Biliary metal stents for proximal esophageal or hypopharyngeal strictures

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Abstract

Introduction Endoscopic dilation is the standard of care for stenoses of the cervical esophagus, but refractory strictures require some form of stenting. Most endoscopists avoid the placement of metal stents near the upper esophageal sphincter as they can cause major problems like severe cervical pain and globus sensation. We report our results with the use of biliary SEMS in the upper esophagus, which have a smaller diameter than regular esophageal stents and therefore exert less expansive force.

Material and methods We retrospectively reviewed all patients in our center between July 2011 and June 2014 who received a biliary metal stent because of a refractory stricture in the cervical esophagus. We implanted biliary SEMS (Wallflex, Boston Scientific) with a diameter of 1 cm and length of 6–8 cm. Technical and clinical success, adverse events and duration of stenting were evaluated.

Results Ten patients were treated with biliary SEMS in the upper esophagus. Strictures were located between 10 and 19 cm from incisor teeth. Stent placement was successful in all (10/10) patients. One stent had to be extracted because of pain and globus sensation. Apart from that stent tolerability was good. All remaining patients (9/9) reported improvement of dysphagia with a decrease in mean dysphagia score from 3.2 to 1.78. Mean duration of stenting was 68 days.

Discussion Because of a high clinical success rate and good tolerability, biliary metal stents are a reasonable alternative for difficult strictures in the cervical esophagus, especially in the palliative setting.

Keywords Esophageal stenosis · Stent · Esophageal cancer

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The cervical esophagus, which ranges from 15 to 19 cm from the incisors [1], has traditionally been regarded a difficult place for endoscopic interventions. The treatment of strictures in this area is challenging. Endoscopic dilation is the standard of care, but therapeutic options for refractory strictures are rare. Refractory strictures are often caused by proximal esophageal tumors or occur as a sequel of surgical or radiation therapy [2]. These patients are often pre-treated, which makes operative re-intervention or recurrent radiotherapy difficult. Placement of self-expandable metal stents (SEMS) is well established for the treatment of malignant strictures in the distal or middle esophagus, but SEMS can cause major problems when used in the cervical region [3, 6, 9]. Metal stents placed near the upper esophageal sphincter often lead to severe cervical pain or globus sensation [3–6, 9]. Rates of post-interventional pain are increased in high strictures and with larger stent diameters [3]. Because of this, most endoscopists tend to avoid the use of metal stents in that region. This traditional view has begun to change as some authors published good functional results after stenting close to the upper esophageal sphincter [5–10]. Different types of stents were used. The stent diameter in these reports ranges from 18 to 23 mm, but tolerability remains a problem [5]. To minimize stent-associated symptoms, we used biliary metal stents, which have a diameter of

10 mm, for difficult cervical strictures. Stents with smaller size exert less expansive force on the sensitive cricopharyngeal region and could improve tolerability in the upper esophagus. We report our results in ten patients after the placement of biliary metal stents for proximal strictures.

Methods

We performed a retrospective evaluation of patients who were treated with a biliary metal stent for a proximal esophageal stricture (defined as upper margin less than 20 cm from the incisors) in a tertiary care hospital in Germany. The patients, who were treated between March 2011 and June 2014, were identified through the hospital database. Only patients with refractory stenoses after multiple dilatations underwent stenting, and all patients were informed about off-label use of biliary stents. The hospital records were reviewed retrospectively, and we evaluated technical success, clinical success, indication, position of the stricture, type of stent used, duration of stenting and complications. Dysphagia before and after intervention was graded as follows: 0 = ability to eat a normal diet, 1 = ability to eat some solid food, 2 = ability to eat some semisolids only, 3 = ability to swallow liquids only and 4 = complete dysphagia. Mean dysphagia scores were calculated.

Stent placement

Stenting was performed with biliary metal stents (Wallflex biliary, Boston Scientific, Natick, Mass) with a diameter of 10 mm and length of 60 or 80 mm. In malignant stenoses, we used covered or partially covered stents, and in benign stenoses, only fully covered stents were used. All patients were consciously sedated with midazolam and propofol. First, a guidewire was positioned through the stricture under fluoroscopic control. Stents were placed over the guidewire through the scope under endoscopic visualization, which allows optimal placement of the upper stent flare close to the upper margin of the stricture. Fluoroscopic guidance was used to ensure complete coverage of the stenosis (Fig. 1).

