The Flamingo Set
A New Therapy for the Buried Bumper Syndrome (BBS)

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A New Therapy for the Buried Bumper Syndrome (BBS)

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Introduction
Since 1980, percutaneous endoscopic gastrostomy (PEG) has been an established standard procedure in clinical enteral feeding medicine for patients with neurological deficits, dysphagia, oesophageal carcinoma, short-bowel syndrome and traumatic oesophageal defects (2/3). However, a transcutaneous intragastric feeding tube made of polyurethane plastic, which is implanted in just a few minutes, requires daily care and attention even after placement. Especially peri-interventional and post-interventional antibiotic prophylaxis and daily dressing care with loosening of the tube call for appropriate experience. Consequently, after the first 24 hours it is important to loosen the firm compression of the puncture channel by the internal and external bumpers and prevent, every day, the internal bumper from growing into the gastric wall, by tube mobilisation and rotation through 180-360° (Buried Bumper Syndrome, BBS) (6).

Acute BBS is rare, occurs within up to 4 weeks after implantation and is characterised by a severe clinical course with pressure necrosis, peritonitis or even septic shock.

Chronic BBS occurs within 3-6 months owing to slow ingrowth of the internal bumper of the PEG tube, attributable to pressure-induced ischaemia of the internal gastric mucosa. This process commences only one week after PEG implantation. Subsequent continuous growth over the bumper edges takes place from lateral to central and can even mean complete functional loss due to final occlusion of the internal PEG ostium by the mucosa (7). An insufficient PEG tube that has suffered intraluminal ingrowth has to be removed and replaced by a new one. This type of BBS occurs in up to 2.4 per cent of patients with a mean duration of 18 months (4).

Operative / minimally invasive surgical therapy of BBS is increasingly being replaced by intraluminal endoscopic surgical techniques via the working channel of flexible endoscopes (1). Not only are they less expensive but they also dispense with endotracheal anesthesia. Apart from decapitation of the mucosal surface above the internal bumper using a polypectomy snare and stellate exposure of the bumper using a needle knife or fistulotome, more and more papillotome-based procedures from therapeutic bile duct endoscopy have been used recently (5).

Methodology
A new method offered by the medwork company (Höchstadt/Aisch) is the Flamingo set, which combines the benefits of the papillotome and fistulotome methods and is illustrated below.

Via the external part of the PEG tube that has been shortened to a practicable length, after placement of a 35 gauge guide wire, the extended Flamingo instrument with a total length of 30 cm is introduced to the stomach intraluminally and, following removal of the guide wire, placed in the first curved position by operating the external handle. This creates an inverted U connected by a cutting wire (6/10 mm), whereby the stretched cutting wire is
drawn into the BBS mucosa via the external part of the PEG tube by pulling gently on the instrument and, after the application of current, is cut in the direction of the internal plastic bumper in Endocut mode. It is advisable to make a stellate incision (at least 4x) in order to expose the bumper.

After that the 2nd step is particularly useful. By fixation of the 2nd position on the external handle of the Flamingo instrument the cutting wire contracts and a deep cut is created directly on the surface of the internal plastic bumper, as in endoscopic submucosal dissection.

Under endoscopic control of all the individual treatment steps the exposed bumper can quickly be visualised. Using foreign body grasping forceps from the instrument set, the internal bumper is then dislocated by pulling it into the gastric lumen and can finally be retrieved by retrograde endoscopy without any complications. In the cases we describe below the gripping function was not necessary and all that was required was gentle external pressure (push-and-pull technique; PPT) to push the bumper exposed with the Flamingo instrument into the gastric lumen.

Case analysis

Described below are 3 patients where the last BBS in each case was treated with the Flamingo instrument. This allows an optimal methodological comparison. In all three cases the BBS was severe, with a deeply ingrown bumper and a PEG tube with complete functional loss.

Special attention should be paid to the course of a 70 year-old female patient who had to be treated for BBS a total of three times at intervals of 21, 5 and 24 months respectively after initial implantation. The total time of enteral feeding by PEG was 9 years in a condition following craniocerebral trauma with spastic tetraparesis being the main cause.

The case of a 64 year-old male patient requires critical analysis. The indication for enteral feeding resulted from neurologically induced dysphagia in a condition following bilateral intracerebral bleeding under Marcumar therapy. With this patient a change of PEG tube on account of BBS became necessary for the first time after 3 months, and again after only another 7 months.

Following long-term enteral feeding via a PEG tube lasting 19 months, one 74 year-old male patient suffered minor BBS that was remedied by the push-and-pull technique. After another 15 months the patient was admitted to hospital again with a non-functioning PEG tube and was safely treated for pronounced BBS within 8 minutes using the Flamingo set. One indication for PEG is Fahr’s disease with calcification of the bilateral basal ganglia.

Discussion

The advantage of the Flamingo set is its easy handling. There is practically no risk of perforation owing to safe incision on the surface of the internal bumper. In the three cases we have described the duration of surgical treatment was between 5 and 8 minutes. Placement of a new PEG tube is performed by the transcutaneous retrograde method and is devoid of any problems. It is important to ensure very loose positioning of the internal bumper not too deep in the former buried bumper bed, which is very wide on account of the incision, in order to prevent rapid repetition of ingrowth in conjunction with cicatrisation. The recommended distance between the external bumper and the abdominal skin is approx. 1.5 cm. Judging from the case analyses described, the Flamingo set can certainly be compared with the other methods of treating BBS mentioned and is convincing on account of its easy use with very few complications. In none of the cases did any post-interventional major complications occur, such as heavy
bleeding, perforations, abdominal wall abscesses or generalised infections (6). Despite the bumper having grown very deeply into the gastric wall in some cases, it was possible, by using the Flamingo set, to expose it again in all the cases. Consequently, in none of the cases was any additional minimally invasive surgical procedure required.

To summarise, despite the availability of a now sufficient set for treating BBS, it should be pointed out once again that to prevent BBS it is important to not only exercise nursing diligence but also consider the features of the PEG tube itself (small internal bumper made of hard sharp-edged plastic).

### Literature

4. Lee TH, Lin JJ: Clinical manifestations and management of buried bumper syndrome in patients with percutaneous endoscopic gastrostomy. Gastrointestinal Endoscopy. 2002;56(4);582-584

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<table>
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<th>Product code</th>
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<th>Characteristics</th>
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<td>6/10 mm</td>
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