

Necrotising Fasciitis of the Abdominal Wall: A Lethal Gastrostomy-associated Complication

Sir,

Gastrostomy tube insertion is a common procedure performed by gastroenterologists and general surgeons. Percutaneous gastrostomy is indicated for the provision of enteral nutrition (EN) in patients with motor neuron disease, cerebral infarcts, bulbar or pseudo-bulbar palsy, carcinoma of the head and neck region, and so forth. While percutaneous gastrostomy is a safe procedure, complications can occur infrequently. Necrotising fasciitis of the abdominal wall is a lethal complication of feeding gastrostomies.



Figure 1: Physical examination of the abdomen revealing discoloration around the gastrostomy site.

An 81-year lady with a history of hypoxic encephalopathy (tracheostomy- and gastrostomy-dependent) and end-stage renal disease (ESRD) was brought to the emergency department (ED) with complaint of fever for 3 days. Upon evaluation, she was febrile, tachycardiac, and hypotensive. Subcutaneous emphysema was palpable throughout the abdomen and chest wall. Skin discoloration was also noted around the gastrostomy site (Figure 1). At the time of initial evaluation by ED physicians, the gastrostomy tube was noted to be dislodged. Of note, the gastrostomy tube was placed two years prior to the current presentation during a prolonged hospitalisation for septic shock. At that time, the patient required prolonged mechanical ventilation necessitating tracheostomy and gastrostomy. Since then, the patient had not experienced any gastrostomy-associated complications. In the ED, the gastroenterology team exchanged the tube at the bedside. She was resuscitated with intravenous fluids and started on clindamycin, meropenem, and vancomycin for broad-spectrum coverage. Initial laboratory investigations were remarkable for a total leukocyte count of $44,700/\text{mm}^3$ with 90% neutrophils. Abdominal computed tomography showed significant subcutaneous emphysema within the anterior abdominal

wall and both breasts (Figure 2). These clinical features supported a diagnosis of abdominal wall-necrotising fasciitis. Her blood cultures grew *Klebsiella pneumoniae* (resistant to carbapenems) and polymyxin B (colistin) was added. The patient's healthcare proxy was informed about the patient's declining condition and the need for surgical debridement. In line with the patient's previously stated wishes, surgical debridement was withheld and she eventually expired on the ninth day of admission.

