of tubes. Positive auscultation yields a 20% false positive rate the tube does not assist in interpretation of correct placement either clinically or radiologically. Misinterpretation of radiographs occurs in 27% . The mean pH in the lung and intestine is significantly higher than the stomach. The mean bilirubin in the lung is lower than the stomach and intestine, it can be measured with a calorimetric visual scale teststrip. Capnography is a proven surrogate marker for the pulmonary environment ¹⁰, while endoscopic technology may also have a role . Roubenoff and Ravich advised a technique for successful tube placement, using two radiographs. These authors suggest the method avoids tracheopulmonary placement and is cost effective

We recommend a radiograph should be used to confirm tube placement prior to feeding. While gastric pH and auscultation maybe used as adjuncts to confirmation of tube placement they must not be used in isolation. The clinician placing the tube and interpreting the radiograph should seek support according to his level of expertise. One such online support tool is available on the New England Journal of Medicine website at www.nejm.org/multimedia/medical-videos.

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References

1. Takwoingi YM. Inadvertent insertion of a nasogastric tube into both main bronchi of an awake patient. A case report. *Cases Journal* 2009;2:6914.
2. Roubenoff R, Ravich WJ. Pneumothorax due to nasogastric feeding tubes. Report of four cases; Review of the literature and recommendation for prevention. *Arch Intern Med* Vol 149 Jan 1989.
3. Thomas B, Cummin D, Falcone RE. Accidental pneumothorax from a nasogastric tube. *N.Eng. JMed* 1996;335:1325-1326.
4. Rassias JA, Ball PA, Corwin HL. A prospective study of tracheopulmonary complications associated with placement of narrow bore enteral feeding tubes. *Critical Care* 1998;2:25-28.
5. Ryan JA, Abel RM, Abott WM. Catheter complications in total paraenteral nutrition. *N Eng J Med* 1974;290:751-761.
6. Weinberg L, Skewes D.S. Pneumothorax from intrapleural placement of a nasogastric tube. *Anaesth Intensive Care* 2006 Apr;34:276-9.
7. Pillai JB, Vegas A, Brister S. Thoracic complications of nasogastric tubes: Review of safe practice 2005;4:429-433.
8. Benya B, Langer S, Marbarhan S. Flexible nasogastric feeding tip immediately after placement. *Journal of Parenteral and Enteral Nutrition*. 1990;141:108-109.
9. Hendry PJ, Akyurekli Y, McIntyer R, Quarrinston A, Kean J. Bronchopleural complications of nasogastric feeding tubes. *Crit Care Med* 1986;14:892-894.
10. Araujop CE, Methando ME, Gutterrez FJ, Mantallis T, Casteliano MA. Use of capnometry to verify feeding tube placement. *Crit Care Med* 2002;30:2255-2259.