

IATROGENIC TENSION PNEUMOTHORAX FOLLOWING NASOGASTRIC TUBE WITHDRAWAL

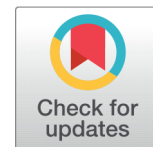


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ABSTRACT

Nasogastric tube (NGT) insertion is a simple procedure and generally uneventful. However, complication due to NGT misplacement ranges from tracheobronchial injury, pleural effusion, to a more catastrophic outcome like tension pneumothorax. This case report represents a tension pneumothorax following nasogastric tube withdrawal.

A 67-year-old women known case of hypertension and heart failure was recently diagnosed with buccal Squamous cell carcinoma (SCC) and scheduled for an elective mandibulectomy. Post-operatively patient was admitted to the Surgical Intensive Care Unit (SICU). NGT was inserted. A chest X-ray shows a nasogastric tube mistakenly inserted into the right lung, which led to concealed pleural perforation. Upon withdrawal of the NGT, the patient suddenly became hypoxic and hypotensive and unfortunately developed tension pneumothorax.

المخلص

إدخال الأنبوب الأنفي المعدي (NGT) هو إجراء بسيط بشكل عام. ومع ذلك، فإن المضاعفات الناتجة عن وضع NGT بشكل خاطئ قد تشمل إصابة القصبة الهوائية، والانصباب الجنبي، وحتى نتائج أكثر كارثية مثل استرواح الصدر الضاغط.

في هذا التقرير الطبي نعرض إحدى المضاعفات الناتجة عن إدخال الأنبوب الأنفي المعدي بشكل خاطئ لمریضة تبلغ من العمر 67 عامًا تعاني من ارتفاع ضغط الدم وفشل القلب وتم تشخيصها مؤخرًا "بسرطان بالعم (buccal Squamous cell carcinoma (SCC) وقد أجري لها عملية استئصال للفك السفلي. تم إدخال المريضة بعد الجراحة إلى وحدة العناية المركزة الجراحية (SICU) والذي تم فيه إدخال الأنبوب NGT. أظهرت الأشعة السينية على الصدر أن الأنبوب الأنفي المعدي تم إدخاله عن طريق الخطأ في الرئة اليمنى، مما أدى إلى ثقب جنبي مخفي. عند سحب الأنبوب NGT، عانت المريضة فجأة من نقص الأكسجين وضغط الدم كما نتج عن ذلك حالة لاسترواح الصدر الضاغط.

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Keywords: Tension Pneumothorax, Nasogastric Tube, Pleural Perforation, tracheobronchial injury, Chest X-ray, Gastrographine.

1. INTRODUCTION

Nasogastric tube (NGT) insertion is a common practice for different indications [1]. According to the Food and Drug Administration (FDA), from January 2012 to July 2017, there were 51 case reports of pneumothorax associated with nasogastric tube placement [1, 2]. The purpose of this case report is to put a spotlight on the possible catastrophic outcome of NGT misplacement after the removal of a feeding tube.

2. CASE PRESENTATION

A 67-year-old woman known case of hypertension and heart failure with reduced ejection fraction to 45%. recently diagnosed with buccal Squamous cell carcinoma (SCC) scheduled for an elective mandibulectomy and reconstruction with pan-endoscopy and left Modified radical neck dissection. Post-operatively patient was admitted to the SICU. NGT was inserted at 12:30pm and an x-ray was done at 1:00pm but was inconclusive. At 05:00pm gastrographine was injected and an x-ray was done. upon the primary physician's request to assess tip position. Upon evaluation of chest X-ray, NGT was inserted mistakenly into the airway and then advanced to the right main bronchus to the lower posterior bronchiole branches and end up in the right lung [Figure 1].

