

Routine Esophagography with Oral Contrast is Not Necessary to Evaluate Esophagojejunal Anastomosis Integrity Following Total Gastrectomy

Cebraail Akyüz^{1*}, Oğuzhan Sunamak²

¹Gastroenterologic Surgery, Haydarpasa Numune Training and Research Hospital, İstanbul, Turkey

²Generals Surgery, Haydarpasa Numune Training and Research Hospital, İstanbul, Turkey

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*Corresponding author

Cebraail Akyüz

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Abstract: Anastomotic leak is clearly related to post operative morbidity and mortality. Evaluation of anastomosis by using oral contrast esophagography has been used in lots of centers to diagnose this complication. We showed that esophagography with water soluble oral contrast use in anastomotic leak diagnosis is of low sensitivity and it couldn't be used for screening. There are data supporting CT scan with oral contrast or endoscopic evaluation.

Keywords: Anastomotic leak, esophagojejunal anastomosis, contrasts imaging, gastrectomy.

INTRODUCTION

Anastomotic leak is an important complication with increased morbidity and mortality following gastric surgery for malignancy. In spite of advance in surgical technique and perioperative management, esophagojejunal (EJ) anastomotic leak rate has been still from 19 to 62% and related to high mortality [1-3]. Anastomotic leak causes undesired results like longer intensive care unit and hospital stay periods, increased economic cost and poor life quality [4, 5].

As anastomotic leak is highly related to post operative complications and mortality, contrast esophagography with oral water soluble contrast has been used routinely in most of surgery clinics, before starting oral feeding. However, importance of this imaging in patients without clinical symptoms is controversial.

Aim of this study is to analyze the clinical importance of esophagography with water soluble contrast which has been used in total gastrectomy patients during early period post-operative until now.

MATERIALS AND METHODS

Seventy-nine patients who underwent open total gastrectomy for gastric cancer between January 2015 and December 2017 were retrospectively analyzed. Total gastrectomies without routine D2 dissection performed for gastrointestinal stromal tumors, neuroendocrine tumors, lenfoma and benign lesions were excluded. Local ethical committee approval was taken (HNN, KAEK, 10.04.2018, 5740) and study was conducted in correlation with Helsinki declaration.

None of the patients had neither radiotherapy nor chemotherapy, preoperatively. D2 lymph node dissection was performed routinely in all patients. Antecolic Roux-en-Y esophagojejunostomy was used for reconstruction. 1st generation cephalosporin prophylaxis was used. There was no positive surgical margin in any of the patients (peroperative frozen section was done in suspicious cases and, if positive, resection was extended until negative margin was

succeeded). EJ anastomosis was performed with circular stapler (EthiconEndo-Surg, Inc. Cincinnati, OH, USA- 25 mm). The integrity of staple line was checked visually in 74 patients and found adequate. 3/0 polypropylene support-sutures were used in 5 patients. Hand-sewn double layer jejunojenunal anastomosis was performed 40 cm distal to EJ one. Jejunal and duodenal stumps were closed with linear stapler. Two abdominal drains were placed in front and behind of anastomosis, from right and left upper quadrants, respectively. Intraoperative leak test was not done in any of the patients. All patients were started enteral feeding by nasojejunal tube in early post operative period and gradually increased depending on patient's tolerance.

All patients were swallowed water soluble contrast on the 5th post operative day and dynamic esophagography at different angles were taken under fluoroscopy (Urografin® % 76 50 ml, Bayer, Berlimes SA, Madrid, Spain). Extravasation of contrast was accepted as anastomotic leak. Clavian- Dindo

classification was used in patients with proven anastomotic leak diagnosis to assess severity of surgical complication [6]. Oral fluid intake was started immediately and increased gradually in patients without neither clinical symptoms nor radiological leak findings. Abdominal drains were removed on 6th and 7th days in asymptomatic patients.

MedCalc Statistical Software Version 12.7.7 program was used for statistical analysis (Med Calc Software bvba, Ostend, Belgium; <http://www.medcalc.org>; 2013). Categorical variables were frequency (N) and percent (%).

FINDINGS

The mean age of patients was 64.45±11.89. Male/female ratio was 3.3/1. Splenectomy in 11, distal splenectomy in 3, transverse colon resection in 2 and cholecystectomy in 8 of the patients were performed. Patient demographics, clinical properties, per and post operative outcome were shown in table 1. Anastomotic leak was diagnosed in 8 of the patients. One patient was died because of leak-related complications.

While esophagojejunal anastomosis was tested by means of esophagography with oral water soluble contrast swallow in 69 patients, it was not possible in 10. Three of these 10 patients in whom anastomotic leak check was not possible developed anastomotic leak.

When clinically suspected (presence of fever, abdominal pain, distention, increased CRP), CT scan with oral contrast was taken before the 5th day. Primary repair+ drainage operation was performed in one patient because of more than 50%. Anastomotic dehiscence. This patient was died in intensive care unit, because of septic complications on the 7th post operative day. Endoscopic stenting in one and percutaneous catheter drainage in the other because of perianastomotic collection, were performed in remained two patients, respectively.

