Palliative esophageal stent placement using endoscopic guidance without fluoroscopy

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SUMMARY

Aims — Fluoroscopy is not available in every endoscopic unit. This situation leads to delays in treatment or to transfer of patients to other centres for stent insertion. We assessed safety and effectiveness of expandable esophageal metal stent placement under endoscopic control without fluoroscopy using a thin gastroscope.

Patients and methods — From October 2002 to June 2004, thirty-three consecutive patients have been included for esophageal stent placement under endoscopic control alone with a nasogastroscope (5.9 mm). A proximal release covered stent (Ultraflex; Boston Scientific Micrvasive) was used. Indications were malignant esophageal stricture (N = 26), malignant extrinsic compression (N = 2) and esophago-respiratory neoplastic fistula (N = 5).

Results — Stent placement using endoscopic control alone was successful in 30/33 (90%) patients. Complications occurred in 11 patients. Early complications (< 7 days) included one death from pulmonary embolism, severe retrosternal pain needing transient morphinic treatment (N = 2) and GERD despite antisecretory therapy (N = 1). Late complications included: food impaction (N = 1), tumour overgrowth-related obstruction of the stent (N = 5) and one late esophageal-respiratory fistula at 4 months at the proximal end of the stent. Relief of dysphagia was obtained for all patients at 48 hours and dysphagia score decreased from 3.1 before stent to 1.2 at 1 month (P < 0.05).

Conclusion — Expandable esophageal stents can be accurately and safely placed using endoscopy with a thin gastroscope. This method obviates the requirement of fluoroscopic access, lacking in many centres, and avoids exposure to X-ray.

RÉSUMÉ

Le traitement palliatif des cancers de l’œsophage par mise en place d’une prothèse œsophagienne sous contrôle endoscopique seul

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Objectif — L’accès à une salle de radioscopie est limitée dans certains centres et peut conduire à un retard de prise en charge ou à un transfert du malade pour la pose d’une prothèse œsophagienne. Le but de cette étude a été d’évaluer l’innocuité et l’efficacité de la pose d’une prothèse œsophagienne sous contrôle endoscopique seul par un nasogastroscope.

Malades et méthodes — D’octobre 2002 à juin 2004, la pose palliative d’une prothèse œsophagienne métallique expansive couverte (Ultraflex à libération proximale; Boston Scientific Micrvasive) a été évaluée chez 33 patients consécutifs sous contrôle endoscopique seul avec un nasogastroscope (5,9 mm). Les indications comprenaient une néoplasie sténosante de l’œsophage (N = 26), une compression extrinsèque maligne (N = 2) et/ou une fistule œso-respiratoire d’origine maligne (N = 5).

Résultats — La pose d’une prothèse sous contrôle endoscopique seul a été possible chez 30/33 (90%). Des complications sont survenues dans 11 cas. Les complications précoces (< 7 jours) comprenaient le décès d’un malade d’une embolie pulmonaire massive, des douleurs rétrosternales intenses nécessitant un traitement morphinique (N = 2) et un RGO persistant malgré la prise d’antisécrétoires. Les complications tardives comprenaient: une obstruction de la prothèse par des aliments, un envahissement tumoral extra-prothétique (N = 5) traité par pose d’une nouvelle prothèse (N = 4) ou par coagulation au plasma argon (N = 1) et une fistule œso-respiratoire à 4 mois à l’extrémité proximale de la prothèse. La dysphagie était améliorée chez tous les patients à 48 heures. Le score moyen de dysphagie était de 3.1 avant la pose et de 1,2 à 1 mois.

Conclusion — La pose d’une prothèse œsophagienne à libération proximale sous contrôle endoscopique seul avec un nasogastroscope est une procédure sûre et efficace qui permet de pallier la carence de certains centres en matériel de radioscopie et évite l’exposition aux rayons X.

Introduction

Prognosis in patients with esophageal cancer remains poor despite therapeutic progress, with a 5-year survival rate from 5 to 10% [1]. Dysphagia is the main symptom and leads to weight loss. Palliative treatment of dysphagia with self-expanding metal esophageal stent (SEMS) is considered to be the procedure of choice improving quality of life until death [2-11]. SEMS placement can be also an emergency procedure in patients with perforation or fistulae [12, 13]. SEMS is preferentially chosen rather than plastic stent for its lower morbidity and higher efficacy [14, 15]. Most SEMS have a distal release system and thus, require both endoscopy and fluoroscopy to be safe. SEMS with proximal release systems (Ultraflex, Boston Scientific Corporation, Natick, Mass, US) allows by its initial proximal deployment, a stent insertion under endoscopic control alone, by a permanent placement under endoscopic control alone with a nasogastroscope (5.9 mm). A proximal release covered stent (Ultraflex; Boston Scientific Micrvasive) was used. Indications were malignant esophageal stricture (N = 26), malignant extrinsic compression (N = 2) and esophago-respiratory neoplastic fistula (N = 5).

