Learning from errors

Colonic injury following percutaneous endoscopic-guided gastrostomy insertion

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Summary

Percutaneous endoscopic gastrostomy (PEG) is a common practice usually offered to patients who are unable to tolerate or swallow oral feed and require long-term nutrition.

We present a case of early pneumoperitoneum after a PEG placement due to colonic perforation. The patient was severely malnourished and had a medical history of brain injury, cerebrovascular accident cerebrovascular accident (CVA) and bilateral below knee amputations from a bomb blast 13 years ago.

The PEG tube was placed under sedation. On the first postoperative day, the patient had a subtle pneumoperitoneum that was considered secondary to the procedure. On the third postoperative day, the patient became tachycardiac with abdominal distension. A CT scan showed the PEG tube traversing through the transverse colon.

The patient underwent a laparotomy and repair of colonic injury and made an uneventful recovery.

BACKGROUND

Percutaneous endoscopic gastrostomy (PEG) is common practice in the modern era of medicine. PEG tube is usually offered to patients who are unable to tolerate or swallow oral feed and require long-term nutrition. There are various indications for using a PEG, including neurological conditions, head and neck cancers, oesophageal cancers and strictures.

PEG tube placement is usually a safe procedure with low morbidity and mortality. The reported figures in literature for major complications are between 3% and 8% and minor in around 14%.^{1 2} Two of the major complications are gastric perforation that presents early and gastrocolic fistula that presents later in the course of follow-up.

Malposition of PEG is a serious complication and can occur at the time of insertion or chronically. A subtle pneumoperitoneum on plain chest x-ray is usually ignored in the early post-procedure period.

We present a case of early pneumoperitoneum after a PEG placement due to colonic perforation.

CASE PRESENTATION

A 55-year-old woman was admitted to hospital with dehydration, significant weight loss and poor oral intake. The patient had a history of brain injury, CVA and bilateral below knee amputations from a bomb blast 13 years ago. She also had a medical history of chronic obstructive pulmonary disease, epilepsy and previous exploratory laparotomy for a perforated duodenal ulcer.

The patient was severely malnourished and continued to decline food. She was deemed not to be suitable for long-term nasogastric feeding and, after discussion with the family, a multidisciplinary decision was made to proceed with the PEG tube placement.

The procedure was performed on a surgical theatre list under sedation. It was a difficult procedure due to the stomach lying quite high behind the rib cage but check endoscopy showed good placement of the internal bumper of the PEG tube.

On the first postoperative day, the patient had a subtle pneumoperitoneum that was considered secondary to the procedure. At 3 days post-procedure, the patient developed sudden onset abdominal distension and became tachycardic at 101 bpm. She was otherwise stable. It was noted that C reactive protein had risen to 336 with a normal leucocyte count. On examination, her abdomen was noted to be distended, generally tender, with absent bowel sounds.

INVESTIGATIONS

Urgent radiographs of chest and abdomen were performed. The chest x-ray showed raised left hemidiaphragm with free air (figure 1). Abdominal x-ray revealed gas-filled loops of bowel with a positive Rigler's sign (the double wall sign seen on an x-ray of the abdomen when air is present on both sides of the intestine; figure 2).

A CT scan subsequently showed a large amount of free intraperitoneal air. The PEG tube was seen in the stomach but had passed through the splenic flexure of the colon (figure 3).

The patient was a very high risk candidate for surgery but again, after a detailed discussion with the family, a multidisciplinary decision was made to return the patient to theatre.

TREATMENT

An upper midline laparotomy was performed and a sealed colonic perforation was found (figure 4). The transverse colon was seen to be adherent to both the stomach and anterior abdominal wall. There was no faecal contami-

Figure 1 Free gas under the diaphragm.

nation. The colonic perforations were sutured and covered with omentum. Gastrostomy tube was replaced under direct vision into the stomach.

OUTCOME

Postoperatively the patient made a very smooth and quick recovery and was consequently started on PEG feed.

DISCUSSION

There are various recognised complications of PEG tube insertion, including wound infection, tube migration, aspiration, gastric haemorrhage, stomal leak, ileus and bowel injury.³ In fact, 3–8% of patients having PEG placements will experience a major complication while 14–23% experience a minor complication.^{1 2}

Malposition of PEG is a serious complication and can occur at the time of insertion or chronically.⁴ It is thought to happen chronically if the PEG is pulled too tightly and subsequently erodes through the gastric wall or can occur when the tube is changed if it has been sited through the bowel at time of insertion. The site of malposition can be through the small bowel or colon. These patients often present with transient diarrhoea after PEG feeding.⁵ Faecal material may be seen in the PEG tube when it is left on free drainage and faeculent vomiting may occur due to passage of faeces from the colon to the stomach through the gastrocolic fistula.⁶ Most of these patients are discovered late especially at the time of a PEG tube change.

Iatrogenic bowel injury during PEG insertion is more commonly seen in older or very young patients as the colonic mesentery is lax. Excessive insufflation of air into

Figure 2 Free intraperitoneal gas (Rigler's Sign).

the stomach during the procedure is thought to cause gastric rotation, which can pull the transverse colon to the stomach.⁷ If the tube passes through the bowel and is pulled tight the patient may remain asymptomatic until the time of tube replacement.

A small amount of pneumoperitoneum after PEG insertion is usually considered as a benign finding. In our case, the patient had a significant pneumoperitoneum (>2 cm)³ and further investigations were performed to determine its nature. Most PEG insertions do not result in pneumoperitoneum but in as much as 38% of cases⁸ there will be pneumoperitoneum. This will be a benign finding in the majority of these cases but further investigations are warranted if free air (no matter how small) fails to resolve within 72 h of

the PEG insertion. We believe that the incidence of malposition of PEG is under-reported due to the reluctance to investigate small pneumoperitoneum early in the course of management.

Diagnosis of bowel injury secondary to PEG tube insertion can be a diagnostic challenge. The PEG tube candidates usually have altered levels of consciousness, communication problems and tend to be malnourished. The early signs of bowel injury, such as pain and tenderness, are easily missed in these frail patients. Therefore, it is reasonable to have a low threshold for further investigations in patients who develop pneumoperitoneum after a PEG tube insertion to look for iatrogenic bowel injury.

Figure 3 CT Scan showing percutaneous endoscopic gastrostomy (PEG) tube traversing the transverse colon.

Figure 4 Per operative findings (PEG tube traversing the transverse colon).

Learning points

- There should be a low threshold for further investigations looking for iatrogenic bowel injury as a small post-procedural pneumoperitoneum could be the only finding in these fragile patients.

Competing interests None.

Patient consent Obtained.

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