Fluoroscopic imaging could make diagnosis in only 3 of 5 patients with anastomotic leak; CT scan detected the anastomotic leak in remained two symptomatic patients. CT scan was also taken in anastomotic leak-detected patients by fluoroscopy for accompanying possible complications and treatment plan. Clavivien-Dindo classification of the patients with post operative EJ anastomotic leak and our treatment plan were given in table 2.

While anastomotic leak in 5 patients with oral contrast esophagography was diagnosed, CT scan taken on clinical suspicion revealed the leak in two patients with negative esophagography. Sensitivity, specificity and negative predictive value of esophagography was found as 60%, 100% and 25%, respectively (table 3).

Table-1: Patients’ demographics, per and post-operative data of the patients

	No leak; n (%)	Leak +; n (%)
Age (years)	61.33±12.92	70.25±5.14
Gender		
Male	54 (68.3)	7(8.8)
Female	17(21.5)	1(1.2)
ASA		
ASA 1	6(7.6)	-
ASA 2	16(20.2)	1(1.2)
ASA 3	42(53.1)	5(6.3)
ASA 4	7(8.9)	2(2.5)
Pathological staging		
Stage 1	1(1.2)	-
Stage 2	7(8.9)	-
Stage 3	59(74.7)	6(7.6)
Stage 4	4(5.1)	2(2.5)
Operation duration (min)	264.64±28.07	298.25±32.57
Hospital stay (day)	6.94±1.01	29.28±3.32

ASA: American Society of Anesthesiologists Classification

DISCUSSION

Esophagojejunal anastomotic leak is related to high morbidity and mortality, and early diagnosis is important as it might change choice of treatment method [7, 8]. EJ anastomotic leak rate was 10.1 in our study and was significantly high compared to mean rate of 4.4% of Japan study [9]. Some authors related anastomotic leak ratio to the experience of surgeon [10,

11]. In our study, at least one experienced surgeon involved in the management of the patient. However, age, respiratory distress, extent of lymph node dissection, additional organ resection, operation duration, amount of blood loss, intra-post operative transfusion might also increase anastomotic leak risk [12]. We could detect the leak only in 3 patients (60%) out of 5 by using oral contrast esophagography.

Esohagography failed in 2 (40%) of the patients in whom CT scan taken because of suspicious clinical symptoms made the diagnosis. There is data reporting that oral contrast esophagography has a low sensitivity to detect anastomotic leak [1, 13, 14]. Moreover, it was reported to increase aspiration pneumonia risk [15].

Thus, oral contrast esophagography should be used in patients with accompanied clinical and laboratory findings, instead of its routine use. Ten patients couldn't be evaluated with oral contrast esophagography.

Table-2: Classification of the patients with anastomotic leak according to te Clavien Dindo classification

Patient number	Grade	The first therapeutic approach	Change in anastomotic leak	Hospital duration (after 1 st surgery)
1	IIIa	endoscopic	decreased	27
2	II	conservative	--	31
3	II	conservative	--	29
4	IIIa	Percutaneous + endoscopic	decreased	35
5	II	conservative	--	26
6	IIIb	Laparotomy(post-operative 3 rd day following the first surgery)	unknown	Postop 7 th day excitus
7	IIIa	endoscopic	decreased	25
8	IIIa	endoscopic	decreased	32

Table-3: Specificity, sensitivity, positive and negative predictive values of oral contrast esophagography

Spesifite	100
Sensivite	60
PPV	100
NPV	25

PPV: positive predictive value. NPV: Negative predictive value

These patients had abdominal CT scan with oral and intravenous contrast within 5 post operative day because of such symptoms and findings as fever, abdominal pain, tachycardia, increased CRP, purulent or intestinal content in drain tube and, anastomotic leak was diagnosed in 3 patients. Further investigation was not needed in remained 7 patients. CT scan with oral contrast is a preferred imaging method by surgeons. It has advantages of not only diagnosing anastomotic leak, but also verification of perianastomotic fluid or abscess collection, guidance for percutaneous intervention, and detection of other underlying causes of sepsis [16]. Strauss *et al.* reported the sensitivity of oral contrast esophagogram and contrast CT scan taken on 7th post operative day, as 45.4% and 54.5% respectively [17]. Lee *et al.* reported that, fluoroscopic imaging, following CT scan taken because of in clinical suspicion, confirms anastomotic leak diagnosis. Thus, they suggested CT scan as first step [18]. These studies make us think that CT scan should be taken when clinical suspicion is present, instead of routine used.

Endoscopy is a valuable diagnostic tool in anastomotic leak evaluation. It can both enable us to evaluate anastomotic integrity, tissue viability; and guide endoscopic therapeutic interventions. It is considered to be safe when performed at low insufflation pressure. Although routine endoscopic evaluation is not suggested during post operative period, its sensitivity is 100% for ischemia and anastomotic leak when clinical suspicion is present [15, 19]. Limitations of our study were low number of

patients, being a retrospective study and inability to comparison with CT and endoscopy.

CONCLUSION

As a result, use of routine esophagography with water soluble contrast swallow for screening provides a low benefit. Because of its low sensitivity and high negative predictive values, routine use is not necessary. There are clues supporting benefits of oral contrast CT scan or endoscopy to evaluate anastomotic integrity and to plan treatment strategy, if clinical suspicion is present.

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