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New method for ambulatory intubation of nonresectable oesophageal tumours. Experiences in 247 consecutive cases

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Palliative treatment of oesophageal tumours represents an unsolved problem, a field of controversies focused on cost–benefit relation. As a consequence of the continually rising number of advanced oesophageal malignancies in Hungary, enhanced requirements for tube insertion to maintain swallowing capacity emerged at our unit during the late 1980s. In 1990 a new method for tube insertion was elaborated and introduced. Continuous dilatation by an Eder-Puestow device, followed by endoesophageal tube placement with the help of a rigid oesophagoscope under X-ray control enabled us to apply this method routinely as an ambulatory procedure. Two hundred and forty-seven patients were treated, 196 cases underwent 'same day' interventions without hospitalization and a further 51 patients had been admitted earlier for diagnostic purposes. No lethal complications occurred. Twenty-seven patients with oesophagobronchial fistulas were treated successfully; 19 of them ambulatorily. The complications experienced were: perforation (1), tube displacement (7), obstruction (6) and bleeding (2). Comparing our earlier experiences with tube insertion via gastrotomy ('pull through' method) to this new method, the latter shows the following advantages: (a) no direct mortality, (b) low postoperative morbidity, (c) minimal complication rate, and diminished hospital costs up to 95%. Tube implantation promotes intracavital afterloading radiotherapy of tumours. Results in 62 patients show improvement of survival rate from 5.5 months (controls) to 11.7 months respectively.

Key words: Oesophageal carcinoma, endoscopic palliation, intracavital irradiation, ambulatory method

Most patients with oesophageal cancer present at a late stage of the disease, when there is a gross and incurable spread of tumour beyond the oesophagus. Because long-term survival is rare, palliation of dysphagia is the major consideration in management with cure being an added bonus. Resection of the tumour with restoration of alimentary continuity offers the best palliation. Resection however is possible in less than 50% of patients[1,2]. Bypass procedures using colon[3], jejunum[4], or stomach[5] give unsatisfactory results with significant mortality.

Pulsion intubation will relieve dysphagia and offers the additional benefit of simple execution and rapid effectiveness. This type of palliation seems to be suitable for ambulatory surgery. We report a prospective study of a new endoscopic method for treatment of inoperable malignant oesophageal strictures (Table 1).

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Patients and methods

Patient selection

A total of 243 consecutive cases with nonresectable carcinoma of the oesophagus and four elderly patients (aged from 86–93 yr) suffering from reflux stenosis were treated by endoscopic intubation between 1987 and 1992 (Table 2). Non resectability was indicated by the following criteria: (a) Invasion of the trachea or bronchi (n = 81); (b) Oesophagotracheobronchial fistula (n = 27); (c) Distant metastases (n = 78); (d) Mediastinal invasion (operative finding) (n = 28); (e) Local recurrence after surgery (n = 10); (f) Contraindication for surgery (age, general condition, pulmonary or cardiac complication) (n = 29).

No patient presenting with documented oesophageal malignancy was excluded from the study. The mean age of the patients was 57.8 yr (range 38–85 yr), the male : female ratio was 5 : 1.

Patient assessment

The local extent of the tumour was determined by X-ray swallow, chest radiography, fibreoptic endoscopy and bronchoscopy. The operated patients underwent media-

Table 1. Method of oesophageal intubation for oesophageal stenoses

1. X-ray control	
(a) localization	
(b) length	
(c) characterization	
(d) swallowing	
2. Dilatation	continuous X-ray monitoring
(a) guide wire introduction	
(b) dilatation up to 45 Ch.	
(c) internal sheath insertion	
3. Tube preparation	
4. Tube placement	
5. X-ray swallow	
6. Discharge	
7. 6 weeks control	

Table 2. Indication for oesphageal intubation (n = 247)

Oesophageal carcinoma (without complication)	
upper third	48
middle third	121
distal third (or cardia)	37
Oesophageal carcinoma (with bronchial fistula)	27
Postoperative (anastomotic stenoses)	
oesophagogastric (neck)	6
oesophagogastric (thoracic)	1
oesophagojejunal (abdominal)	3
Reflux stenoses (age: 86–93 yr)	4
Intubation and intracavital irradiation	62