Statistics

Descriptive statistics as absolute numbers and percentages, medians and means with minimums and maximums were used to summarize the findings. The study was conducted in accordance with the Declaration of Helsinki and approved by our local ethical committee.

Fig. 1 Biliary metal stent to cover a stricture about 13 cm from the incisors in a patient with a proximal esophageal carcinoma

Results

We identified ten patients with proximal stenoses who had received a biliary metal stent. Mean patient age was 65 (51–73) years. The upper stricture margin was located between 10 and 19 cm from the incisors (Table 1). Eight patients had malignant strictures all caused by inoperable esophageal squamous cell carcinoma (SCC). Five of these eight SCC's were secondary after prior radiation therapy. The two benign stenoses also occurred after radiation therapy. The mean ECOG score in our patients was 2.

Stent placement was possible in all ten patients (technical success 100 %). One stent had to be extracted on the following day because of intolerable pain and foreign body sensation, and this occurred in the most proximal stricture (about 10 cm from the incisors). Apart from that no serious complications occurred. Two patients complained of mild post-interventional pain which was successfully treated with analgesics. Clinical success (defined as improvement in dysphagia score) was achieved in all of the remaining nine patients (100 %). Mean dysphagia score was improved from 3.22 to 1.78. Despite the small stent diameter, four patients with good performance status were able to eat some solid food.

Stents were covered in seven patients and partially covered in three. One stent was electively changed in a benign stricture. In malignant strictures, stents were left in place as long as clinically successful. Mean duration of stenting was 68 (1–225) days. We had two stent dislocations of a partially

Table 1 Patient characteristics

Nr.	Age	Etiology	Predisposing conditions	Dysphagia before stent	Dysphagia after stent	Stent size	Stricture position (cm from incisors)	Stenting duration (days)	Follow-up
1	59	SCC	Laryngectomy and radiation for laryngeal cancer 11 years before	3	1	10 × 80	18	74	Change because of stent dislocation
2	57	SCC	Simultaneous pharyngeal cancer	3	1	10 × 80	17	62	Died
3	73	SCC	Radiation therapy of the upper esophagus	4	3	10 × 80	19	33	Died
4	70	Postoperative/ irradiation	Jejunal interposition after pharyngectomy + radiation 12 years before	3	n/a	10 × 80	10	1	Stent extraction because of intolerable symptoms
5	51	Postoperative/ irradiation	Laryngo-pharyngectomy + radiation 3 years before	3	1	10 × 60	16	66	Elective change
6	59	SCC	Partial laser-laryngectomy + radiation for laryngeal cancer 2 years before	4	3	10 × 80	19	45	Last contact 45 days after insertion, stent in situ
7	70	SCC	None	3	2	10 × 80	16	225	Last contact 225 days after insertion, stent in situ
8	71	SCC	Thyroidectomy + radiation for thyroid cancer 24 years before	4	2	10 × 80	13	61	Change because of tumor ingrowth
9	71	SCC	Radiochemotherapy for tongue carcinoma 7 years before	3	2	10 × 80	16	44	Last contact 44 days after insertion, stent in situ,
10	69	SCC	Laryngectomy for hypopharyngeal carcinoma 17 years before	2	1	10 × 60	15	69	Change because of stent dislocation

covered and a fully covered stent after 74 and 68 days and one dysfunction because of tumor ingrowth into a covered stent after 61 days. All three patients were successfully treated with a new stent, and the other six stents remained functional until death or loss of follow-up.

