



## Case report

# Formation of the upper digestive tract by the ileum - right colon for patient with concurrent cancers of the esophagus and the stomach: A case report

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## ABSTRACT

**Introduction and importance:** A very rare case with presence of both esophageal and gastric cancers raised questions on how to perform optimal surgery for such cases. To date, reports on experimental surgery strategies for these rare cases remained sparse in the literatures.

**Case presentation:** A 61-year-old male patient having epigastric abdominal pain and swallowing difficulties for a month prior to the hospital. Esophagoscopy and gastroscopy results showed a 2-cm lesion in the esophagus, located around 25 cm away from the teeth arch; and a 2-cm ulcer lesion with high ridge line at the corner of the lesser curvature of stomach. Biopsy results revealed esophageal squamous epithelium carcinoma and poorly differentiated gastric adenocarcinoma. The surgery was esophago-gastrectomy with curettage of the lymph nodes and reconstruction of the upper gastrointestinal tract with the ileum - right colon in the left side of the neck.

**Clinical discussion:** We did not remain the stomach and performed thoracoscopic Ivor Lewis esophagectomy with chest anastomosis, as in previous studies to prevent cancer recurrence. Here, we performed a new surgical method of reconstruct the upper gastrointestinal tract by connecting the upper part of the esophagus at the neck, to the ileum - right colon.

**Conclusions:** This case could suggest an effective surgical strategy that the ileum - right colon was an organ to be used in replacing the upper gastrointestinal tract in cases of removing the entire stomach and thoracic esophagus, which could serve as a valuable reference for similar rare cases in the future.

## 1. Introduction

The concurrent malignancies of the esophagus and stomach are very rare but seems to be more common in recent years. However, the optimal management of simultaneous gastric and esophageal cancers has not been established yet. There have been a sparse number of publications on such cases being reported in literatures to date. Given tremendous variations of tumor location, size, stage, and so on, it has been a challenge for physicians to choose the most effective surgery methods, especially for the concurrence of esophageal squamous cell carcinoma and gastric adenocarcinoma that requires reconstruction of the upper gastrointestinal tract. Here, we reported a case of a patient with esophageal squamous epithelium carcinoma and gastric adenocarcinoma. To our best knowledge, this is the first case to introduce a novel surgical procedure using the ileum - right colon to reconstruct the upper gastrointestinal tract. The case report could serve as a valuable reference for similar rare cases in the future.

## 2. Case report

In May 2020, a 61-year-old male patient, previously healthy, without family history of any cancer, reported having epigastric abdominal pain and swallowing difficulties (choking) for a month before coming to the hospital. The patient had concurrently smoked around 10–12 cigarettes and consumed 400 mL on average of handmade alcohol daily for more than 30 years. The patient did not have signs of weight loss, blood vomiting, black stool, and bilateral Virchow or swollen lymph nodes at the neck. His esophagoscopy and gastroscopy results showed a 2-cm lesion in the esophagus, located around 25 cm away from the teeth arch; and 2-cm ulcer lesion with high ridge line at the corner of lesser curvature of stomach (Fig. 1A–B). Endoscopic ultrasound indicated a 2-cm flat lesion invading the submucosa with clear muscular layer (T1), and the angle of lesser curvature of stomach has a 2-cm flat ulcer lesion spreading to the muscles (T2) (Fig. 1C–D). Biopsy results revealed that there were esophageal squamous epithelium carcinoma and poorly

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differentiated gastric adenocarcinoma. Results from hematology and biochemistry testing, as well as lung function measuring were normal. A chest and abdomen computed tomography (CT) scan did not show any abnormal damage in the mediastinum and abdomen. Additionally, colonoscopy showed that the entire colon and the end of ileums were normal.

