

CASE REPORT

Colon interposition for Esophageal Replacement in Corrosive Stricture through Transhiatal Route – First time in Bangladesh

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Abstract:

Stomach is the most common conduit used after esophageal resection. However, stomach may not be feasible all the time to use as a conduit. In that setting, colon is an alternative conduit with several advantages. In this article, we are reporting a patient who had underwent multiple dilatation of esophagus for corrosive stricture esophagus but his symptoms of dysphagia did not subsided. Also patient's stomach could not be used as a conduit, as he had undergone gastro-jejunosotomy for gastric outlet obstruction. Hence colon was preferred in this case as a conduit after esophagectomy. Transhiatal approach for esophageal resection and colon interposition was performed in our case which was first ever documented procedure in Bangladesh, so we are reporting this case of colon interposition via transhiatal route.

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Introduction

Corrosive esophageal injuries of the esophagus are caused by the ingestion of strong acid or alkali. Ingestion of corrosive agents could be either accidental or suicidal. Accidental ingestions are mostly common in children and with acid since it is colorless as water. But suicidal ingestions are mostly common in adults and with alkali. Ingestion of acid produces coagulation necrosis limiting the depth of injury, whereas ingestion of alkali produces liquefaction necrosis and increased depth on injury¹. Transhiatal approach for esophageal resection is safe and sufficient and in times has many advantages². Other most commonly performed techniques for esophageal resection are one-stage, two-stage or three-stage esophagectomy and minimally invasive techniques. Each of the techniques has their own advantages and disadvantages.

Case report:

A 25 years old gentleman, Mr. Porimol Kumar Das, hailing from Bogra presented to Thoracic Surgery Unit, NIDCH with complaint of difficulty on swallowing for 3 years. His problem started after he had suicidal attempt with ingestion of acid 3 years back. Immediately after ingestion of acid, he had excessive salivation and bleeding orally with burning pain and painful swallowing for which he was managed primarily in SZMCHospital, Bogra. After two days of this incident, he was started on liquid diet orally and gradually solid food was being started. However he experienced difficulty on swallowing even for liquid food and was referred to our hospital, NIDCH for further management. After all pre-operative preparation, rigid esophagoscopy and esophageal dilatation was done (stricture was found at 17cm from upper incisor teeth and dilatation done up to 34Fr). After

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this procedure, he was apparently alright and he could take solid food. One month later, he developed cough and severe vomiting. Vomitus contained food particles which were taken several hours back. He was diagnosed with gastric outlet obstruction due to pyloric stenosis, which was corrected by Gastro-jejunostomy.

About 9 months of the initial dilatation, he again presented with difficulty on swallowing. This time he underwent rigid esophagoscopy and dilatation twice. During the second attempt of dilatation, esophageal perforation occurred and he was managed conservatively with tube thoracostomy. He gradually started on liquid and then solid diet, which he tolerated well.

In next one year, he had esophageal dilatation for two more times. Everytime after dilatation he could take food for few months and then he again developed difficulty on swallowing. Then he was admitted for surgical correction of the condition.

On physical examination, he was ill-looking, emaciated, with poor nutritional status. BMI was 14.02 (weight=41kg, height=1.71m). He was



Fig.-1: Long segment stricture esophageal.

moderately anemic, but cyanosis, icterus, clubbing, koilonychia, edema absent and accessible lymphnodes were not palpable. JVP not raised and thyroid gland not enlarged. His pulse was 80bpm regular, BP was 110/80mmHg, RR 18/min and he was afebrile. Abdominal examination

revealed that abdomen was scaphoid in shape, well healed upper midline scar was present and umbilicus was centrally placed. Abdomen was soft, no any mass was palpable and organomegaly was not found. Tympanic on percussion and normal bowel sound was heard on auscultation. Other systemic examination reveals normal findings.

Investigation revealed hemoglobin 11.2gm/dl (after three units of whole blood transfusion), ESR 27mm in 1sthr, TC 8600, neutrophils 60%, lymphocytes 30%, monocytes 06%, and eosinophil 04%, blood group "O" positive, Na 138mmol/L, K 3.5mmol/L, Cl 103mmol/L, RBS 100mg/dl, Urea 28mg/dl, S.Creatinine 1.0mg/dl, HBsAg/Anti-HCV-negative, sputum for AFB-negative and ECG and Echocardiography revealed normal study. Barium study showed persistent narrowing of almost whole length of the esophagus with passage of dye to stomach and then to jejunum bypassing the duodenum.

After all pre-operative preparation, patient underwent restoration of esophago-gastric continuity by colon interposition and feeding jejunostomy via transhiatal approach on 9th July, 2014. With all aseptic precaution, draping done. Abdomen opened with upper midline incision. Transverse colon and adjoining parts of ascending and descending colons were mobilized. Right, middle and left colon artery were identified. Transverse colon was chosen for the conduit and prepared after ligation and transaction of middle colic artery, keeping the ascending branch of left colic artery as the principle blood supply of the graft. Oblique incision was made on left side of the neck, then cervical esophagus was mobilized and healthy part of the esophagus for proximal anastomosis was identified. Transverse colon was freed after the resection proximal to the hepatic flexure, which was later anastomosed proximally with the cervical esophagus. The distal resection was done near the splenic flexure and anastomosed distally to the anterior part of the body of stomach. This pedicle colon graft was taken to the neck through the trans-hiatal route. The colonic continuity was restored by colo-colic anastomosis using circular GI stapler. Rest of the anastomosis was done by hand-sewn technique. Feeding jejunostomy was performed and abdomen was

closed in layers keeping one drain tube in situ and also the cervical incision was closed in layers keeping another drain tube in situ. On 7th POD, patient developed colo-colic anastomosis leakage, for which initially conservative management was tried but patient deteriorated with fecal matter spreading along the fascial plane of anterior abdominal wall giving rise hyperemia and patchy cutaneous gangrene. On 13th POD, re-exploration laparotomy was done and loop colostomy was performed. With debridement and daily dressing followed by skin grafting, the complication was managed well. On subsequent follow-up after 3 months, patient can swallow satisfactorily and his