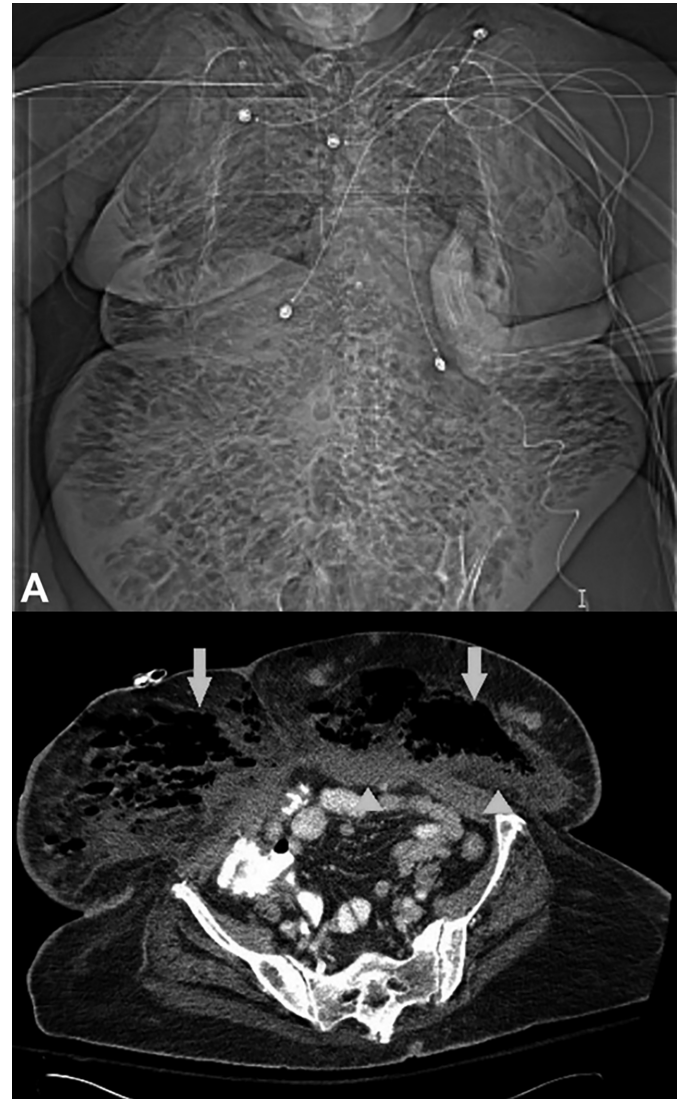


Figure 2: Computed tomography of the abdomen. (A) Scout film of computed tomography revealed subcutaneous emphysema throughout the abdominal wall and both breasts. (B) Axial sections of computed tomography demonstrating subcutaneous emphysema (arrows) and fat stranding (arrowheads) within the anterior abdominal wall.

The most lethal — albeit infrequent—complication of feeding gastrostomies is necrotising fasciitis of the abdomen. In an observational study by Grant *et al.*, the incidence of necrotising fasciitis was 1 in 129 gastrostomy insertions.¹ Risk factors for this complication are advanced age, bedridden status, diabetes mellitus, obesity, immunocompromised status, tube dislodgement, and buried bumper syndrome.²⁻⁵ Tube dislodgement can also facilitate infection

by gas-producing organisms.³ In this case, several risk factors were present including old age, bedridden status, obesity, tube dislodgment, and possible immunocompromised state in the setting of ESRD. These factors — coupled with tube dislodgment — likely contributed to the development of this dreaded complication. In the published literature, *Candida* spp. has been implicated in cases of tube dislodgment and reported to cause an emphysematous infection.³ In cases of gastrostomy-associated necrotising fasciitis unresponsive to antibiotics, the possibility of *Candida* infections should be considered and prompt antifungal therapy should be instituted. In this case, carbapenem-resistant *Klebsiella pneumoniae* was growing in blood cultures and likely represented the pathogenic organism. Interestingly, Yang and colleagues reported that *Klebsiella pneumoniae* infections have increased in incidence worldwide in recent years and are associated with bloodstream infections.⁵ In this case, no distant sites of metastatic infections were apparent. Moreover, in the report by Mohd Said *et al.*, polymicrobial infection occurred in about one-third of cases of gastrostomy-associated necrotizing fasciitis.¹ Due to this reason, broad-spectrum antibiotic therapy active against gram-positive cocci, gram-negative rods, and anaerobic organisms should be empirically instituted. In this case, clindamycin, vancomycin, and meropenem were empirically started; however, since the implicated organism was carbapenem-resistant, appropriate antimicrobial therapy with polymyxin B (colistin) was started after the blood cultures results. This delay in the institution of antibiotics likely contributed to the dismal outcome and has been emphasised in prior reports as well.^{1,4} Keeping the aforementioned factors aside, the most important factor implicated in mortality, in this case, was the decision to not pursue surgical treatment. As described by Yang *et al.*,⁵ surgery is the gold standard for both diagnosis and treatment.

Gastrostomy-associated necrotising fasciitis is an infrequent but dreaded sequela of feeding gastrostomy. Timely diagnosis and prompt management of this complication are paramount to preventing dismal outcomes. The mortality rate of gastrostomy-associated necrotising fasciitis is reported to be 30% despite timely surgical intervention.¹ Therefore, prevention is the key to tackling this complication. Although there are no evidence-based guidelines available for prevention, a number of measures have been suggested including monitoring the length of the external portion of the tube, gently rotating the gastrostomy tube in and out to relieve tension, and maintaining a space of 1.5–2 cm between the abdominal wall and the external bumper.^{3,4} All critical care physicians should have a high index of suspicion for this lethal — albeit rare — complication in order to provide timely care and improve patient outcomes.

PATIENT'S CONSENT:

Informed consent was obtained from the patient's next-of-kin for publication of this case report (as the patient herself had anoxic brain injury and could not communicate).

COMPETING INTEREST:

The authors declared no competing interest.

AUTHORS' CONTRIBUTION:

NB, AR: All authors were involved in the care of this patient and prepared the initial draft of the manuscript.

MS: Reviewed the manuscript and revised it for important intellectual content.

All authors approved the final version of the manuscript to be published.

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