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Through-the-scope stent for malignant gastric outlet obstruction

內窺鏡支架法治療惡性胃出口阻塞

This report is of the technique and results for through-the-scope stent in palliating malignant gastric outlet obstruction for 17 patients. All procedures were done using conscious sedation and fluoroscopy. Enteral Wallstents with a diameter of 20 mm or 22 mm and length 60 mm or 90 mm were used and delivered over a guidewire through an endoscope with an operating channel of at least 3.7 mm. A total of 18 stents were placed. One stent failed to be deployed. One stent migrated and required insertion of a second stent. One patient required repeat endoscopy to stop bleeding from the tumour. Through-the-scope stent relieved obstructive symptoms for 14 (82%) patients. The median dysphagia score improved from 4 to 2 after through-the-scope stent (P=0.001). The median overall survival and hospital-free survival time was 6 weeks (interquartile range, 3-9 weeks) and 4 weeks (interquartile range, 1-7 weeks), respectively. To conclude, through-the-scope stent was safe and feasible, offering an alternative minimal invasive method to palliate obstructive symptoms for patients with inoperable tumours causing gastric outlet obstruction.

本報告報導有關17名病人為減輕惡性胃出口阻塞，接受經內窺鏡放置支架手術的技術和結果。所有步驟均在輕度鎮靜及X光監視下進行。我們利用導線通過3.7毫米的內窺鏡工作通道把Enteral Wallstents (直徑為20或22毫米，長度為60或90毫米)傳送及放置。共安裝了18個支架。一個未能正確擺放。一個支架出現移位，需插入第二個支架。一名患者需要重做內窺鏡檢查以阻止腫塊流血。手術後，14名(82%)病人的阻塞徵狀呈現緩和；吞咽困難的中值等級從4改善到2 (P=0.001)；中值總存活時間和出院存活時間分別是6週(範圍， 3-9週)和4週(範圍， 1-7週)。總括來說，經內窺鏡放置支架的方法是安全和可行的，它提供了另一個微創方法，為有腫瘤、不宜做手術、和患上胃出口阻塞的病人減輕阻塞徵狀。

Key words:
Endoscopy;
Gastric outlet obstruction;
Stents

關鍵詞：
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Introduction

Traditionally, surgical by-pass (gastrojejunostomy) was the only treatment option for patients with malignant gastric outlet obstruction caused by inoperable intrinsic or extrinsic tumours. Gastrojejunostomy requires general anaesthesia and often carries significant morbidity due to the poor general health of patients.[1] The introduction of a self-expanding metal stent in the early 1990s to re-establish luminal patency of the gastrointestinal tract offered an alternative treatment option for patients who were otherwise not candidates for surgery.[2-4] These stents, however, were largely tailored for placement in oesophageal obstruction. The delivery systems of the stents were either too wide or too short for use across the antral-pyloric or duodenal regions.[4] Another problem was the excessive looping of the deployment system inside the dilated stomach. Recently, a through-the-scope enteral stent (TTSS) was introduced[5] with the advantage of stent placement via the operating channel of an endoscope so as to solve the looping problem. This is a report of the technique and results of TTSS in a prospective series of patients with malignant gastric outlet obstructions.

Technique

The procedure was done using fluoroscopic and endoscopic guidance and conscious sedation using intravenous diazemuls and pethidine. The Enteral

Wallstent (Schneider, Minnesota, US), which came in three diameters of 18 mm, 20 mm, or 22 mm with a length of 60 mm or 90 mm, was used. The larger diameter stent was preferred to get a better luminal patency. The stent was embedded into a Unistep delivery system that has a diameter of 3.6 mm. Therefore, to deploy the stent via an endoscope, an operating channel of at least 3.7 mm was needed. A therapeutic forward-viewing endoscope (2T10 series; Olympus, Tokyo, Japan) was used for this purpose since it has an operating channel of 4.2 mm.

After identifying the obstruction under direct endoscopic view, a standard 0.035-inch Zebra guidewire (Microvasive, Massachusetts, US) was inserted across the obstruction site using fluoroscopy. In difficult situations where the lumen was hard to locate or pass through, a round tip cannula with contrast injection helps with guidewire insertion. The extent of the obstructive site could also be assessed by contrast injection at this stage. The stricture was not routinely dilated to allow the scope to pass through. After placement of the guidewire across the stricture, the stent could be advanced over the guidewire into the stricture. The extension tube of the delivery system needed to be primed with an abundance of saline for a smooth delivery. The endoscope was then reduced to a relatively straight position to allow the distal portion of the stent to pass through the stricture. Looping of the endoscope would make it difficult to pass the stent through within the operating channel, while it would be easier to deploy and adjust the stent when the tip of endoscope was as close to the stricture as possible. The coverings of the delivery system were pulled back to deploy the stent once the position was confirmed. It was important to adjust the stent position during delivery as the stent had the tendency to fall away. The delivery system was used to adjust the stent position even when it was half-way deployed.

The complete procedure should be done using continuous fluoroscopy screening. Once the stent was deployed, it was possible to check the patency by injecting contrast agent (Fig). We did not routinely pass the endoscope into the stent lumen to check for patency as the stent could take some time to achieve full deployment.