Results — Stent placement using endoscopic control alone was successful in 30/33 (90%) patients. Complications occurred in 11 patients. Early complications (< 7 days) included one death from pulmonary embolism, severe retrosternal pain needing transient morphinic treatment (N = 2) and GERD despite antisecretory therapy (N = 1). Late complications included: food impaction (N = 1), tumour overgrowth-related obstruction of the stent (N = 5) and one late esophageal-respiratory fistula at 4 months at the proximal end of the stent. Relief of dysphagia was obtained for all patients at 48 hours and dysphagia score decreased from 3.1 before stent to 1.2 at 1 month (P < 0.05).

Conclusion — Expandable esophageal stents can be accurately and safely placed using endoscopy with a thin gastroscope. This method obviates the requirement of fluoroscopic access, lacking in many centres, and avoids exposure to X-ray.
endoscopic follow-up of its release through the stricture. This procedure is interesting because access to fluoroscopy is limited in many centres and can lead to delay in treatment and many patients are transferred for SEMS insertion. Furthermore, repetition of examinations requiring fluoroscopy exposes medical staff to X-rays. The aim of this study was to evaluate safety and efficacy of a simple procedure of SEMS placement under endoscopic control alone.

**Patients and methods**

**Patients characteristics**

From October 2002 to June 2004, SEMS placement under endoscopic control alone was attempted among 33 consecutive patients aged 47 to 92 years (mean age, 68.2; 22 men). Informed consent was obtained from all patients. Since November 2003, eight patients with cancer of esophago-gastric junction were included in an other study evaluating anti-reflux SEMS and thereby excluded from the present study. All SEMS were placed by 2 endoscopists (EBS, MA). Indications were: palliative in patients with malignant esophageal stricture (N = 26), malignant extrinsic compression (N = 2) or neoplastic esophago-respiratory fistulae (N = 5). Histological examination confirmed malignancy in all patients (23 squamous cell carcinomas, 10 adenocarcinomas). Site of obstruction was upper (N = 8), middle (N = 13), and lower (N = 12) third of the esophagus. SEMS placement was the only therapeutic option in 13, following (N = 17) or preceding (N = 3) chemo-radiotherapy. Mean dysphagia score was evaluated before and one month after SEMS insertion according to Atkinson’s score: grade 0 = ability to eat a normal diet; grade 1 = ability to eat some solid food; grade 2 = ability to eat some semi-solids only; grade 3 = ability to swallow liquids only; grade 4 = complete dysphagia [16]. Early (< 7 days) and late complications (> 7 days) were recorded in the follow-up.

**Endoscopic procedure**

The procedure used a covered SEMS with proximal release (Ultraflex, proximal release; Boston Scientific Corporation, Natick, Mass. US). SEMS were 10, 12 or 15 cm in length and 23 or 28 mm in diameter. The length and diameter of the SEMS were selected according to size and site of obstruction. A 10-cm stent was chosen for strictures measuring less than 4 cm at endoscopy, a 12-cm for those from 5 to 7-cm and a 15-cm for those longer than 8 cm. A 23-mm diameter stent was selected for the upper third to allow complete deployment of its proximal end, a 23 or 28-mm for the middle or lower third of the esophagus. SEMS placement was systematically carried out under general anaesthesia (propofol). A nasogastroscope (Olympus XP 160; 5.9 mm diameter) was used to allow when possible endoscopic crossing of the stricture, measurement of its length and introduction of the Savary guide wire (Keymed) in the stomach. In three procedures, the nasogastroscope was not available, and we used a pediatric gastroscope (Olympus XP20; 8.5 mm). Previous dilation with Savary bougienage (Wilson Cook) up to 11 mm was carried out if necessary when stenosis was considered too tight by the endoscopist. Esophageal SEMS with proximal release was then introduced over the guide wire and deployed under permanent endoscopic control after reintroduction of the gastroscope alongside the SEMS (figure 1). After stent deployment the same endoscope was gently passed into or out of the stomach to assess patency and position. Failure of procedure was considered if fluoroscopy was needed to perform the procedure. Esophageal radiographic contrast was always performed at day 1 to verify position, patency and possible complication of the SEMS. To avoid food impaction, gaseous water was recommended after each meal and proton pump inhibitor therapy was systematically introduced after SEMS placement.