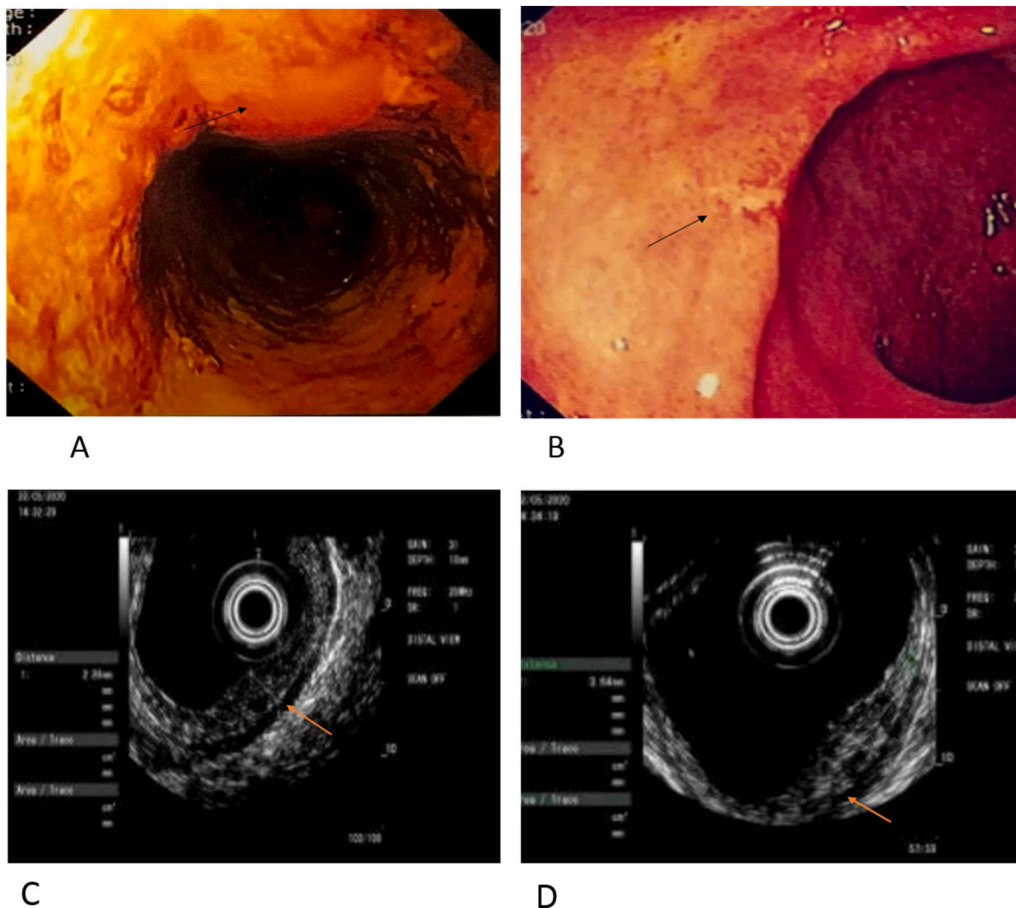
Before surgery the patient overall condition and his lesions were carefully examined, to warrant the diagnoses of T1NoMo esophageal squamous epithelium carcinoma and T2NoMo poorly differentiated gastric adenocarcinoma. Esophago-gastrectomy with curettage of the lymph nodes and reconstruction of the upper gastrointestinal tract with the ileum – right colon in the left neck, were performed.

Endotracheal anesthesia was induced so that the patient lied on his back, with high chest and head tilted to the right. The abdominal opening session was performed first to assess damages in gastrointestinal and anatomy of the ileum -right colon to decide the surgical method. The abdomen was opened at the middle white line on the navel and the surrounding organs showed no abnormalities. There was 2-cm non-invasive firm mass at the corner of the lesser curvature of the stomach. We sequentially resected the entire greater and lesser epiploon, constricted stomach blood vessels, performed lymphadenectomy of D1 and D2 groups and cutting the duodenum tip cut with a 75-mm straight stapler, and esophago-gastrectomy following the Orringer method [1]. The right colon was released, and we preserved all the nutrient vessels of right colic, ileo colic, and the middle colic, and also cut across the ileum at 8 cm from the ileum angle, appendix, placing the right ileum colon through the posterior mediastinum, to the neck. Finally, we connected the cervical esophagus to the ileum by a CDH Stapler 21 with end-side, the right end of the colon to the jejunum with

end-side, the ileum to transverse colon by a straight 75 mm stapler. Surgical procedure illustration was shown in Fig. 2. The surgery was carried out by a team of four gastrointestinal surgeons, and the main one has 26 years of specialty experience. The surgery lasted 5 h, the patient lost 300 ml of blood without blood transfusion during and after surgery. The operation went well without any complications.

