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CASE REPORT

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Buccal mucosal graft for recurrent cervical oesophagogastric anastomotic stricture: A case report

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ABSTRACT

Background: Corrosive oesophageal strictures are a common clinical challenge in children, particularly in developing countries where the domestic production of soap is prevalent and often involves caustic agents. Surgical options for managing complications from corrosive ingestion include gastric pull-up, colonic interposition, and jejunal substitution.

Case Presentation: An 11-year-old boy with complications of corrosive oesophageal injury presented with severe malnutrition. Following nutritional rehabilitation, he underwent a gastric pull-up procedure using the Orringer technique. Postoperatively, he developed an anastomotic stricture that was successfully managed with a buccal mucosal graft.

Conclusion: Buccal mucosal graft stricturoplasty represents a viable surgical option for managing recurrent anastomotic strictures following gastric pull-up procedures, particularly in settings with limited access to advanced endoscopic or surgical alternatives.

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Buccal mucosal graft; oesophageal stricture; anastomotic stricture; corrosive ingestion; paediatric oesophageal surgery.

Introduction

One of the most common causes of gastrointestinal strictures in children is the ingestion of corrosive substances, accounting for over 80% of all cases globally [1]. The majority of these ingestions are accidental and occur in children under the age of five, representing 60%–80% of paediatric cases [1,2]. Despite public health interventions, such as safety training, warning labels, and childproof packaging, these incidents remain prevalent—especially in developing countries [2]. In Nigeria, household soap production is a common practice, often involving soda lime crystals or reconstituted caustic liquids. These agents pose a significant risk to children and have been implicated in many corrosive injuries [3].

The oesophagus is the most affected organ, with complications ranging from early mucosal ulceration and perforation to late-stage strictures, gastric outlet obstruction, laryngeal stenosis, and even malignancy [1]. Short segment strictures may be amenable to serial dilatation, but long segment strictures often require surgical intervention using visceral conduits such as the stomach, colon, or jejunum [4]. Gastric pull-up has advantages due to the robust blood supply of the conduit and the requirement for only one anastomosis, potentially lowering the risk of leaks [4,5]. Nonetheless, recurrent dysphagia from anastomotic re-stricture is a known complication. Contributing factors include ischaemia at the anastomosis, leaks, and suboptimal surgical technique [6]. Anastomotic strictures after gastric pull-up are reported in 12%–40% of cases. These are typically managed with serial dilatation using various dilators, with success rates reaching up to 88% in some series [6,7].

We report a case of recurrent cervical oesophagogastric anastomotic stricture managed using a buccal mucosal graft following a gastric pull-up procedure.

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Case Report

An 11-year-old boy presented with a long segment oesophageal stricture following the ingestion of soda lime crystals (Fig. 1). He was malnourished at presentation and underwent feeding jejunostomy for nutritional rehabilitation. After 4 months, he was optimized and scheduled for a gastric pull-up using the Orringer approach. Intraoperatively, extensive fibrosis of the proximal cervical oesophagus was noted.

Postoperatively, the patient developed cervical oesophagogastric anastomotic dehiscence by the fifth day. This was initially managed conservatively but ultimately required surgical revision. He also developed peritonitis from intraperitoneal spillage of the feeding jejunostomy and underwent re-exploration, peritoneal lavage, and revision of the feeding jejunostomy. Total parenteral nutrition was commenced, and he was eventually discharged home in stable condition.

Two months later, he presented with progressive dysphagia, initially to solids and then to semi-solids. Serial dilatations were attempted using Savary-Gilliard dilators over 12 weeks with temporary improvement, followed by recurrence. Due to limited resources and extensive abdominal adhesions, reoperation with colon or jejunal interposition was not feasible. He was scheduled for cervical exploration and stricturoplasty using a buccal mucosal graft.