Discussion

In our series, we report the successful use of metal stents in stenoses located in the area of the upper esophageal sphincter. Refractory strictures in this area are usually associated with surgery, radiation therapy or proximal esophageal tumors, and often a combination of these [2]. These patients frequently present with reduced performance status and multiple medical and social problems. In the palliative situation, disease prognosis is dismal, so effective palliation of dysphagia, which usually is the most disabling symptom, is needed [1]. The patients in our series are a typical example: Stricture etiology was mostly combined neoplastic and post-irradiation; especially, secondary squamous cell carcinomas were frequent. The median ECOG score of 2 indicates advanced disease with a limited prognosis. The high dysphagia score of 3.22 is close to the values other studies have measured in this patient group [5, 6, 8]. Relief of dysphagia was effective but limited with a remaining mean dysphagia score of 1.78, but all patients were able to swallow liquids and saliva post-intervention. This result is only slightly inferior to some groups using larger stents [5, 6]. Other groups report comparable results [1], maybe reflecting the fact that general condition plays a more important role than stent diameter. Four of our patients with good performance status were able to resume oral feeding with minimal dysphagia.

In patients with limited life expectancy reduction in peri-interventional morbidity, side effects and hospital stay are major issues. Stenting in the cervical esophagus is challenging: Major complication rates of up to 20 % have been reported [6]. Pain and foreign body sensation can be a problem and vary widely from 8 up to 45 % of patients [5, 6]. Optimal stent positioning is difficult because of the low distance to sensitive regions like the larynx. Biliary metal stents are deployed through the scope, which enables optimal visualization (Fig. 2). Our approach with combined endoscopic and fluoroscopic view allowed proper stent positioning in 100 % without any dislocation during the placement procedure. In contrast to other stent systems, dilatation before stent delivery was not necessary. Stent design might be another important factor to improve tolerability. Different types of stents have been used in the cervical esophagus, with diameters from 18 to 23 mm, but with the tendency to use stents with lower (18 mm) diameter [6]. The most widely used stent, which seems to achieve superior results [3, 7] is the Ultraflex stent (Boston Scientific) [1, 5, 6, 8]. It has the advantage of low rigidity, smooth edges and relatively weak radial expansion force [1, 3]. The "Wallflex biliary" stent we used is more rigid but has a smaller diameter and comparable expansion force. In our series, relief of dysphagia was provided with minimal side effects, and only one patient with the most proximal stricture had intolerable foreign body sensation. Mild post-interventional pain occurred, but was easy to treat. Apart from the relatively small stent diameter this might be influenced by the high rate of post-irradiation strictures in our series, which is a possible explanation for
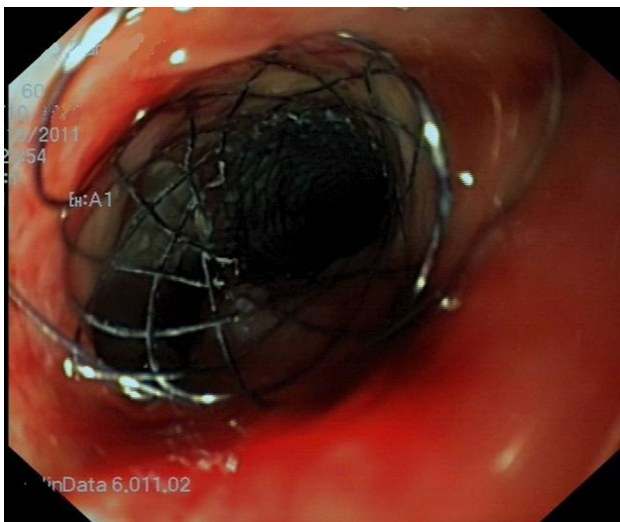
reduced sensibility in this area. No major complications like aspiration, bleeding or fistulas occurred, which compares favorably to other series [6]. Although our stent diameter was relatively small, we observed only slightly increased rates of long-term complications like stent migration and tumor ingrowth [1, 5, 6, 8]. The mean stenting duration of 68 days reflects stent failures, but also the morbidity of our patient population. This relatively short follow-up time limits the assessment of long-term success in our study. On the other hand, the time until long-term stent failure was at least 61 days, and both stent migration and tumor ingrowth were successfully solved with re-stenting. In conclusion, our results demonstrate that biliary SEMS provide fast symptom relief with minimal morbidity when used in the cervical esophagus. They are a reasonable alternative for difficult-to-treat strictures, where the use of regular esophageal stents seems impossible, especially in the palliative setting.

Fig. 2 Endoscopic view of a metal stent placed in the upper esophageal sphincter

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