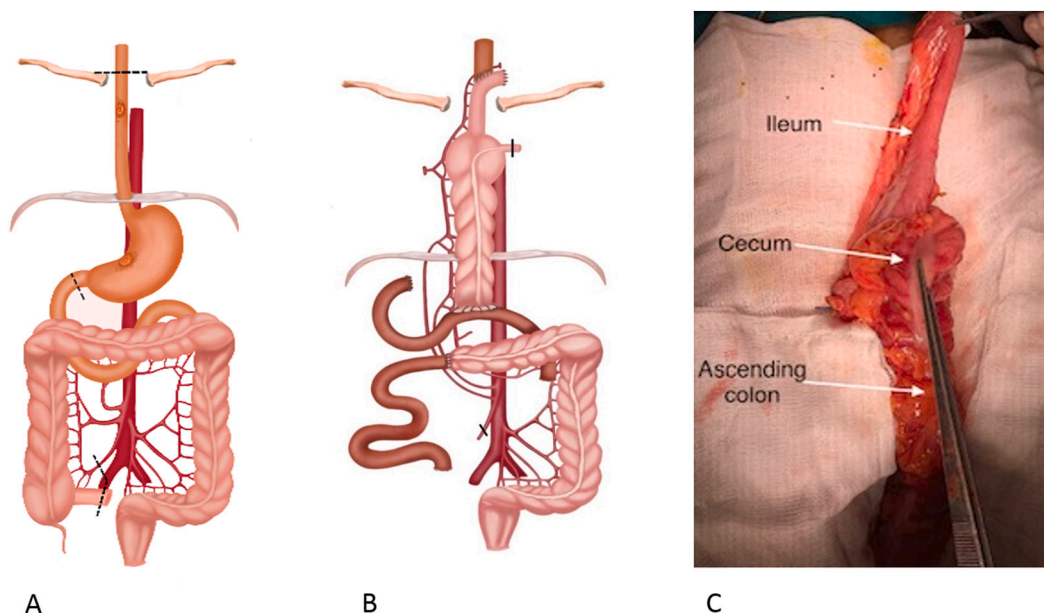
After surgery, the patient was awake, skin and mucosa are pink in color. During the first three days, he was completely nourished by 2000 Kcalo intravenously. On the 4th day, the patient was nourished by drip through the gastric tube and the venous tract. From the 5th to 7th day, patient had farts, and was fully nourished through the gastrointestinal sonde. At the 8th day, the gastric tube was dismantled, the patient could be fed with liquid by mouth, received food well, drainage at the neck and abdomen were withdrawn. The 1st day postoperative test showed red blood cells of 3.71 T/L, platelets of 211 G/L, white blood cells 14.2 G/L, prothrombin of 81%, total protein of 64 g/L, albumin blood of 26,4 g/L, GOT of 62 U/L, GPT of 54 G/L. Additional tests on the 3rd and 5th day after surgery were in the normal range. From the 9th day, the progress was good, the patient was able to eat 8 to 10 meals per day and drink soup by mouth and move around gently by himself.

The removed part comprised of 18 cm of the esophagus towards all the stomach. From the cut of the upper esophagus 3 cm was 2 cm membrane with rough texture. There was also an ulcerative small curvature of the stomach at 2 cm. Postoperative pathology was T1bNoMo for esophageal cancer, T2aNoMo for stomach cancer, chronic inflammatory lymph nodes 19 (Fig. 3). In the esophagus, fragments from surgery took esophageal tissues and the tumor tissues located in the mucosal layer. Tumor cell's nuclei are large, irregular, polymorphic, clearly visible, not seen differentiated keratinocytes. In the stomach,