The surgical procedure was performed by two coordinated teams: the cardiothoracic team and the urology team, the latter having routine experience in harvesting oral mucosa for substitution urethroplasty. The oral harvest team operated independently of the cervical team, utilizing separate surgical instruments to prevent cross-contamination.

The buccal mucosa was harvested from the right inner cheek following adequate exposure. Key anatomical landmarks, particularly the Stensen's duct near the second upper molar, were carefully identified and preserved. A Kilner-Doughty mouth retractor facilitated exposure, and stay sutures were placed to create adequate tension on the mucosa. The cheek mucosa was infiltrated with adrenaline (1:200,000 dilution) to elevate the tissue plane and minimize bleeding. An ovoid-shaped free graft was then harvested from below the duct's opening, defatted, and transferred to the cardiothoracic team.

An anterior cervical oesophagotomy was performed along the strictured segment, providing direct access and clear visualization of the

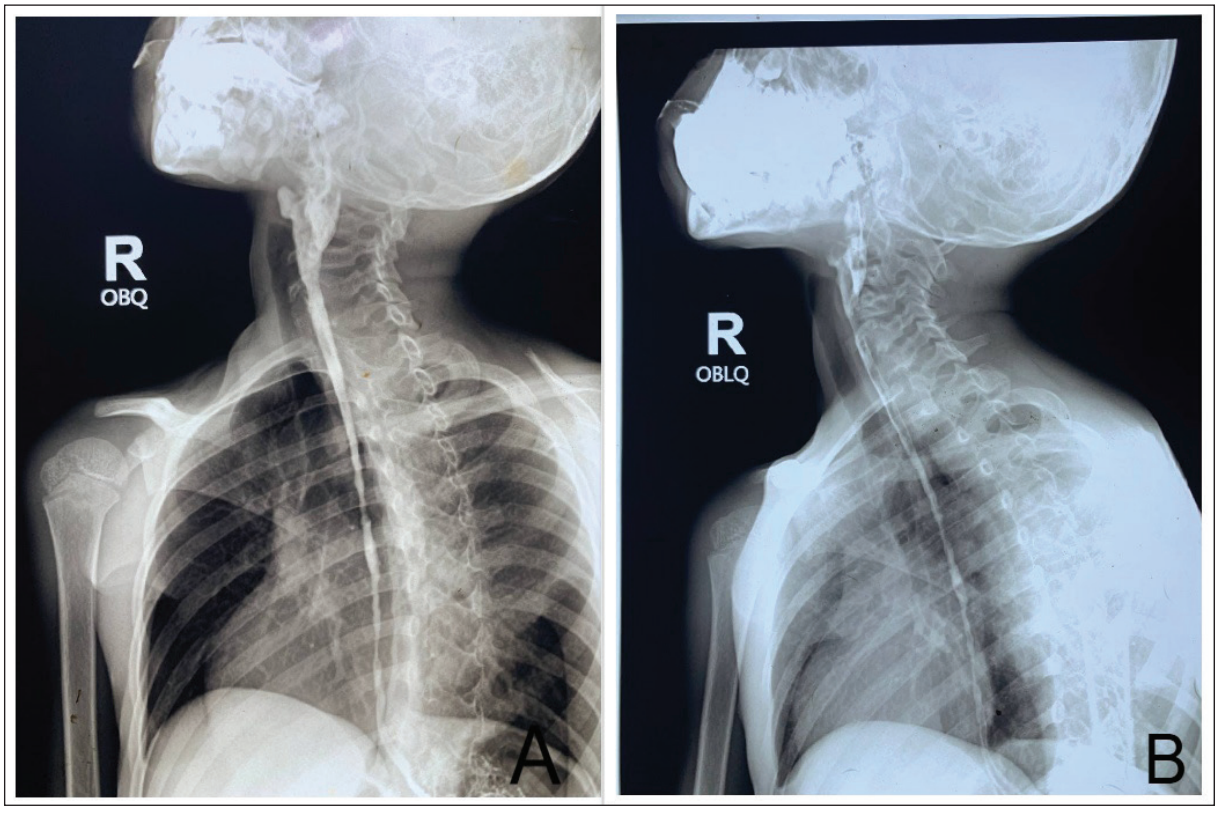

Figure 1. (A and B) Preoperative swallowing examination showing a long segment oesophageal stricture.

