How-to-do-it

Esophageal reconstruction with intraoperative dilatation of the hypopharynx for the management of chronic corrosive esophageal strictures.

A technical tip

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Abstract

Chronic corrosive strictures of the upper cervical esophagus and hypopharynx resulting from ingestion of caustic substances are a challenging surgical entity when repeated endoscopic dilatations fail to yield satisfactory results. Restoring the continuity of the upper digestive tract by esophageal substitution at healthy tissue margins not only compromises the integrity of the swallowing mechanism, but also often requires the performance of a tracheostomy in order to ensure avoidance of recurrent aspirations. We describe three cases of corrosive upper cervical esophageal strictures treated with intraoperative dilatation of the proximal hypopharyngeal stump and concurrent 'stenting' of the pharyngeal anastomosis with the conduit replacing the esophagus. All patients tolerated the procedure well. Avoidance of both impairment of deglutition and respiratory complications, as well as restoration of normal esophageal function, was successfully accomplished.

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1. Introduction

Esophageal substitution is often mandatory for patients suffering from esophageal strictures unresponsive to endoscopic dilatations and concomitant persistent dysphagia, as a result of corrosive injuries of the esophagus [1,2]. Strictures of the hypopharynx and upper cervical esophagus are particularly challenging, since the anastomoses at this level are susceptible to anastomotic leakage, early postoperative stenosis, and disarrangement of the deglutition mechanism resulting in recurrent aspirations [2—4]. Revision of the anastomosis (occurring in 7.1% [3]—12% [4]) and construction of a permanent feeding gastrostomy or jejunostomy (4% [4]) are additional grave complications.

We describe a technique for establishing such a high level anastomosis by intraoperative dilatation and concurrent 'stenting' of the pharyngoesophageal junction.

2. Patients/Results

Between 1998 and 2004, three male patients aged 17, 60 and 74 years with severe dysphagia due to chronic, diffuse, cervical esophageal strictures unresponsive to endoscopic dilatations following caustic injuries from ingestion of lye were admitted to our department.

Barium esophagography revealed almost complete obliteration of the cervical esophagus below the level of pharyngoesophageal junction in two patients, and stricture of the lower hypopharynx in the third case. All patients underwent preoperative laryngoscopic evaluation for exclusion of severe hypopharyngeal deformities, and colonoscopy for assessment of the colon as a potential conduit. Endoscopic evaluation of the stomach was not possible.

None of the patients had received surgical treatment during the acute phase of injury. The time interval between injury and reconstruction was 4, 7, and 8 months. All patients underwent transhiatal esophagectomy without thoracotomy. An isoperistaltic gastric conduit placed retrosternally was used for esophageal substitution.

3. Technique

During the cervical stage of the procedure, the cervical esophagus is encircled and mobilized according to the classic operative principles [5]. Division of the cervical esophagus is performed just below the level of the cricopharyngeal muscle. The use of a fine probe facilitates identification of the hypopharyngeal lumen, which is usually obscured by
thickened, stiff surrounding tissues (Fig. 1a). Following identification of the lumen, the smallest calibre of Bakes bile duct dilators (1 mm) is applied in cephalad direction, in order to enlarge the diameter of the obliterated proximal lumen (Fig. 1b). Gentle manoeuvring is mandatory during this stage to avoid false passage through the esophageal layers and/or perforation of the esophageal wall. By progressive dilatation with dilators of larger diameter (Fig. 1c), a final lumen of 10 mm width is achieved enabling the performance of a safe end-to-side anastomosis with the graft replacing the esophagus (Fig. 1d).

After construction of the posterior anastomotic layer by the use of interrupted sutures, a 30 F nasogastric tube of similar diameter with the newly restored lumen is placed through the anastomotic stumps as a stent. Closure of the anterior anastomotic side is performed in two layers. In order to retain the patency of the dilated lumen, the nasogastric tube remains in place for 4—6 weeks. Sessions of endoscopic dilatation start within 7 days after the tube removal.

No anastomotic leakage was observed in our patients and only one case of transient recurrent laryngeal nerve palsy occurred. Following removal of the nasogastric tube and evaluation of the anastomotic integrity by thin contrast swallow examination, oral diet with soft solids and liquids was initiated. All patients received sessions of endoscopic dilatation every week for 8—12 weeks for maintenance of the lumen patency. Normal deglutition and improved weight gain was achieved in all patients. Postoperative follow-up endoscopy at 8, 5, and 2 years revealed no stricture recurrence at the site of anastomosis.

4. Comment

This procedure has the advantage of preserving the integrity of the hypopharynx, minimizing the potential disarrangement of the swallowing mechanism after a high anchored anastomosis between the hypopharynx and the esophageal substitute. Esophageal reconstruction in the form of a pharyngo-enteral or pharyngo-gastric anastomosis is an option for corrosive strictures not amenable to dilatation [2], but major complication rates ranging from 16% [4] to 25% [6] have been reported. In addition, 12% of the cases may require permanent tracheostomy [4].

Postoperative stricture of the hypopharyngeal anastomosis is not an uncommon complication in the setting of corrosive strictures of the esophagus [2]. Retaining the intraoperatively placed nasogastric tube as a stent for 4—6 weeks, contributes to the maintenance of an adequate esophageal lumen by counterbalancing the forces applied by collagen deposition and scar retraction during the healing process at the anastomotic site [7]. Furthermore, safe and easily performed endoscopic dilatation is facilitated following its removal.

A potential disadvantage of this technique is the possibility of creating a false passage between the esophageal layers during the initial attempts of dilatation, especially when the lumen of esophagus is not clearly visible. However, according to our experience there is always a detectable lumen allowing the passage of a thin probe towards the pharynx.

By our approach, early and safe endoscopic treatment postoperatively is feasible. In addition, the functional and anatomic integrity of the swallowing mechanism are preserved. Consequently, the need for reoperation and permanent tracheostomy in these patients is decreased. Further confirmation of these positive results from application of our
technique in larger scale studies could hold implications for the reduction of complication rates following upper cervical esophagectomies.

References