**Results**

SEMS placement under endoscopic control alone was successful in 30/33 patients (90%). In 3 patients, the endoscopist was unable to place the guide wire in the stomach and measurement of stricture length without fluoroscopy was impossible due to a very tight and sinuous stricture. Mean stricture length was 7.15 cm (range: 2-12 cm). Previous bougienage dilation was needed in 20/33 patients (60%). SEMS lengths of 10 cm (12 patients), 12 cm (17 patients) and 15 cm (9 patients) were used. Complications occurred in 11 patients. Early complications included persistent GERD symptoms after PPI therapy (N = 1), severe retrosternal pain needing morphine analgesia (N = 2) and one death caused by pulmonary embolism. Late complications included food impaction (N = 1), tumour overgrowth obstruction of the stent (N = 5) (figure 2) treated by a second SEMS under endoscopic control alone in 4 patients and argon plasma coagulation in one. One late esophago-respiratory fistula, at the proximal end of the stent, occurred 4 months later (figure 3). No stent migration occurred even in patients treated with chemo-radiotherapy. Swallowing was improved in all patients at 48 hours. Mean dysphagia score for the 23 patients for whom 1 month follow-up data were available was 3.1 before and 1.2 after SEMS placement (P < 0.05). During the follow-up, 38 SEMS placements were carried out in the 33 patients. Thirty-five of 38 SEMS (92%) were performed without fluoroscopy.
Discussion

Esophageal SEMS placement is usually performed under endoscopic and fluoroscopic control. Fluoroscopy is used to guide progression of the wire into the stomach, to place external radio-opaque markers at the two ends of the stricture, and finally for SEMS deployment. In our study, we showed that SEMS insertion under endoscopic control alone with a nasogastroscope is a simple and effective method. This procedure can be performed in the endoscopy room and thereby allows reduction of fluoroscopic time. Furthermore, lack of fluoroscopy equipment is frequent and results in transfer of patient for SEMS placement. In addition, SEMS under endoscopic control appears more reliable than under fluoroscopic control, which has number of drawbacks. External skin markers are conventionally used to delimit the proximal and distal end of the stenosis, but are inaccurate due to frequent errors of parallax, particularly during patient respiratory movements. Submucosal injection of radiographic contrast agent overcomes the problem of parallax, but in our experience, submucosal injection diffuses far from the injection point and results in imprecise fluoroscopic landmarks of the stricture. In our study, we used bougienage rather than balloon dilation, because we believe that in this situation, it allows better perception of tumoral tissue resistance during the procedure. Moreover it is less expensive than balloon dilatation. Two previous studies have shown safety and efficacy of SEMS insertion with primary distal release without fluoroscopy after addition of a colored marker at the proximal end of the stent [17, 18]. Endoscopic procedures, results and complications between these 3 studies are summarized in table I. In our study, SEMS placement did not require use of a colored marker, because we only used a SEMS with primary proximal release which allows for constant endoscopic control of its deployment. The main limit of this method was endoscopic crossing of the stricture to allow safe passage of the guide wire in the stomach, before dilation or SEMS insertion. For this reason in contrast with the two previous studies when possible we used a nasogastroscope (5.9 mm diameter) to pass through the stenosis. This procedure combining a nasogastroscope and a proximal stent release had not previously been reported in the literature. This new generation of small caliber endoscopes offers a simple and safe evaluation of the stenosis and allows dilation of tumoral stenosis without fluoroscopy. Moreover, the use of a proximal release SEMS allows safe placement of the stent under endoscopic control alone. However, in 10% of cases, fluoroscopy remains necessary to cross tight and sinuous strictures. Preliminary esophageal opacification with radiographic contrast, even if it was not systematically carried out in this study, could facilitate selection of patients requiring fluoroscopy, particularly in case of complete stenosis without any passage of the contrast. All SEMS were successfully inserted without any malposition with this procedure. Complica-

Table I. – Comparison between procedures, results and complications of stent insertion under endoscopic control alone.

Comparaison entre les différentes études des procédures, résultats et complications de la mise en place de prothèses sous contrôle endoscopique seul.

<table>
<thead>
<tr>
<th>N</th>
<th>Endoscope diameter</th>
<th>Choice of stent</th>
<th>Success rate</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin et al. [17]</td>
<td>30</td>
<td>10.5 mm</td>
<td>uncovered Ultraflex distal or proximal release</td>
<td>77%</td>
</tr>
<tr>
<td>White et al. [18]</td>
<td>70</td>
<td>12.8 mm</td>
<td>Wallstent (N = 30) Ultraflex (N = 40) distal or proximal release</td>
<td>100%</td>
</tr>
<tr>
<td>Ben Soussan et al.</td>
<td>33</td>
<td>5.9 mm</td>
<td>Ultraflex with proximal release</td>
<td>90%</td>
</tr>
</tbody>
</table>
tions occurred in 27% and tumour overgrowth obstruction was the most frequent complication of covered SEMS, as in previous reports [4-13]. One esophago-respiratory fistula occurred 4 months after SEMS insertion without any evidence of malignant recurrence at the site of the fistula. This late complication is rare and resulted from pressure necrosis caused by the proximal end of the SEMS [19].

In conclusion, combination of a thin gastroscope and esophageal SEMS with proximal release allows for safe, simple and effective esophageal stent insertion without fluoroscopy. This technique avoids exposure to X-rays and allows palliative stent insertion in units with limited access to fluoroscopy.

REFERENCES