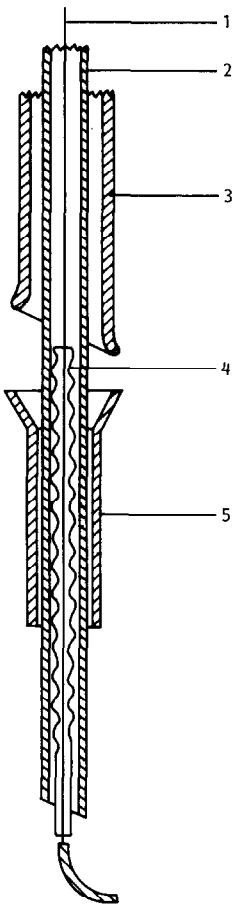


Figure 1. Sketch of the procedure. 1. guide wire; 2. plastic tube; 3. rigid oesophagoscope; 4. semiflexible shaft of Eder-Puestow device; 5. Rüsch tube.

stinal computed tomography (CT). CT was not accepted as adequate for determination of local inoperability. Histological diagnosis was obtained in all patients. Distant dissemination was sought by ultrasound and CT.

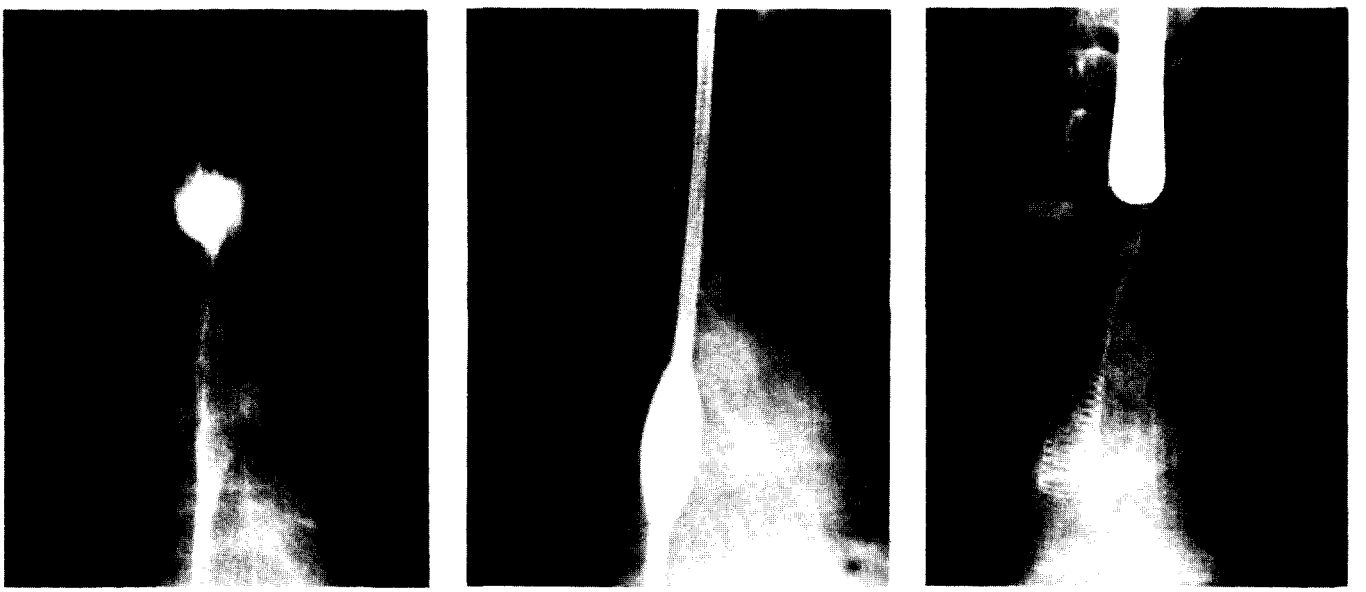
Method

First the exact location of the lesion, including length and degree of the stricture was determined under X-ray control. The upper margin of the stricture was marked by a metal plate placed on the chest wall. The guide wire of the Eder-Puestow dilatator set (Keymed-Olympus) was introduced downward into the stomach (Figure 2a). This step required an upright position, then the X-ray table was positioned horizontally. Dilatation over the guide wire using metal olives was carried out up to 45 Ch. (Figure 2b). Having removed the olives, the semiflexible metal shaft of the device, covered with a plastic tube with a diameter of 30 Ch. was introduced into the stomach over the guide wire. The assistant held the internal tubes straight, which guided the Häring (Rüsch) prosthesis. The outer shaft of a rigid oesophagoscope (Storz) was used to push the prosthesis over the internal conduit, consisting of the guide wire, semiflexible metal shaft and plastic tube (Figure 1). The exact positioning is helped by the indication mark. While holding the prosthesis in the proper position with the oesophagoscope, the guiding device was carefully removed. Then, under gentle rotation, the oesophagoscope was disengaged from the endoprosthesis and removed (Figure 2c). An immediate X-ray swallow in the upright position was performed to control the situation (Figure 3), and the thorax underwent fluoroscopic checking. When the passage was adequate, the patient was ready to eat and was discharged after an observation period of 1–2 h.

The length of the prosthesis used by us was 9–12–18 cm, but it is possible to cut the tube according to the required size.