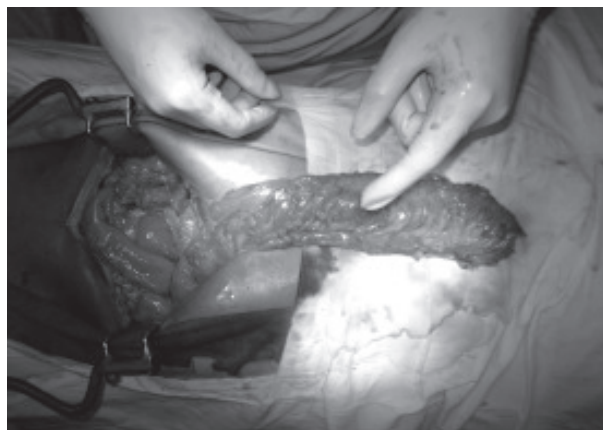


Fig.-2: Free colon graft.

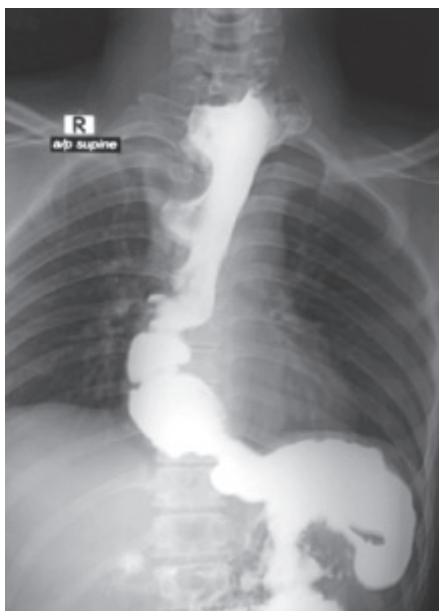


Fig.-3: Showing colon interposed in esophageal position.

all wounds were healthy and had functioning loop colostomy in situ. Barium study was satisfactory. His loop colostomy was closed after this follow-up and now he is passing stool normally.

Discussion:

Trans-hiatal approach for esophageal resection is indicated for benign esophageal disease for which complete lymphadenectomy may not be necessary and also in a patient with poor pulmonary function ($FEV_1 < 800\text{ml}$ or $< 35\%$ predicted) and pleural symphysis, which would favour technique that avoids thoracotomy³. Also the transhiatal route is the most anatomical and had shortest distance between the cricoesophagus and gastroesophageal junction. Complications like transient recurrent laryngeal nerve palsy, anastomotic leakage and stenosis occurred in acceptable number of patients showing that transhiatal route for esophageal resection is safe and satisfactory procedure for benign obstructive condition of the esophagus.² Our patient has a benign condition (corrosive esophageal stricture) that doesn't necessitate lymphadenectomy but his pulmonary reserve is up to the mark. Hence transhiatal approach was done.

Although the stomach is the most commonly used conduit for esophageal replacement after esophageal resection, colon has multiple advantages compared to stomach as a conduit. Resistance to acid, sufficient length of graft, consistent and robust blood supply, and potential for wide gastric resection margin for cancer of gastroesophageal junction are the main advantages. However, need of preoperative evaluation with colonoscopy, barium enema +/- colonic vessels angiography, pre-operative bowel preparation, more time consuming to mobilize and to do 3 anastomosis and increase late redundancy requiring re-operation are the disadvantages of colonic interposition compared to the gastric pull-up.⁵ Also colonic interposition is technically demanding and often used only in specialized centers. As our setting is also specialized center with potential surgeons and also the stomach had been used previously for gastro-jejunosomy, colon was primarily selected in our case.

Anastomotic leakage, graft necrosis and post-operative stricture are the known complication after the esophageal resection. In one study, graft

necrosis and or anastomosis leakage occurred in about 10% and stricture occurred in about 22% of the patient and also anastomotic leakage and stricture are more common and the strictures are more severe after gastric pull-up compared with colon interposition.² In our case, esophageal anastomosis had no leakage or stricture on follow-up but he developed the leakage from the colocolic anastomotic site leading to hyperemia and patchy necrosis of the anterior abdominal wall, which was managed by defunctioning loop colostomy and regular debridement and dressing of the necrosed part, and later the split-skin grafting. It was also seen that only the colocolic anastomosis was done by the circular GI anastomosis, whereas other two anastomosis (i.e. esophago-colonic and gastro-colic anastomosis) was done with the hand-sewn technique. It shows that our surgeons are professional in traditional hand-sewn techniques.

In conclusion, colon interposition after esophageal resection is suitable for young patient with benign condition requiring the esophageal replacement. The long-term result is good as the stomach has been preserved, hence the reservoir function is intact and also had less chance of aspiration. Therefore the quality of life is good as compared to gastric pull-up. This operation had been performed for the first time in our centre and had

uplifted the confidence for the surgeons but the long-term efficacy of this procedure is yet to be known by performing multiple number of cases.

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