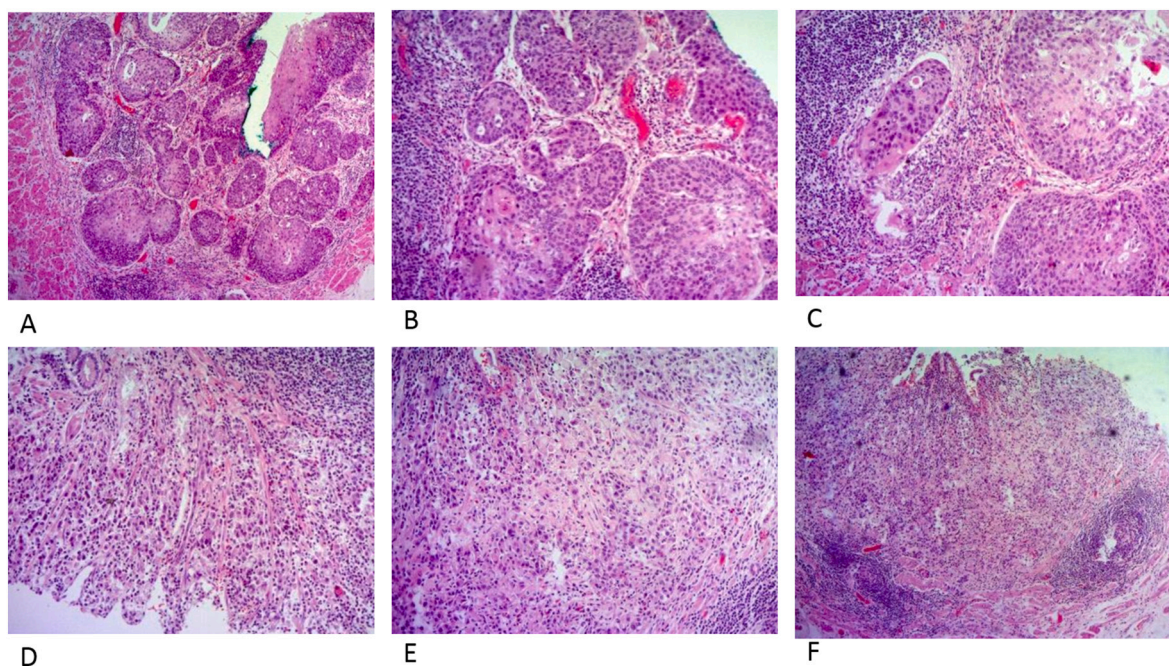


**Fig. 1.** Results of esophagoscopy, gastroscopy, and endoscopic ultrasound of the esophagus and stomach before surgery. A - A lesion of the esophagus not reflecting when lugol's solution was administered; B - A ulcer lesion at the corner of lesser curvature of stomach; C - A lesion at the esophagus; D - A lesion at the stomach.





**Fig. 2.** Surgical procedure illustration. A – A lesion and resection site; B - Upper gastrointestinal tract reconstruction; C - The patient's ileum, which was inserted through the mediastinum, was connected to the cervical esophagus.