Intracavital irradiation: 62 patients underwent intracavital irradiation after loading radiotherapy (MEV Curietron) after endoscopic intubation. A ^{137}Cs energy source was applied. According to the tumorous mass the doses were calculated by a computerized program (isocentric method, Varyter-XT) offering an effective tumour dose of 15 Gy during 24 h. This session was repeated two or three times, resulting in a total dose of 45–60 Gy.

Pull-through intubation: The results of ambulatory endoscopic intubation were compared with a historical series of 54 patients, having been operated between 1985 and 1989 for unresectable oesophageal cancer. The Rüsch tube was placed via gastrotomy. Mean age of this group was 56.7 yr (range 42–77 yr), male : female ratio was 5 : 1.



a b c

Figure 2. **a**, Guide wire introduced into a near complete malignant stricture in the upper third of the oesophagus; **b**, Dilatation using Eder-Puestow device; **c**, Tube insertion with help of a rigid oesophagoscope.

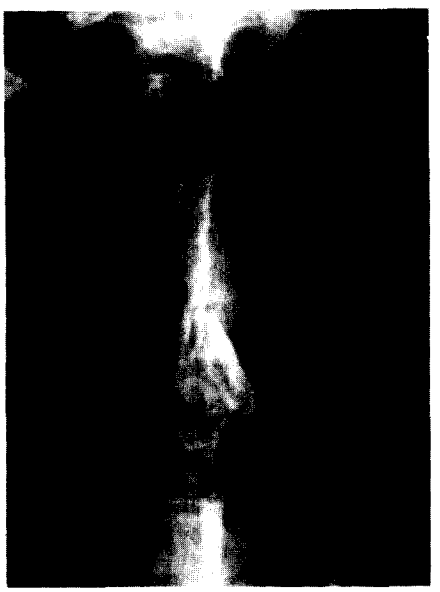


Figure 3. Gastrographine swallow showing oesophagotracheobronchial fistula. Note the extended necrosis of the esophageal wall: the ingested contrast material fills the left bronchial tree.

Figure 4. After tube insertion gastrographine swallow shows a proper placement: contrast material flows unimpeded into the stomach

Results

Complications are listed in Table 3. No lethal complications occurred. The patient in whom the guide wire caused perforation through the tumour mass was successfully intubated and had an uneventful postoperative course having been given antibiotics to prevent mediastinitis. Two malpositions required removal of the tube, but in both cases successful reintubation was performed. Two patients with malignant stricture in the upper mediastinum experienced severe pain after tube insertion, so both prostheses should have been removed by endoscope. In three patients with tumour of the cardia, infiltrating the lesser curvature of the stomach, a proper tube placement was impossible.

