TECHNIQUE AND IMPORTANCE OF PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN CASES OF CANCER IN THE HEAD AND NECK REGION

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Background

About 35-55% of hospitalised patients are malnourished. Two-third of head and neck cancer (HNC) patients are at a suboptimal nutritional state. Complex onco-radiological therapy and surgical interventions might cause iatrogen malnutrition, worsening the nutritional state. Nutrition-therapy must be an integrated part of tumour treatment. HNC patients represent a distinguished group of tube fed patients.

Supposing that the gastrointestinal (GI) tract is well functioning, tube feeding is advised for cases with dysphagia and/or aspiration or hypercatabolic states. Nasogastric tubes are not optimal for these patients, even for 1 or 2 weeks in the perioperative period.

Gauderer and Ponsky published the technique of percutaneous endoscopic gastrostomy (PEG) in J Pediatr Surg in 1980. PEG is ideal for HNC patients with dysphagia, however the procedure is unsuccessful in 7-10% of cases. This failure rate is due to mouth opening difficulties or stenosis enabling the introduction of an endoscope into the oesophagus. Unique solutions are published for special situations but in general suitable methods are not known. Therefore non-endoscopic PEG-techniques are preferred in the literature, first of all, the radiologically inserted procedure.

A part of HNC patients need only temporary tube feeding in the perioperative period. Only about 2% of PEG literature deals with experiences of PEG removal and most of them are case reports. PEG removal is also a special and disorder specific procedure on HNC patients.

Analysis of a homogenous group of patients, except some PEG fed neurological reports, are still unknown.

Reports on PEG removal – except one paper – are based on only a few cases. Questions regarding PEG removal after prior abdominal surgery were not examined.

Nowadays PEG is worldwide overused but in Hungary we have the problem of underuse.

According to Woodcock, half of patients who received artificial nutritional support had inadequate GI function and in a further 10% there was clinical uncertainty about the adequacy of gut function. An advantage of PEG is that it is possible (and
obligatory, too) to examine the GI mucosa, along with taking mucosal samples. Löser suggests that gastritis and ulcers should be healed before PEG placement.

Undernourished HNC patients bearing several risk factors and living under bad socio-economic circumstances are at high risk for GI mucosal lesions. According to epidemiological data, Helicobacter pylori (H. pylori) prevalence might be higher among them.

There are unanswered questions concerning the timing and composition of artificial nutritional support. Few data are known about the applicability and effect of glutamine (GLN) enriched enteral nutrients.

Aims

The first of my aims was to elaborate in general applicable endoscopical methods for PEG placement, which allows tube insertion on almost all HNC patients. A further aim was to analyse the experiences of 446 PEGs on HNC patients, and to give new information on these homogenous group of patients.

Questions examined were as follows:

1./Are alternate and standard PEG techniques safe? 2./Timing of PEG placement. 3./What type of praemedication is optimal? 4./Is feeding via PEG preferable in the perioperative period to nasogastric tube? 5./When and how should PEG tubes be removed? 6./How should be complications caused by PEG placements and removals be treated? 7./Is prior abdominal surgery a contraindicating factor?

Questions of ethically justified PEG on HNC patients were considered, too.

Mucosal lesions found at the time of PEG placements were registered in that otherwise homogenous group with no GI complaints.

I examined the risk factors causing GI mucosal lesions, the effect of PEG feeding on these lesions and the possibilities of enteral immunonutrition.

Questions examined were as follows:

1./Prevalence of H. pylori in a daily alcohol drinker, heavy smoker, mainly living under bad socio-economic circumstances, but otherwise from typical GI complaints free group of patients. 2./Effect of prior radiochemotherapy (RCH) on mucosal lesions in H. pylori positive and negative patients. 3./Are there PEG placement contraindicating lesions? 4./Timing of artificial
enteral nutrition. Is enteral nutritional support necessary during radio- and/or chemotherapy? Is GLN essential amino acid in HNC patients? Will enterally delivered GLN and arginine (ARG) be absorbed? Do changes of blood amino acid levels result?

Methods

PEG tube placement was performed at Uzsoki Hospital in 446 patients seen from July 1995 until January 2002. PEGs were used for temporary or long term enteral nutrition. Placements occurred under local or general anaesthesia, in the pre-, intra-, or postoperative period.

Alternate routes

When it was impossible to place a mouthpiece between the teeth of a patient the endoscopic was introduced transnasally.

When a standard endoscope could not be passed into the oesophagus because of high-grade obstruction of the upper aerodigestive tract the pharynx was exposed and brought in line with the oesophagus with the help of a Kleinsasser-type straight laryngoscope. The endoscope was passed under direct vision through this instrument and into the upper GI tract.

In cases of a complete obstruction the endoscope was introduced during surgery into the oesophagus by means of the opened pharynx after tumour resection.

Nasogastric tube versus PEG

Data of 171 tube fed (75 PEG and 96 NG) HNC patients were prospectively analysed. General state of patients, occurrence and frequency of postoperative complications, the beginning of the per os nutrition, the learning of safe swallowing and the length of the recovery period were checked.

Based on the type of surgery patients were divided into four groups. Group I: partial larynx or/and partial pharynx resection with local reconstruction (n₁=57, NG/PEG=28/29); group II: total larynx resection and partial pharynx resection with local reconstruction (n₂=32, NG/PEG=25/7); group III: flap reconstruction after total laryngectomy and partial pharyngectomy (n₃=32, NG/PEG=13/19); group IV: oral
cavity or mesopharynx tumour resection with mandible resection and flap reconstruction (n=50, NG/PEG=30/20).

Data processing included analysis of complications after PEG placements and that after removals and of influence of prior abdominal surgery.

