# Colon Interposition for Esophagus and Pyloric Antrum Strictures Caused by Caustic Agent Ingestion

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ABSTRACT

Swallowing irritating agent can cause chemical burn, which can develop complications such as stricture. Correctional procedures may cause further tissue damage with additional loss of function. Colon interposition is a therapeutic option for severe stricture cases.

**Keywords:** Agent ingestion, chemical burn, colon interposition, stricture

ABSTRAK

Menelan agen iritatif mengandung bahan kimia seperti asam atau basa dapat menyebabkan luka bakar kimiawi, pada beberapa kasus menyebabkan komplikasi striktur ringan hingga berat. Beberapa prosedur koreksi esofagus dapat menyebabkan kerusakan jaringan lebih lanjut dengan kehilangan fungsi. Interposisi colon merupakan pilihan terapi kasus striktur berat. **Andry Irawan, Abdul Mughni Rozi. Interposisi Kolon untuk Terapi Striktur Esofagus dan Antrum Pilorus Akibat Cairan *Caustic***

**Kata kunci:** Agen iritatif, interposisi colon, luka bakar kimiawi, striktur

## BACKGROUND

Lye (linden/soap ingredient) is a general word for a strong base used as a cleaning agent; sodium and potassium can be found in the form hydroxide liquids, pastes and granules used in cleaning detergent. Acidic (sulfuric, hydrochloric) chemicals are often found in toilet cleaners.[2,3] Acid and base chemicals can cause chemical burns. Swallowing irritating ingredients can cause severe and progressive damage to the stomach and the esophagus. It is often accidentally occurs in children or in adults due to a suicide attempt. The degree of damage is influenced by the concentration, amount and duration of exposure.

Several procedures on oesophagus can cause further tissue damage with additional loss of function.[1] Repeated dilatation can be performed in chronic stricture, but it is ineffective and may cause complications in more severe strictures; in those cases, surgery should be performed.[1] Colon interposition is a therapeutic option in severe cases.[1,2]

## CASE

A 21 year-old male presented with dysphagia and epigastrium distention. About 1 month ago he drank toilet cleaner fluids, because of personal problems. He was treated in a district hospital for 1 week. There was difficulty in swallowing and drinking for 2 weeks accompanied by bloating, heartburn, but no nausea, vomiting, fever. He was taken to district hospital and then referred to ENT specialist. NGT installation, barium study, and endoscopic examination were all unsuccesful. The patient was referred to the Digestive Surgery.

On examination, blood pressure was 120/70 mmHg, pulse 88 x/min, respiratory rate 20 x/min, temperature 37,2 $^{0}$C. Abdominal distention was only in epigastric area. Laboratory findings were within normal limit. On barium swallow and esophagoscopy, we found narrowed esophagus at 16 – 25 cm from incisivus with minimal mucosa laceration, minimal redness and gastric juice. The conclusion was 1/3 proximal esophagus stricture.

Esophageal replacement using ascending colon was planned. After 3 days of bowel preparation, a laparotomy was done with right colica artery preservation and release of the ascending colon todd white line. The principle of this procedure is to make a channel pass through the oesophageal stricture and pyloric stricture sites by making 4 anastomoses: (1) ascending colon and oesophagus anastomosis; (2) gaster and colon transversal anastomosis; (3) ileum and colon transversal anastomosis; and (4) stomach and jejunal (side to side) anastomosis.

Thus the reconstruction is isoperistaltic (which means that the direction of intestinal peristaltic movement from proximal to the distal direction)– the segment of the graft from the ascending colon will be anastomosed with the cervical esophagus, and the 1/3 proximal transverse colon with the stomach.

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We also did ileocecectomy and performed 2 more anastomoses, between stomach and jejunal(side to side) and between ileum and colon transversal (end to end).

## POST–OPERATIVE MANAGEMENT

The patient was remained intubated and transferred to ICU. Ceftriaxone and metronidazol were added as the ICU team was concerned about contamination from hollow viscus. After extubation at 36 hours, the patient was transferred to the surgical ward. Post surgery was complicated with superficial infection of the entry wound on neck at the third hospital day, managed by local dressing and local antibiotic. The patient was discharged after 21 days wihout sign of peritonitis and leakage. Barium swallow before discharge showed the contrast passage within colon is streamlined. Skin incision infection is healing and swallowing function works well at 1 month follow – up.