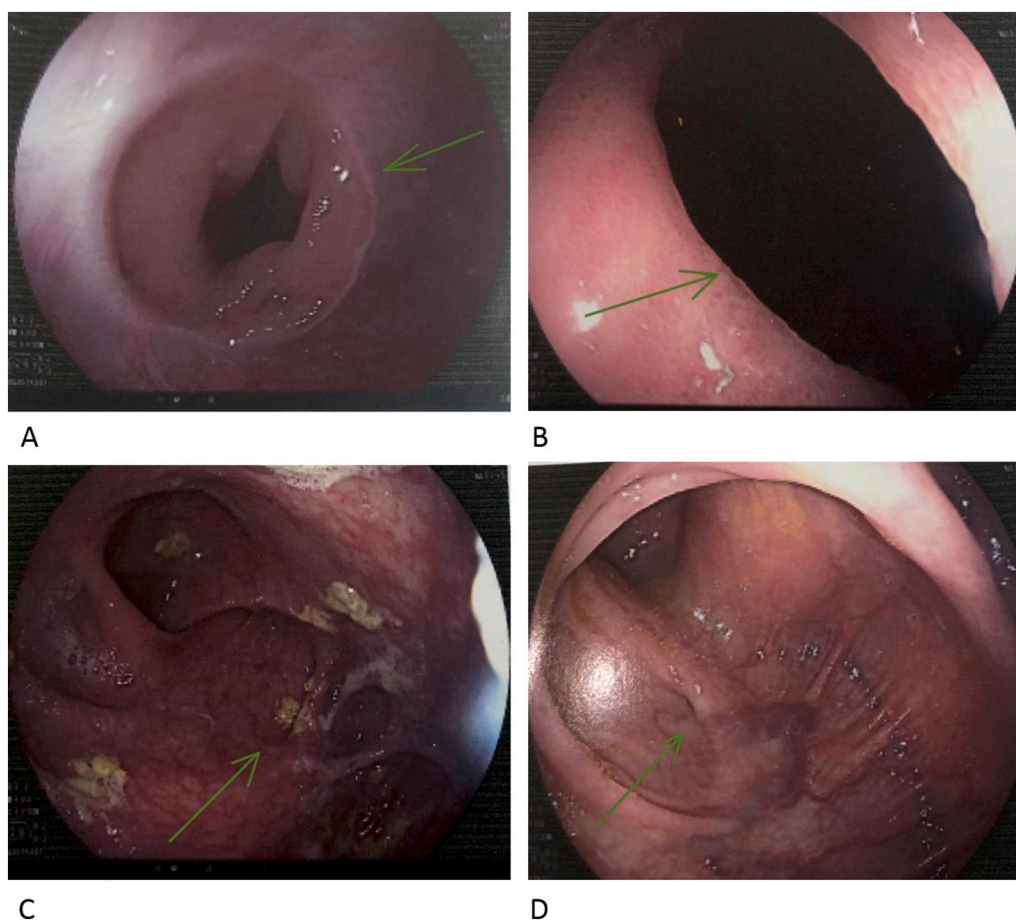
**Fig. 3.** Postoperative pathology was for esophageal cancer (A, B, C) for stomach cancer (D, E, F). A, B, C – Different regions of the esophageal squamous carcinoma; D, E, F - Different regions of the poorly differentiated gastric adenocarcinoma.

fragments from surgery took the stomach tissues and tumor tissues located in the mucosal layer. Tumor cell's nuclei are large, alkaline, with distorted nuclear membranes mostly in clumps. There were also regions of cells in ring shapes. The two ends cut of the esophagus and the stomach had no tumors. 19/19 lymph nodes were chronically inflamed.

The patient fully complied with all treatment orders, and well tolerated treatment indications. The patient did not receive any post-operative adjuvant treatment and were discharged from hospital at 12th day post-surgery. By 9-month post-surgery, follow-up and monitoring of him showed sign of well eating and weight gain by 3 kg. Upper gastrointestinal endoscopy showed membrane of the esophagus pink and smooth; the connection between the esophagus and the ileum was

normal and not constricted; Bauhin valve and right caecum were normal (Fig. 4). A chest and abdomen CT scan by this time showed no abnormal thicken membranes, no adipose infiltrations surrounding the colon. Contrasting agent was administered, showing to be well floated to the small intestine (Fig. 5). After surgery, both the patient and his family were delighted for a successful surgery without any medical complications and inconvenience caused in his daily life.

This case report has been reported in line with the SCARE Criteria [2].



**Fig. 4.** Results of upper gastrointestinal endoscopy 9 months after surgery (March 11st 2021). A - New connection of the esophagus to the ileum; B - van Bauhin; C - Caecum; D - right colon.