Subjects and methods

From September 1998 to March 2001, selected patients were recruited to undergo TTSS for palliative gastric outlet obstructions. These patients had inoperable tumours with obstructive symptoms at presentation, and were either unwilling to undergo surgery or were not fit enough for surgery. All procedures were done using conscious sedation. After the procedure, all patients were monitored in surgical wards. Patients were allowed home or discharged to hospice care after satisfactory symptom control and oral intake was achieved. Outcome measures included percentage of symptom relief, dysphagia score (1=regular diet; 2=semi-solid diet; 3=liquid diet; 4=water/saliva only), and overall and hospital-free survival.

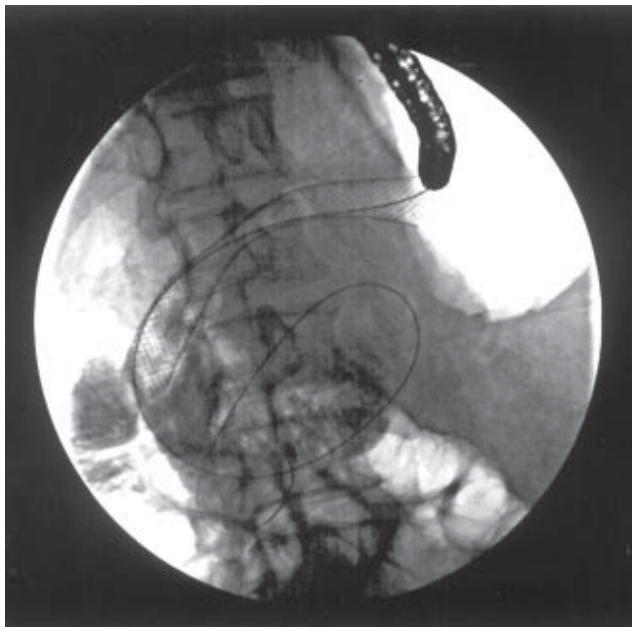

Fig. Fluoroscopic view after placement of an Enteral Wallstent with guidewire

Results

During a 30-month period, 17 patients (11 men and 6 women) with a median age of 60.50 years (interquartile range [IQR], 56.00-75.25 years) underwent 18 TTSS for relief of obstruction. Thirteen patients were of American Society of Anesthesia (ASA) class 3 and four were of class 2. The locations of the obstructions were the antral-pyloric region (9 patients), duodenum (6), and oesophago-jejunostomy anastomosis (2). The pathology of these obstructions is summarised in the Table. Seventeen (94%) stents were successfully deployed. One stent failed to be successfully deployed via the endoscope, one patient required another stent because of migration of the first stent, and one patient required subsequent endoscopy to stop bleeding from the tumour. Endoscopic stenting relieved obstructive symptoms for 14 (82%) patients. The median dysphagia score improved from 4 to 2 after the procedure (P=0.001, Wilcoxon signed rank test). The median overall survival time after stenting was 6 weeks (IQR, 3-9 weeks). The median hospital-free survival time was 4 weeks (IQR, 1-7 weeks).

Discussion

Most patients who have inoperable tumours causing gastric outlet obstructions are too fragile to undergo surgical treatments. Surgical by-pass in the form of gastrojejunostomy carries significant morbidity and mortality.[1] Laparoscopic gastrojejunostomy has been described as a successful alternative minimally invasive means to treat gastric outlet obstructions.[6,7] Nevertheless, the requirement of general anaesthesia and prolonged operating time for such procedures are not desirable for patients with terminal malignancy. In contrast, endoscopic stenting can be accomplished using conscious sedation for all the patients in the study described in this report. Previous stents were mainly designed for

Table. Summary of pathology

Site of obstruction	Pathology	Patients No. (%)
Antral-pyloric region	Carcinoma of stomach	6 (35.3)
	Extrinsic compression by metastatic lymph node(s)	3 (17.6)
Duodenum	Carcinoma of pancreas	3 (17.6)
	Cholangiocarcinoma	1 (5.9)
	Extrinsic compression by metastatic lymph node(s)	2 (11.8)
Oesophago-jejunum	Recurrent carcinoma of stomach	2 (11.8)

oesophageal or biliary obstructions, and thus were limited by the delivery system or diameter of the stents when used for gastric outlet obstruction. The newly available self-expanding Enteral Wallstent has a slim delivery system, which allows deployment through the operating channel of an endoscope and a larger luminal diameter after delivery is ideal for gastric outlet obstruction. The looping of the delivery system in the dilated stomach can be solved by straightening the endoscope, which allows smooth deployment of the stent. In this series, only one stent failed to be deployed when using this design and technique.

Most patients have a short life expectancy after palliative stenting due to the underlying malignancy. The median overall survival time for these patients was only 6 weeks, which was short compared with other series.[5,8] This was probably related to the patient selection as this group of patients with terminal illness were otherwise unfit for surgery. Despite the short survival time, the obstructive symptoms were successfully palliated for more than 80% of patients, the quality of dietary intake improved, and they were able to be discharged from hospital. Kim et al[9] recently reported significant improvement of quality of life for 29 patients after palliative stenting. There is, however, insufficient data for quality of life assessment after palliative surgical by-pass in the literature for comparison. Further prospective studies could assess the quality of life after different treatments.

Cost is another important consideration, especially when health resources are limited. Yim et al[8] recently reported from a case-controlled study that endoscopic enteral stenting was more cost-effective than surgical gastrojejunostomy due to lower direct costs and shorter hospital stay.

Conclusions

Through-the-scope stent is safe and feasible. The procedure offers an alternative minimally invasive method for palliation of obstructive symptoms for patients with inoperable tumours causing gastric outlet obstruction.

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