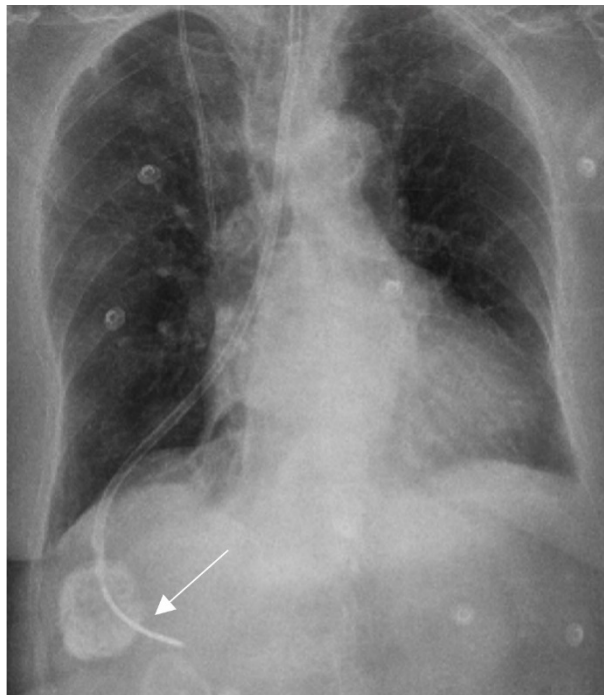


Figure 1 NGT was inserted mistakenly into the airway, then advanced to the right main bronchus

Unfortunately, gastrographine was injected to confirm NGT position at 17:52 which is unneeded because of clear misplacement, contrast material is clearly injected into the lungs highlighting bronchioles and visceral pleura but not the stomach, tip is likely causing concealed pleural perforation [Figure 2].

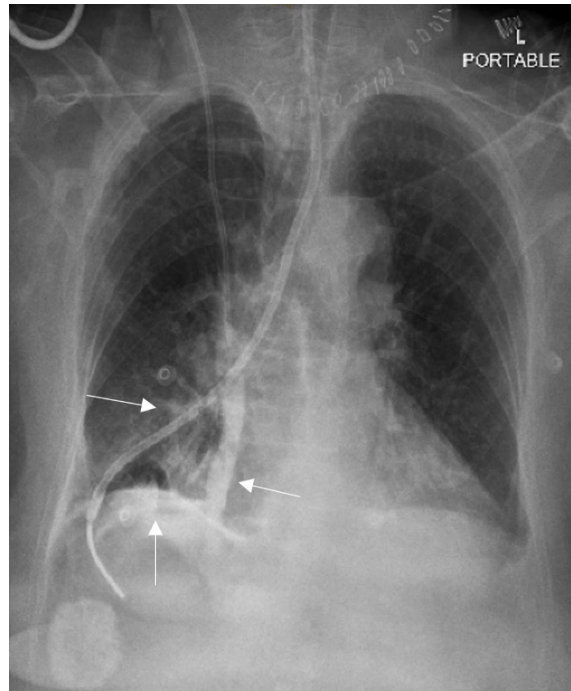


Figure 2 Contrast material is injected into the lungs highlighting bronchioles and visceral pleura but not the stomach.

Next day at 03:50 chest X-ray redemonstrate misplacement of NGT (right lower lung) with right lower lung opacification, basal atelectasis, and blunting of both costophrenic angles more on the right side due to NGT feeding material [Figure 3].

After NGT withdrawal the patient developed Tension pneumothorax [Figure 4]. The patient suddenly became hypoxic and hypotensive which wasn't earlier and needle decompression was inserted in the right 4th intercostal mid-axillary line which results in a gush of air and whitish-color liquid. On the same day, patient underwent needle decompression and insertion of right sided chest tube. Full inflation of the right lung achieved with minimal suction. Whitish milky fluid drainage done almost one liter which consist of pleural exudate with pus. It was sent to culture and sensitivity and was found to be *Klebsiella Pneumoniae* and *Pseudomonas aeruginosa*. Right exploratory thoracotomy planned for the next day. Due to the improvement in patient condition the procedure kept on hold. Patient was hemodynamically stable with fully expanded lung.

Ten days post this incident, patient was discharged in excellent condition and scheduled for follow up but she did not show for her appointment.



Figure 3 Right lower lung opacification, basal atelectasis, and blunting of both costophrenic angles more on the right side.