intraluminal dorsal aspect of the stricture. The dorsal component was incised longitudinally to relieve the narrowing. A free buccal mucosal graft, previously harvested and prepared, was then applied as a patch over the incised dorsal segment to augment the lumen. The anterior oesophageal incision was subsequently closed in layers over a nasogastric tube (Fig. 2).

The patient had an uneventful postoperative course and resumed oral feeding within 2 weeks. He has remained asymptomatic, with no recurrence of dysphagia, over a 5-year follow-up period.

Discussion

Anastomotic strictures are a common complication following oesophageal surgeries, particularly cervical oesophagogastrostomies, with reported incidences of 12%–40% [7]. While non-surgical methods like dilatation, stenting, and intralesional steroids remain first-line treatments, success rates vary from 40% to 90%, and recurrence is not uncommon [8,9]. Decisions regarding which procedure to perform first and how long to proceed between procedures pose a unique challenge, with no published data for guidance. This lack of consensus highlights the need for further research to establish standardized protocols that could minimize complications and improve patient outcomes. Hence, many surgeons have tried various procedures on these patients [9]. Our patient underwent repeated dilatation without lasting success. Endoscopic procedures and traditional interposition surgeries were either unavailable or not feasible due to prior surgical complications of extensive intraperitoneal adhesions encountered during the previous surgical exploration. These peculiar challenges necessitated a novel approach to treat the recurrent anastomotic stricture and relieve dysphagia.

