

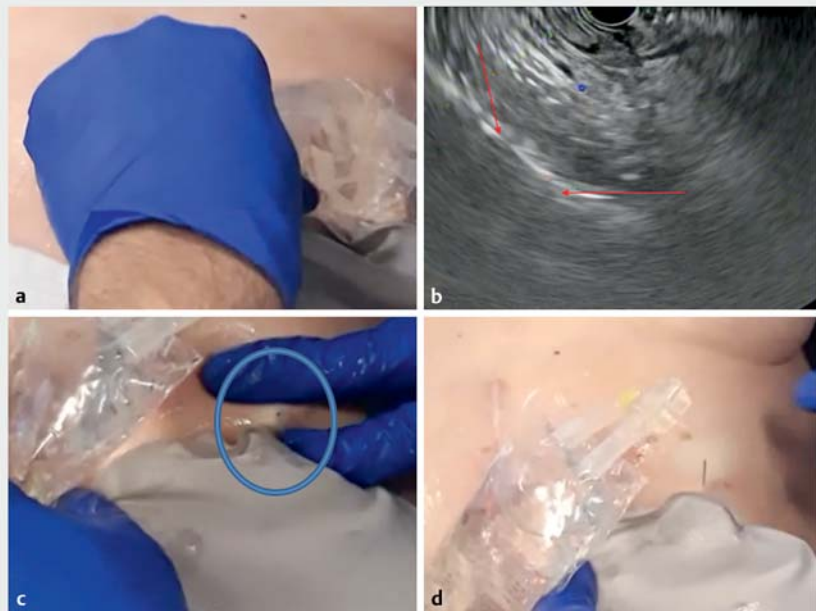
## Endoscopic ultrasound-guided gastrostomy to avoid interposed digestive loop is effective when lack of transillumination prevents percutaneous approach

We report a case of a 71-year-old woman suffering from an ileal neuroendocrine tumor with peritoneal carcinosis leading to an occlusive syndrome. This patient had previously undergone abdominal radiation therapy and ileostomy. In a multidisciplinary team discussion, a gastrostomy was proposed in order to reduce the obstructive symptoms of the carcinosis.

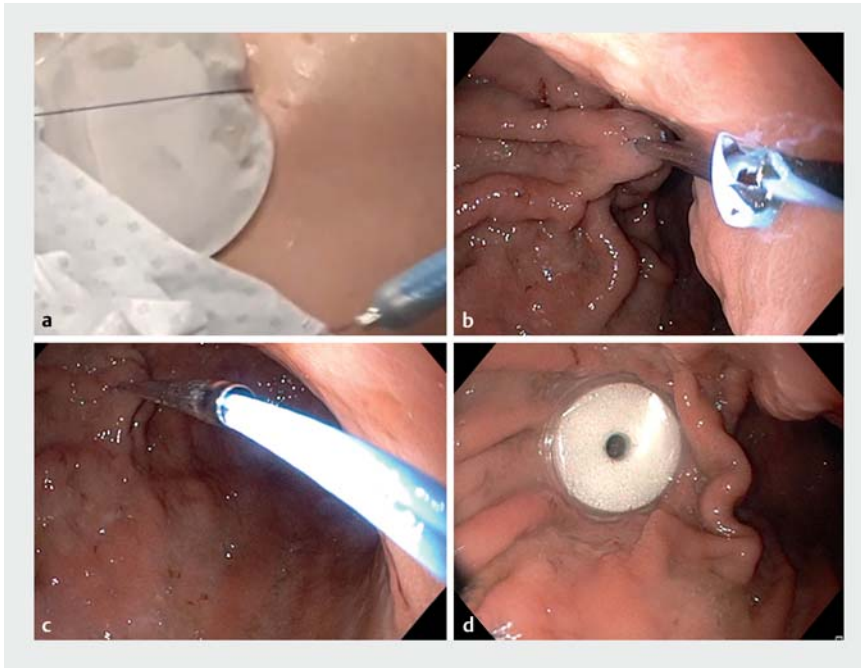
Percutaneous endoscopic pull gastrostomy was attempted but failed because, despite many attempts, it was impossible to transilluminate properly. CT scan showed a deep position of the stomach with interposition of the small bowel stoma. To reduce the risk of puncture through an interposed digestive loop in a percutaneous radiologic approach, we decided to use a linear ultrasound endoscope to puncture from the stomach a bag full of liquid placed on the patient's skin after application of ultrasound gel (► **Fig. 1**; ► **Video 1**). Hand pressure on the bag of liquid was needed to reduce the distance between the skin and the stomach. This technical trick allowed us to ensure through endoscopic ultrasound (EUS) monitoring that there was no vascular or small bowel interposition in the way of the 19-G needle used to puncture the bag through the stomach wall. The needle successfully crossed the skin with the aid of digital stretching of the skin. We then passed a 0.035-inch guidewire (Visiglide; Olympus, Tokyo, Japan). Once the guidewire was stretched, transillumination became possible by reducing the distance between the stomach and the skin. We introduced the gastrostomy introducer on the guidewire (► **Fig. 2**) and then placed a 16-Fr Bard gastrostomy tube using the conventional technique. Only one report shows the use of EUS to place a gastrostomy in the case of a non-transilluminated abdominal wall [1]; our



► **Video 1** Endoscopic ultrasound-guided placement of a guidewire through the gastric wall when digestive loop interposition prevents transillumination.



► **Fig. 1** Endoscopic ultrasound (EUS)-guided puncture through the gastric wall targeting a water bag placed on the skin. **a** Bag of water on the skin applied with pressure. **b** EUS detection of the bag (red arrows), avoiding interposed loop. **c** Puncture through the skin after skin stretching (blue circle). **d** Needle coming through the skin.



► **Fig. 2** Gastrostomy placement on the guidewire placed with the EUS needle. **a** Guidewire placed through the 19-G needle. **b** Gastrostomy introducer placed on the guidewire. **c** Placement of the gastrostomy loop to fix the tube. **d** Gastrostomy tube in place.

case demonstrates that this technique can also be useful to avoid accidental puncture through interposed digestive loops [2,3] in patients in whom a previous history of surgery and radiation therapy may have reduced transillumination and caused adhesions in the area, making conventional techniques impossible or dangerous.

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### Competing interests

The authors declare that they have no conflicts of interest.

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