### 3. Discussion

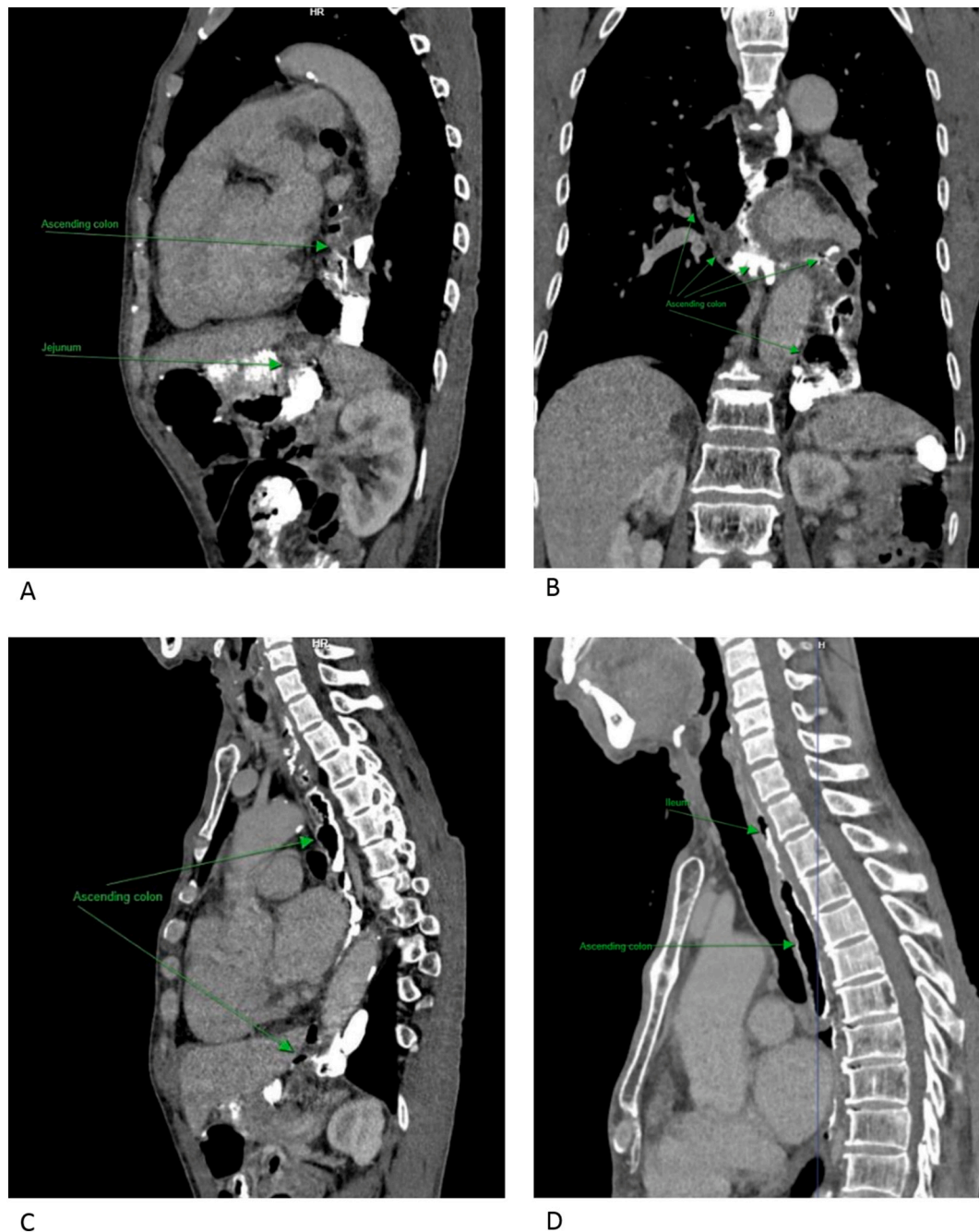
The presented case report demonstrated treatment for the first clinical case with both esophageal squamous epithelium carcinoma and gastric adenocarcinoma by operating esophago-gastrectomy and reconstruction of the upper gastrointestinal tract by using the ileum – right colon. This suggested that the stomach and colon were organs that could be used for reconstructing of the upper gastrointestinal tract, depending on the location, size, stages of the malignancy and the surgeons' clinical expertise and experiences. The case report could be served as a valuable reference for similar rare cases in the future.