## DISCUSSION

Esophageal stricture is a complication after swallowing caustic agent, often accompanied with pylorus stricture. Colon interposition is indicated. The absolute contraindications are intrinsic colonic disease such as inflammatory bowel disease or malignancy and inadequate arterial blood supply to the colon. Relative contraindications include portal hypertension, extensive diverticular disease, and multiple colonyc polyps.[5]

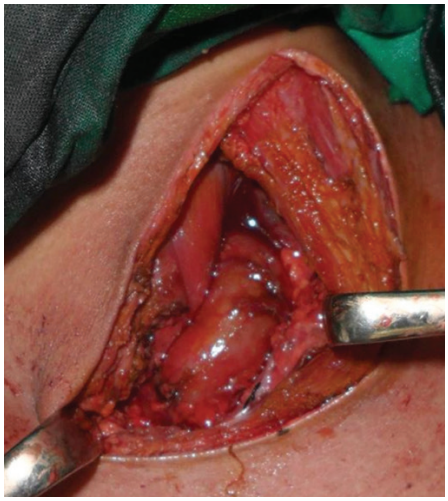

**Figure 1.** Ascending colon and oesophagus (end to side anastomosis)

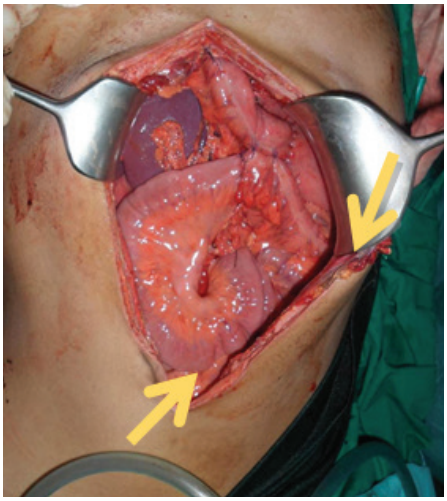

**Figure 2.** Gaster and colon transversal anastomosis (side to end) Ileum and colon transversal anastomosis (end to end)

**Figure 3.** Sternal tunneling

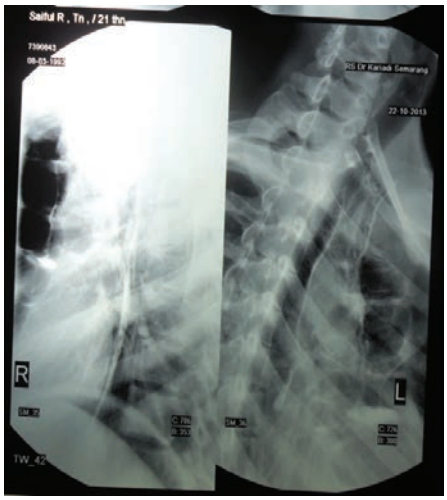

**Figure 4.** Barium swallow after operation showed contrast passage within colon

The use of colon as an esophageal substitute has been introduced almost a century ago.[1] Several modifications have been described, using the left, the right, or the transverse colon as an interposition graft.[1] Standard colon interposition grafting had a complication rate of 30% to 65% and a death rate of 0% to 23%.[6,7] Furst, *et al*, found no complications from insufficient blood supply or insufficient venous drainage; minor complications (pneumonia without respiratory insufficiency) occurred in three patients (20%). Major complications (27%) were anastomotic leakage, subcutaneous dehiscence of the abdominal wall, pulmonary embolism, and pneumonia, complicated by sepsis and respiratory insufficiency.[1] Li DX, *et al*, reported seven (44%) of 16 patients with colonic interpositions who underwent postoperative upper gastrointestinal tract radiographic examinations had nonanastomotic strictures of the interposed colon.[8]

Comparison between studies on left colon as an esophageal substitute is limited because of potentially confounding covariables, such as differences of surgery techniques, patients or the time period.[6-8]

## SUMMARY

Stricture of esophagus greatly disrupted the function and quality of daily life. Interposition of the left colon became the most popular procedure. Complication from this technique are graft ischemia, leakage, and strictures. The prognosis is good, complications can increase morbidity and mortality.

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