Mucosal lesions

Influence of H. pylori, prior radio- and/or chemotherapy were analysed on the development of macroscopical upper GI tract mucosal lesions and that of duodenal villous atrophy. Examination of H. pylori and duodenal villous morphology was done by histology of the biopsy samples.

Effect of tube feeding on the mucosal structure was examined by histology of biopsy samples taken at the time of PEG placement and at the time of tube removal.

Immunonutrition

Eighteen PEG fed HNC patients got through three weeks daily 12gram (approx. 0.23g/kg body weight) GLN and daily 7gram (approx. 0.13g/kg body weight) ARG supplemented or standard nutrient. Serum amino acid chromatograms were examined before starting and at 7. and 14. days of nutrition.

Examining the dynamic of GLN and ARG absorption serum amino-acid levels were measured before and 30, 60 and 120 minutes after consumption of 3 gram GLN and 1,75 gram ARG.

Results

PEG placements were successful in 98,7 per cent of the cases.

Thirty eight per cent (168/446) was carried out under local anaesthesia in the endocopical suite and 62% were performed under general anaesthesia in the operating room. Sixteen per cent was done in the preoperative period, 60% intraoperatively and 24% in the postoperative time. Seventy six per cent of the intraoperative cases were performed before and 24% after tumour resection.
Alternate endocopical routes

In 8.3%, the standard endoscopic procedure was unsuccessful because of impeded access to the oesophagus. In 6 patients the transnasal, in 12 patients by means of a straight laryngoscope and in 15 patients via the opened pharynx method was used.

Nasogastric tube versus PEG

In the first and third groups timing of the beginning of safe per of feeding, the removal of tracheal cannula, the period between the removal of the tracheal cannula and the beginning of the per os nutrition, as well as the realise of the patient home took place significantly earlier in the PEG subgroups. There was no significant difference in the second and fourth groups, but PEG feeding had several advantages in these groups, too.

Complications

No special, HNC related complications were encountered, neither in cases of the standard, nor in cases of alternate endoscopic routes. Minor and major complications are similar to PEG fed patients group other than HNC. PEG complications develop more often after PEG removal, than placement in patients with prior abdominal surgery. Early (<30 days) complications can mainly be treated by conservative therapy, one-third of the in-use complications (>30days) can be treated endoscopically, while two-thirds of complications after tube removal need endoscopical or surgical intervention. In the latest cases there is no place for conservative therapy.

Mucosal lesions

One-third of PEG fed HNC patients were found H. polyri positive.

Development of gastritis, ulcer and oesophagitis increases after RCH therapy, but significant differences are found only on H. pylori positive duodenal ulcer patients.

After irradiation or chemotherapy there is no increase of cases with duodenal villous atrophy, it develops only in H. pylori positive patients after complex RCH therapy.
Effect of PEG feeding on the small bowel mucosa

PEG feeding is effective for healing villous atrophy (p=0.0192). The starting condition and time of nutrition together determine the evolved state (p=0.03; $\chi^2=6.9$), but duration of enteral nutrition does not drastically influence the result.

Enteral immunonutrition

No side effects developed in conjunction with GLN and ARG enriched enteral immunonutrition.

Serum GLN and ARG levels were highest 30 minutes after administration and afterward a decrease started and after 120 minutes blood levels decreased to the baseline.

Before starting artificial nutrition low serum GLN levels were found. Blood glicin, treonin and histidine levels decreased. ARG and triptophan levels were elevated. Apart from histidine all serum amino acid levels normalised after 14 days of nutrition therapy, regardless of the composition of the nutrients.

Substantial findings of theses

1. HNC patients benefit of PEG feeding. Nutritional state and general condition develops, and less complication occurs during oncoradiological treatment if PEG feeding is applied. Nutritional support via PEG tube is as safe for transient use in the perioperative period as for long-term, even for life-long use.
2. PEG is preferable because of several respects to nasogastric tubes. After supraglottic larynx resection, after hemipharyngo-laryngectomy, after total larynx and partial pharynx resection with flap reconstruction feeding via PEG is significantly better in the perioperative period than nutrition via NG tube.
3. With the described alternate endoscopic routes (by means of a straight laryngoscope, via the opened pharynx and transnasally) PEG and other therapeutic endoscopies can be carried out in cases of trismus or in cases with stenosis in the region of the oesophageal inlet. Using the mentioned alternate techniques success rate of PEG placement increases up to other non-endoscopic PEG methods in HNC patients, too.
4. Timing of PEG placement in HNC patients depends on the nutritional state and on the complex tumour-therapy needed.

5. Therapy of PEG complications is mainly conservative treatment or endoscopical procedure. Surgery is needed rarely. PEG complication after ‘cut-and-push’ type tube removal is twice of that of PEG placement. In cases with prior abdominal surgery endoscopical PEG removal is suggested.

6. In the development of upper GI tract mucosal lesions the malignancy itself, malnutrition, bad life style and eating habits, H. pylori or RCH therapy play a role in HNC patients. H. pylori prevalence is not higher in HNC patients, than in average.

7. For HNC patients GLN becomes essential amino acid.

8. GLN and ARG enriched enteral immunonutrition has positive effect on the recovery of HNC patients, provided that an adequate dose is administered for enough time.

9. HNC patients are not an absolutely homogenous group of patients, because the effect of nutrition therapy depends on the degree of malnutrition, on how extensive the tumour is and what combination of radio-chemotherapy and surgery is needed.
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List of papers


46. Sebesi J, Simig M, Taller A, Iliás L: Helicobacter pylori and NSAIDs. Digestion 1998; 59 (Suppl. 3.)