Case 2874

Per-oral image guided gastrostomy (PIG)
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Section: Interventional radiology
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Patient: 72 years, female

Clinical History:
This pertains to interventional radiology for nutritional support.

Imaging Findings:
A patient with terminal pharyngeal cancer with worsening dysphagia was referred for nutritional support. She had undergone radiotherapy previously and insertion of a tracheostomy tube, but the increasing tumour bulk implied that she was only able to swallow liquids. Radiological insertion was requested, as the gastro-enterologists deemed the patient unsuitable for percutaneous endoscopic gastrostomy (PEG). After informed consent, the patient was positioned supine, given topical throat anaesthesia and a mouthguard and was pre-oxygenated with 4 l/min of nasal O2. The patient was sedated by titration of increments of 1 mg midazolam and 25 mcg fentanyl. The administration of sedation was guided by frontal lobe EEG activity [1] using a bispectral index monitor (Aspect medical systems/Philips, Reigate, UK). In addition to this, standard monitoring done by a dedicated nurse involved performing pulse oximetry, measuring non-invasive blood pressure and performing an ECG. A 20Fr. push-gastrostomy tube designed for endoscopic insertion (Fig. 1) was used. In order to reduce the risk of wound infection from the per-oral passage, 2 g of cefotaxime was given iv prior to the procedure. A 7Fr. vascular Headhunter catheter (Cordis, Johnson & Johnson, South Ascot, UK) and hydrophilic guidewire (Radiofocus, Terumo, Knowsley, UK) were passed through the mouth into the stomach (Fig. 2). 20 mg hyoscine bromide was given iv and the stomach was inflated with room air. The puncture site was identified using fluoroscopy and infiltrated with 10 ml of 1% lidocaine (Fig. 3). Gastropexy was not performed. A small skin incision was made and the stomach was punctured with a sheathed 18G needle from a gastrostomy kit. After the insertion of a wire, a 4Fr. vascular sheath with a haemostatic valve (Radiofocus Introducer, Terumo, Knowsley, UK) was inserted (Fig. 4). The sheath secures access while the valve prevents air from escaping. A 4Fr. Headhunter catheter was inserted through the sheath, and the cardia was cannulated retrogradely with a 0.035”, 260 cm guidewire from the gastrostomy set (Fig. 5). The catheter and the wire were then advanced up the oesophagus and brought out through the mouth. After the removal of the antegrade inflation catheter, a 14Fr. push-PEG (MIC.Kimberly-Clark/Vygon, Cirencester, UK) was advanced per-orally over the wire until the tapered dilator shaft exited through the skin. After the removal of all catheters and wires, the tube was pulled into the stomach and the external fixation disk and connectors were attached (Fig. 6). After 6 hours, water was administered through the tube and feeding commenced the following day.

Discussion:
Per-oral image-guided gastrostomy combines the success rate and versatility of radiologically inserted gastrostomy (RIG) with the robust tubes of endoscopic gastrostomy (PEG) and has shown to be an extremely successful technique [2,3]. This technique does not require gastropexy, thereby reducing the incidence of pain and confusion of ward staff about the removal of sutures. The tubes described have the additional advantage of being designed for
traction removal through the skin, thus avoiding a repeat endoscopy. However, a small proportion due to anatomical position and ageing of tube material, particularly if made of silicone, may still require endoscopic removal. The administration of a single dose of prophylactic cephalosporins recommended for PEG insertion [4] must also be done for this technique, because the tube passes through the mouth. This also carries a small, but documented, risk of seeding of cells from upper GI-tumours into the skin site [5]. In cases where the tumour is curable and the patient requires gastrostomy insertion prior to radical surgery, a percutaneous gastrostomy (RIG) should be performed. PIG gastrostomy has replaced RIG as the standard radiological technique in our department and is now used as a routine alternative to PEG.

**Differential Diagnosis List:** Per-oral image-guided gastrostomy (PIG).

**Final Diagnosis:** Per-oral image-guided gastrostomy (PIG).

**References:**


Figure 1

(a) Description: A 20Fr. push-gastrostomy tube used for the over-the-wire technique. Note the junction (arrow) of the gastrostomy tube to the tapered dilator shaft (arrowheads). Origin:

(b) Description: Top: A 14Fr. tube with a connector hub, clip and external fixation disc. Bottom: An assembled 20Fr. gastrostomy tube. Origin:
Description: The flexible internal bumper, which is designed to collapse on forced traction allowing percutaneous removal. Origin:
**Figure 2**

**Description:** The angled catheter and hydrophilic wire are passed over the back of the tongue. Tracheostomy in situ (arrow). **Origin:**
**Description:** The tip of the catheter lies in the gastric fundus. **Origin:**
Description: The stomach has been inflated, the costal margin is indicated by the contrast syringe. The puncture site is chosen low enough to allow a straight access route to the cardia. This is indicated by the needle and syringe of the local anaesthetic (arrows). Origin:
Description: Lateral screening allows identification of the needle (arrow), the skin line (white arrowheads) and the anterior gastric wall (black arrowheads). Origin:
Description: The stomach is punctured with a sheathed needle, injection of contrast confirms an intra-gastric position. Origin:
Description: The needle is removed and a short guidewire inserted through the sheath.Origin:
Description: Screening confirms the position of the guidewire. Origin:
Description: The needle sheath is exchanged over the wire for the 4Fr. haemostatic introducer sheath.
Origin:
Description: A 4 Fr. Headhunter catheter is inserted through the sheath. Origin:
Description: The tip of the catheter (arrow) is manipulated towards the cardia. Note the vascular sheath (black arrowhead) and the guidewire (white arrowhead). Origin:
Description: The catheter and the guidewire are advanced into the lower oesophagus. Origin:
**Description:** The catheter and the guidewire (arrow) are advanced into the oral cavity under the hard palate, avoiding the nasal passage. The route is indicated by the antegrade inflation catheter (arrowhead). **Origin:**
Description: The catheter and the guidewire are brought out through the mouthguard alongside the 7Fr. inflation catheter. Origin:
Description: After removal of the inflation catheter, the gastrostomy tube with its tapered shaft (arrowheads) is advanced over the guidewire. Origin:
Description: The tube is pushed over the wire until the shaft has exited through the skin site, the wire is removed and the tube pulled down the oesophagus. The internal bumper is seen in the stomach (arrow). Origin:
Description: The dilator shaft appears cut off and the external fixation disc (arrows) attached snugly against the skin, but with enough place to allow for the patients’ movements. The injection of a contrast medium confirms the final position. Origin:
Description: A radiologically inserted push-PEG is seen with external fixation disc, clip and connector attached. Origin: