Surgical Management of Benign Coloesophageal Stricture: a Novel Technique

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Abstract Benign coloesophageal anastomotic stricture in postoperative colon bypass patients suffering from the corrosive stricture of the upper esophagus is a challenging problem. Failure of repeated endoscopic balloon dilatation makes way for revisional operative techniques like free jejunal grafts or interposition skin tube based on radial vessels. The situation arising from the morbidity of such reconstructive procedures, at times, becomes more complex than the stricture itself [1]. This clinical scenario has compelled us to innovate with a much simpler technique using buccal mucosal graft (BMG) to manage these strictures. Currently, the utility of BMG is mostly limited to urethral reconstruction. Overtime, it has become an ideal urethral substitute. Here, we present a case series of five patients who have been subjected to coloesophagoplasty with BMG and have demonstrated excellent results. With a median follow-up of 13 months, all patients have fully recovered and are taking solid and liquid foods satisfactorily. Thus, the option of coloesophagoplasty with BMG should always be kept in consideration while planning a revision surgery for a small-segment benign coloesophageal anastomotic stricture in the corrosive injury of the esophagus, considering the ease and excellent outcome.

Keywords Coloesophagoplasty · Anastomotic stricture · Buccal mucosal graft · Corrosive stricture

Indication

Long-segment corrosive stricture of the esophagus is the commonest indication for colon bypass surgery in Eastern India. Benign coloesophageal anastomotic stricture is an important complication for these patients. Repeated endoscopic dilatation of anastomotic stricture is usually the first step to manage this complication. In spite of repeated dilatations, a significant percentage of patients suffer from dysphagia. Surgical management by stricturoplasty frequently fails, and about 10–20 % of patients have to undergo complex revisional operative techniques by free jejunal grafts or interposition skin tube based on radial vessels [1]. We describe here a simple new surgical technique by using buccal mucosal graft (BMG) to manage this benign anastomotic stricture.

Material and Methods

Twenty-one patients suffering from a long-segment corrosive stricture of the esophagus were managed by colon bypass surgery from April 2010 to September 2013. Patients were between 18 and 45 years of age, and 18 were female (85.7 %). The patients were suffering for a maximum period of 5 years to a minimum of 3 months. Eight patients (38 %) were unable to swallow their saliva due to proximal esophageal and/or pharyngeal inlet obstruction. These patients were operated in stages, initially by esophagostomy or pharyngostomy, followed by different methods of dilatation of the upper gastrointestinal tract. Then, they were trained for swallowing solids and liquids for 3–6 weeks. If swallowing was satisfactory, then patients were taken up for colon bypass surgery. Remaining patients were taken up for single stage colon bypass operation. Following surgery, patients started taking food orally satisfactorily after 5–7 days [2]. The commonest complication was minor anastomotic leakage in the neck detected clinically or

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by methylene blue swallow [3] which healed conservatively over a period of 10 to 20 weeks postoperatively (mean 14 weeks). Five patients (23.8 %) started having difficulty in swallowing food, initially to solid and finally to liquids. All of them were operated in two stages and had developed local fibrotic sequelae due to ingestion of corrosive agent. They were subsequently diagnosed to have an anastomotic stricture in the neck by barium swallow. They were subjected to repeated endoscopic balloon dilatation. The patients improved initially, but the extent and duration of improvement following each dilatation gradually reduced.

These five patients were ultimately subjected to BMG repair of coloesophageal stricture as the management by dilatation alone failed. They were operated 3–7 months postoperatively. Under general anesthesia, the neck of the patients was exposed in the left side and fibrotic scar with stricture was dissected out. An incision started longitudinally from the adjoining distal healthy colon close to the anastomotic stricture and proceeded proximally along the scar. The incision extended proximally up to the stricture which opened up completely. Large Hegar's dilators were passed through that opening proximally into the oral cavity. The anesthetist observed the smooth passage of dilators in oral cavity with the help of a laryngoscope. Simultaneously, another surgeon harvested free BMG from the oral cavity [4]. After infiltrating underneath the buccal mucosa with 0.5 % bupivacaine with epinephrine, the buccal mucosa was incised and the buccinator muscle was dissected off. The graft was 1.5 to 2 cm in width and 2–3 cm in length in almost all cases and was adequate to cover the length of stricture. The mucosal aspect was placed to the luminal side, and the graft was sutured to the margin of opening with interrupted 3-0 polyglcolic acid suture (Fig. 1). The skin and soft tissue superficial to it were re-sutured. The patient was advised not to swallow saliva for 5 days. Liquid was started orally from the 5th day and semisolid from the 7th day. Low-residue solids started from the 10th day. Neck stitches were removed after 7–10 days.

Results

All the patients undergoing BMG repair had minor leak in the neck. Patients were instructed to press the leak site in the neck with the thumb and swallow the food at regular intervals. With this maneuver, these minor leaks healed spontaneously over a period of 3–10 weeks. After a mean follow-up of 13 months (maximum follow-up, 19 months), all the five patients are taking both solid and liquid foods without any difficulty. Postoperative barium swallow X-ray demonstrated an absence of anastomotic stricture in all cases (Fig. 2).

Fig. 1 Buccal mucosal graft in the stricture site

Discussion

In the corrosive injury of the esophagus, the mucous membrane is damaged and heals by fibrosis. The coloesophageal anastomosis in most of these patients actually is a colonic mucosa to fibrous tissue anastomosis which over a period of time contracts and leads to anastomotic stricture. Repeated dilatation mechanically stretches the opening and stimulates fibrosis. The presence and degree of mucosal impairment may be a useful predictor for anastomotic stricture. The reasons for the

Fig. 2 Postoperative barium swallow 4 months after surgery

development of anastomotic stricture are fibrosis following healing of cervical fistula, local ischemic events, and local fibrotic sequelae due to ingestion of a corrosive agent [3]. The incidence of anastomotic stricture in our series is lower (23.8 %) compared to stricture following caustic injury (33.3 %) [5].

Current literature suggests that reconstructive operative techniques like free jejunal grafts or interposition skin tube based on radial vessels are mostly used for revisional surgery, but these complex reconstructive procedures are prone to complications and the situation arising from such morbidity, at times, becomes more complex than the stricture itself. The steep learning curve and the expensive setup required are additional areas of concern in a country like India.

Such pertinent issues have prompted us to the use of BMG for coloesophagoplasty. BMG was first described for urethral reconstruction by Humby in 1941. Over-time, it has become an ideal urethral substitute because of early in-growth and graft survival, ease of harvest, surgical handling characteristics, hairlessness, and compatibility in a wet environment. We have not found any mention of BMG in coloesophagoplasty in surgical literature though the buccal mucosa and esophagus belong to the same alimentary system. Here, all our five patients who were subjected to coloesophagoplasty with BMG have demonstrated excellent results and are taking solid and liquid foods satisfactorily.

Conclusion

Our early results suggest that this innovative technique of coloesophagoplasty with BMG for a small-segment benign coloesophageal anastomotic stricture in the corrosive injury of the esophagus has resulted in satisfactory solution to this complex problem, and considering the ease and excellent outcome, this technique should always be kept in consideration while planning a revision surgery.

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