Indications and surgery techniques for patients with concurrent cancers of the esophagus and stomach, in fact, have been reported in literatures. Motoyama et al. [3] described a method of removing the stomach at the lower, while preserving the upper-part of the stomach and right blood vessels, creating a gastrointestinal tract. Cutting the esophagus and connecting the gastroesophageal tube via the thorax were performed, while the Roux-en-Y jejunum stomach was used for dual cancer in the 1/3 lower esophagus and stomach at lower part. This technique was also successfully implemented by Yunpeng Zhao et al. for three cases of squamous carcinoma of the esophagus and adenocarcinoma of the stomach [4]. On that basis, it was suggested to remove the stomach at the distant part, preserving the blood vessels on the right side of the stomach, combined with Ivor Lewis esophagus being removed through thoracoscopy in patients with both esophageal cancer and adenocarcinoma of the stomach, when the esophageal tumor was at least 27 cm from the upper tooth arch, at stage IIA, and the gastric tumor was in distal part, at stage IA. When the stomach did not meet the requirement to retain its shape, the colon was an alternative. Ninh et al. [5]

reported a case of Ivor Lewis minimally invasive esophagus cutting, using the right colon to treat cardiac stomach cancer spreading to the gastric and lower third of the esophagus. Honda et al. [6] reported an endoscopy surgical case of thoracic esophagus removal, entire removed stomach and used right colon to reconstruct the upper digestive tract by connecting the esophagus to the colon at the thorax for the treatment of lower third esophageal cancer and middle third of stomach cancer. For this case report, our patient was at stage IB esophageal squamous epithelium carcinoma, located around 25 cm away from the teeth arch; and at stage IIA of poorly differentiated gastric adenocarcinoma at the angle of lesser curvature of the stomach. We did not remain the stomach and performed thoracoscopic Ivor Lewis esophagectomy with chest anastomosis, as in previous studies to prevent recurrence [4]. Therefore, we chose to reconstruct the upper gastrointestinal tract by connecting the upper part of the esophagus at the neck, to the ileum – right colon.

There was only one limitation in this case report is that we did not perform laparoscopic surgery to remove entire esophagus and stomach. It was because of abdominal opening first for thorough physical examination of the stomach damages, and of the ability to remove all or to preserve part of the stomach, as well as to assess and select the colon part for replacement of the upper digestive tract. Since the patient had no abnormal mediastinal lymph nodes, stage IB of esophageal damages. With esophageal cutting following the Orringer's method, we did not change patient's position but only then made a connection to recreate the circulation of the digestive tract after removing the thoracic esophagus and the entire stomach.





**Fig. 5.** CT scan results 9 months post-surgery (March 11st 2021). A – Colon part in the chest area and jejunum; B, C – Contrasting agent after swallowing was well floated from the colon part in the chest to the lower gastrointestinal tract. D – the ileum and colon in the chest area.

#### 4. Conclusion

It is possible to use the stomach or colon to shape the upper gastrointestinal tract in cases of simultaneous esophageal and stomach cancers. Using the right colon at the remaining 8 cm of the ileum and the Bouhin valve via a connection of the upper part of the esophagus at the neck, to the ileum – right colon, was a safe and effective method for concurrent esophageal and gastric cancers at the 1/3 middle.

#### Provenance and peer review

Not commissioned, externally peer-reviewed.

#### Ethics approval

Writing and publishing this case report was approved by Bach Mai hospital.

#### Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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**CRediT authorship contribution statement**

Conceptualization: MHT and HVM; Data curation: MHT and TKN; Formal analysis: MHT; Funding acquisition: MHT; Investigation: MHT; Methodology: MHT; Project administration: MHT; Resources: MHT; Software: MHT; Supervision: MHT and HVM; Validation: MHT and TPTT; Visualization: MHT, TPTT, and TKN; Roles/Writing - original draft: MHT and TPTT; Writing - review & editing: MHT, TPTT, TKN, and VMH.

**Declaration of competing interest**

The author reports no conflicts of interest in this work.

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