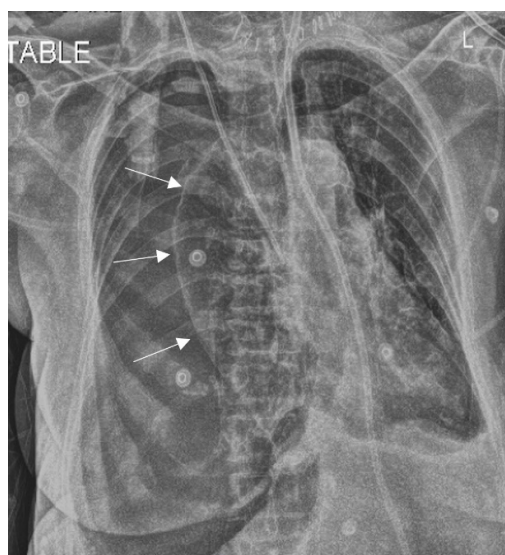


Figure 4 Right-sided tension pneumothorax.

3. DISCUSSION

NGT blind insertion is a common practice, nevertheless, caution must be taken since complications due to misplacement can happen and it will affect the patient's morbidity as well as mortality [1, 2]. Complications of inserting a nasogastric tube include sinusitis, epistaxis, nasopharyngeal ulceration, vocal cord paralysis, esophageal perforation, thoracic complication, and even death [1–4].

Thoracic complications include bronchial perforation, pleural cavity penetration, and bronchial placement leading to pneumonia, lung abscess, and atelectasis [3]. The patient safety authority documented 166 cases of NGT misplacement from 2011-2016, 137 cases had a misplacement into the lung, and 56 of these cases developed serious harm [4].

According to another case report, a 73-year-old geriatric patient had a nasogastric tube inserted for feeding, then a few hours later, developed respiratory distress. Radiology confirmed a nasogastric tube was in the left main bronchus, followed by a CT scan showing a fluid-filled cavity consistent with pleural effusion and lung abscess in the left lower lobe, patient was managed by repeated drainage and antibiotics. Unfortunately led to the patient decease after hospitalization for a few months [5]. Another complication is intracranial insertion. Like a documented report of a 70 years-old female post pituitary adenoma resection, NGT was inserted by a nurse, CT scan showed NGT placed through the sphenoid sinus into the right partial lobe and lateral ventricles sadly led to hemorrhage and pneumocephalus [6].

This report presents a patient who developed tension pneumothorax following a withdrawal of a misplaced feeding tube. Ensuring the correct placement of NGT as well as close monitoring after removal is an essential step to avoid unnecessary complications [4–6].

X-ray is the gold standard method for NGT placement confirmation. However, misplacement of NGT due to X-ray misinterpretation is not rare [1, 2]. Providers solely focus on the location of the tube tip rather than the path the tube is taking. So radiological imaging should be handled by a skilled practitioner to assure accurate reading and to prevent unnecessary misinterpretation [7]. Other methods include PH testing, observation of bubbles, and auscultation [4, 7]. Still, these methods have their own limitation. They were lacking both sensitivity and specificity [7]. Another method used is ultrasonography during the COVID-19 Era to help confirm nasogastric tube placement. Correct NGT placement was confirmed using Abdominal ultrasonography, although studies have yet to find sufficient results it's been recognized as an easy safe technique. As well as an alternative to X-rays in critically ill patients admitted to ICU [8].

Health care workers must consider the risk of developing tension pneumothorax when correcting a misplaced tube. New reliable methods need to be discussed and done to assure a safer insertion of feeding tubes.

4. CONCLUSIONS

In this case report, A female patient developed tension pneumothorax following NGT withdrawal. NGT is usually a safe, uneventful procedure. But care must be taken to avoid unnecessary complications. This case report hopefully will inspire health care workers to find a new reliable method to ensure the correct placement of feeding tubes.

CONFLICT OF INTEREST

There is no conflict of interest to declare

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N/A

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