Late complications occurred in 7.8% of the successfully intubated 242 patients. In nine cases the prosthesis slipped down. Six were removed from the stomach using fibroscope, three patients were operated and the tube was removed surgically from the ileum. No deaths occurred. It is important to note that in both cases with reflux stenosis the tube remained in the proper position for only 1 or 2 weeks, then X-ray control demonstrated displacement to the stomach. Severe bleeding occurred in four

Table 3. Complications

	n	Deaths
Early		
perforation	1	–
malpositioning	2	–
pain (removal)	2	–
technical failure	3	–
Late		
dislocation (distal)	7	–
obstruction	6	–
bleeding	2	2
Intubation and intracavital irradiation		
dislocation (distal)	2	–
bleeding	2	2

patients: two in the irradiated group. All patients died in haemorrhagic shock and/or aspiration.

Survival of the patients is shown in Figure 5. Mean survival of patients after endoscopic intubation was 7.2 months, better than those without tube insertion (5.5 months[6]), but the difference is not significant. Patients given afterloading radiotherapy have a significantly better late survival of 11.7 months.

Figure 6 compares the conventional surgical placement of prosthesis with the results of endoscopic intubation. The 23.7% mortality and 43.6% complication rate of surgical intubation is significantly higher than those of the group of endoscopically intubated patients (0 and 2.8%). The success rate is the same. Hospital stay for the operated group was 24.6 days. Calculating 1 day for ambulatory procedures, mean hospital stay for the 'push through' group was 1.7 days. The estimated costs for the endoscopic group are 14.1% of those for the patients who underwent surgery. The costs for the ambulatory procedure itself represent only 5% of the expenses for the conventional 'pull through' method.

Discussion

For patients with unresectable oesophageal carcinoma palliation of dysphagia is the prime objective of treatment. The place of radiotherapy has been imprecisely defined with up to 50% of patients requiring subsequent dilatation for aggravation of dysphagia[7]. Where tumours of the upper thoracic oesophagus have infiltrated the airway, radionecrosis will hasten the development of an oesophagorespiratory fistula[4,8].

Reopening of the obstructed lumen can also be achieved with Nd:YAG laser photocoagulation. It is particularly indicated in cases in which a prosthesis is less suitable (cancer is overgrowing the tube, tumour is excessively soft, when tumour infiltrates the upper sphincteric area, etc.). A major disadvantage of laser therapy is that several sessions are necessary, and the palliative effect is short-lasting; dysphagia recurs after 3 to 5 weeks[9,10].

Bypass procedures have their proponents and the preferred organ is the stomach[11]. Postoperative complications, significant mortality rate and poor improvement of nutritional status after gastric bypass make this procedure controversial.

Intubation of the oesophagus offers a satisfactory solution to a difficult problem. Tubes may be inserted by traction[12–14] or pulsion.[15–17] The latter seems to be favoured[18,19]. A prosthesis can usually be placed anywhere in the upper gastrointestinal tract, provided the stricture is of circular shape and provided proper prior dilatation can be carried out. It is usually well tolerated with no sensation of the presence of a foreign body, if the proximal funnel rim is located at least 2 cm distal to the upper oesophageal entrance[20]. Small tumours formatting severe stenosis can cause intolerable pain after intubation (see complications, Table 3). Furthermore, a prosthesis can be positioned at the gastroesophageal junction, provided measures are taken to prevent reflux. The guide wire should be introduced correctly, but depending upon the extent of tumorous infiltration of cardia, the proper positioning of the prosthesis can be extremely difficult, or sometimes impossible (three cases out of our 247).

Difficulties may be encountered during insertion of a prosthesis in the presence of sharp angulation due to tortuous tumour growth, previous surgery, or severe kyphoscoliosis. The insertion of the prosthesis is facilitated by using the Eder-Puestow device which stiffens and straightens the dilatation and insertion path. The use of the external plastic tube on the semiflexible shaft prevents unnecessary movement or kinking of the prosthesis. The metal coils in the wall of the Häring tube offer the required stability and flexibility for the 'push through' method[6,12].