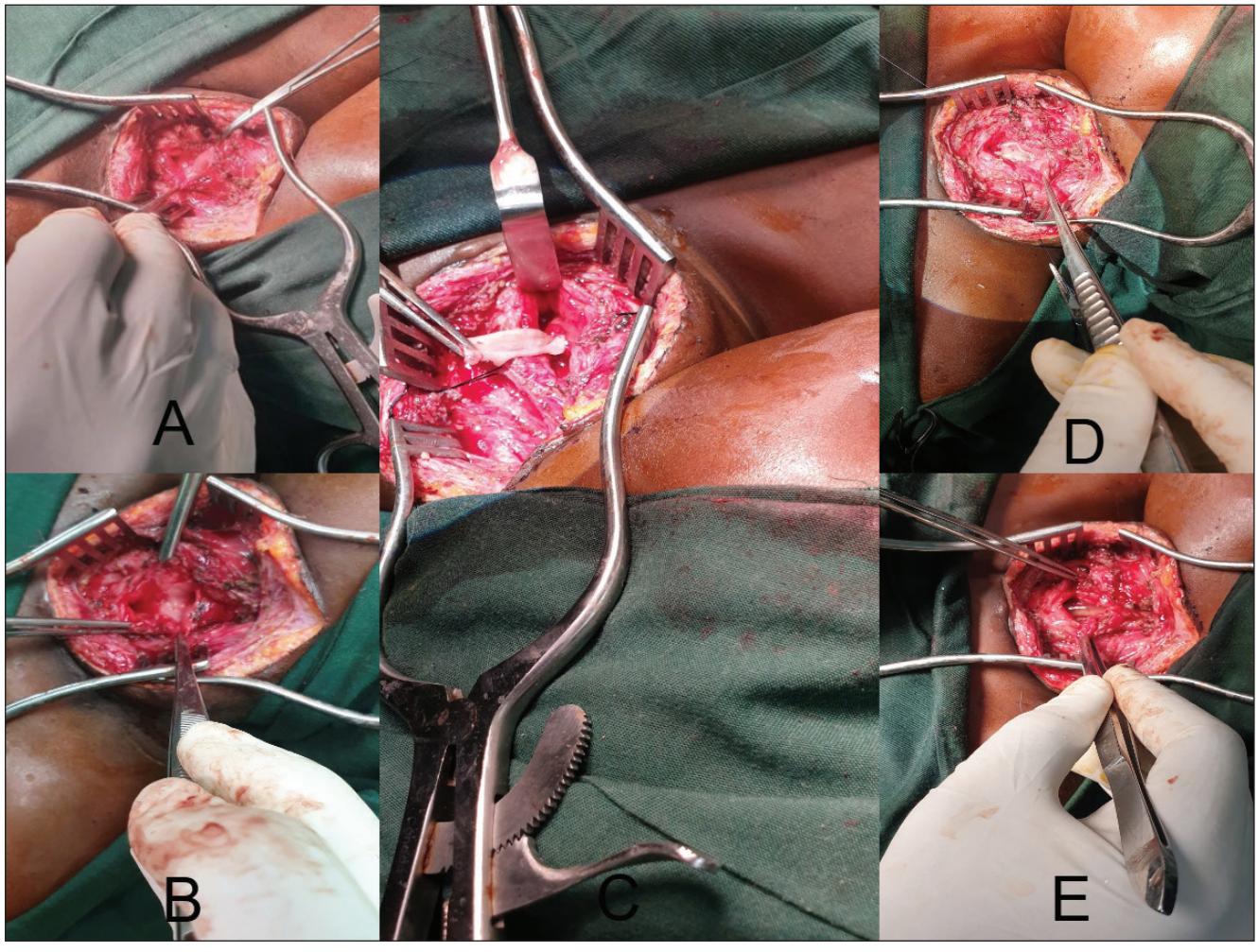

Figure 2. Intraoperative details. A: Exposure of the cervical oesophagus. B: Anterior oesophagotomy exposing the strictured oesophageal lumen. C: Buccal mucosal graft is about to the laid. D: Buccal mucosal graft sutured to the incised dorsal wall (dorsal on-lay). E: Closure of the oesophagus over a nasogastric tube.

The use of buccal mucosal graft (BMG) for reconstruction of urethral stricture is well documented. However, its application in the context of oesophageal reconstruction remains underexplored [10]. Therefore, we considered the potential of utilizing BMG as a solution to address the unique complications presented by the patient's condition, aiming to enhance healing and restore normal swallowing function. Hashem et al. [11] reported the use of BMG for cervical oesophagoplasty in mongrel dogs. They found that the procedure was well tolerated, the lumen of the patched area became covered with mucosa with slight scar retraction, the diameter of the lumen was not significantly decreased, and the BMG graft showed a histology that is similar to that of the native oesophagus [11]. Sasaki et al. [12] reported 3 cases of cervical oesophageal strictures managed using a cheek island flap, which is a composite of skin, buccinator muscle, and buccal mucosa based on the facial artery [12]. They reported excellent reports in terms of improvement in dysphagia and good postoperative contrast oesophagogram. The procedure, which requires ligation of Stensen's duct in some cases, can be associated with numbness of the lips and occasionally Frey's syndrome [12]. Chakrabarti et al. [13] described the use of BMG for repair of benign coloesophageal stricture in five patients with excellent results [13].

In this case, the graft was used to augment the stricture site, providing a mucosal surface compatible with the oesophagus. The procedure avoided the morbidity of additional abdominal surgery and has provided durable relief over 5 years of follow-up. The BMG is readily available, easy to harvest, and very similar to the native oesophageal mucosa, making it ideal for reconstruction in patients with limited options for reconstruction, like our reported case.

Conclusion

Buccal mucosal graft stricturoplasty is an effective and innovative option for managing recurrent oesophageal anastomotic strictures, especially in resource-limited settings where conventional surgical or endoscopic alternatives are not feasible, or in patients with limited options, like the patient reported.

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