Perforation is a major life-threatening complication. A rate of around 6–8% seems to be a feature of fibreoptic intubation[15,16,21]. Tube insertion by rigid oesophagoscope after previous dilatation with the Eder-Puestow device as practised by us has been proved much safer, with less than a 1% perforation rate. The critical step is the proper placement of the guide wire, once correctly introduced, dilatation and subsequent intubation under X-ray control is usually successful.

The 'push through' method for placement of a prosthesis is less time consuming than conventional surgical intubation. The method presented in this article is suitable for ambulatory surgery, as dilatation and tube insertion is performed in one session, even in the case of oesophagorespiratory fistula. Any type of prosthesis suitable for the 'push through' method can be used for intubation with special regard to the rigidity and flexibility of the tube. In general, the patient needs no hospitalization, provided X-ray control shows correct palliation of malignant dysphagia. We believe that giving adequate information to the patient is mandatory for assessing late complications, requiring subsequent control at the outpatient unit.

The cost saving effect of this method is as evident as that of any other form of successful ambulatory surgical intervention.

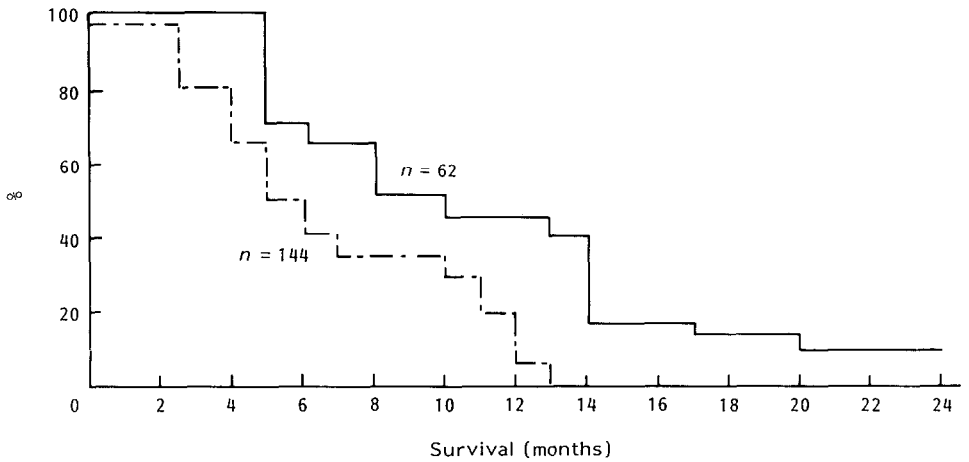


Figure 5. Survival after endoscopic intubation for malignant oesophageal stricture with (——) and without (–·–·–) postoperative radiotherapy.

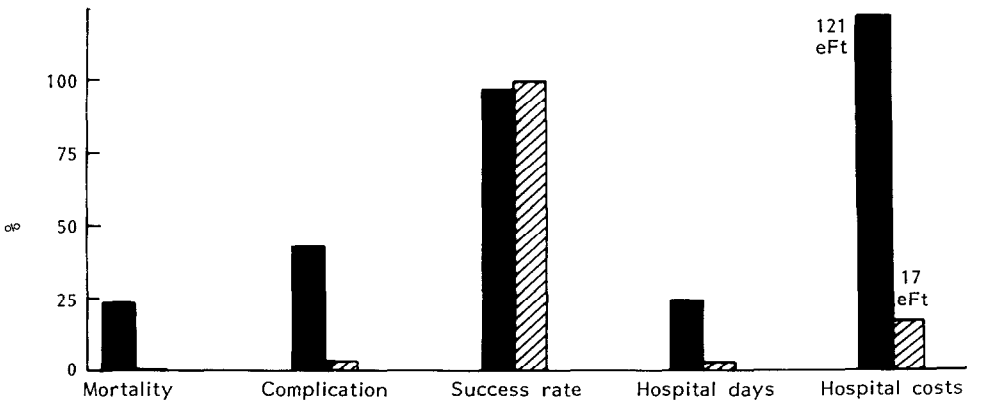


Figure 6. Comparison of "pull through" (surgical), ■, and "push through" (endoscopic), ▨, methods for oesophageal intubation.

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