



SURGICAL TREATMENT OF ESO-GASTRIC CANCER: ABDOMINAL APPROACH VS. ABDOMINO-THORACIC APPROACH

Ene D., Turculeț C., Haiducu Carmen

Department of Surgery, Clinical Hospital Emergency, Bucharest

Abstract. The surgical approach of eso-gastric tumours is extremely difficult because of the regional anatomical and functional particularities, thus deciding the correct surgical attitude is essential. Objective. The purpose of this study is to compare the surgical outcome of patients with abdominal approach of eso-gastric tumours versus the abdomino-thoracic one. Although tackling the oesophageal-gastric junction is difficult on its own, the main goals are a R0 resection and as little invasive operations as possible. Materials and method. Our study is an observational, retrospective study of immediate postoperative outcome in terms of morbidity and mortality. During 2000-2010, we assessed 79 patients, from the Clinical Emergency Hospital in Bucharest and the Clinical Hospital in Craiova, in terms of early postoperative outcome after eso-gastric cancer resection. We decided to enrol patients from two medical centres because of a low incidence of eso-gastric tumours in our country. Conclusions. The abdomino-thoracic approach should be avoided due to its major complications. The abdominal approach may be implemented in type I tumours as well, in addition to types II and III. The abdomino-thoracic approach allows a correct oesophageal resection above the tumour, as well as a thorough mediastinal lymph node dissection and it is mainly indicated in type Siewert I tumours. The operative mortality was 0% for both surgical approaches. The postoperative mortality rate was 15.18%.

Keywords: eso-gastric tumours, surgical treatment

Introduction

The often difficult approach of eso-gastric tumour junction due to anatomic-functional particularities makes the selection of the type of surgical intervention extremely important. This choice must be taken based on the tumour's type and stage as well as on the patient's biological particularities (co morbidities).

An attempt to provide an anatomic-clinical definition of eso-gastric junction cancer was made by O Siewert JR and Stein HJ in 1996 (*Dis. Esophagus* 1996; 9:173-82); cardia carcinoma is the adenocarcinoma whose epicentre is within the limits of 1.5 cm (1.97 inch) proximal or distal from the eso-gastric junction. This notion targets malign tumours of the terminal oesophagus and of the proximal stomach (of the cardia) which are difficult to determine in 30% of cases (Haggit proposes that this cancer be labelled as oesophageal if the tumour develops on 75% of the oesophagus).

In 2000, World Health Organization and the International Agency for Research on Cancer established the following classification criteria of eso-gastric junction adenocarcinoma [1]:

- Adenocarcinomas which cross the eso-gastric junction are defined as eso-gastric junction adenocarcinomas, irrespective of the area with a larger tumoral volume;
- Adenocarcinomas located totally above the eso-gastric junction are considered oesophageal adenocarcinomas;
- Adenocarcinomas localised totally below the eso-gastric junction are considered proximal gastric adenocarcinomas or corporeal adenocarcinomas, depending on their size;

Siewert's and Stein's classification of junction adenocarcinomas has begun to be more and more accepted, with emphasis on the tumoral heterogeneity and the need for a different surgical approach. In 1998, Siewert and Stein established a definition of the eso-gastric adenocarcinoma, namely tumours whose epicentre is within the limits of 1.97 inch (5 cm) proximal or distal from the eso-gastric junction. Three distinct entities were identified [2].

- type I – adenocarcinomas of the distal oesophago-

Dragos Ene

8, Calea Floreasca Str., Sector 1, Bucharest
email: dragoshene@yahoo.com

gus, localized at 1-5 cm above the eso-gastric junction, grown on specialised intestinal metaplasia areas (MI) - Barrett oesophagus (EB);

- type II – authentic cardiac carcinomas located at 1 cm proximal and 2 cm distal from the eso-gastric junction, grown on the cardiac epithelium, on a short segment of junctional metaplasia;
- type III - subcardial gastric carcinomas which infiltrate the eso-gastric junction, the distal oesophagus or both, located at 2-5 cm distal from the cardia.

It is well known that the conical inflammation is the substrate of intestinal metaplasia, irrespective of aetiology [3].

Proximal invasion is facilitated by the lack of serous, the distal esophagus' invasion whose source is the cardiac or junction adenocarcinoma prevails for 53% of the cases. This process occurs at all strata, especially at the level of the submucosa and muscularly mucosa [4].

For most cases, distal esophagectomy is imposed, with a hard to establish proximal limit. [5]

Despite that evaluation of the transmural invasion through endoscopic ultrasound is recommended, intraoperative exploration by longitudinal esophagotomy is a safer procedure, in order to validate the sections' precision into the healthy tissue and the lack of invasion by histological extemporaneous confirmation. The surrounding organs (diaphragm, spleen, pancreas, omental bursa) resist to the local invasion, whereas the absence of a lymphatic barrier between the stomach and oesophagus permits the invasion of the lesser curvature of the stomach. Advanced cardia cancers, with serious invasion frequently invade the gastric portion, requiring total gastrectomy [6].

Depending on the tumour type, the resected piece must contain the thoracic and abdominal oesophagus together with the lesser curvature of the stomach for tumoral type I, 4-6 cm of the oesophagus situated above the tumour, the whole stomach, the large caud and spleen for tumoral type II and III [7].

Material and method

Early post operative results in the treatment of eso-gastric junction cancer were assessed at a lot of 79 patients operated on during 2000-2010 in the surgery clinics of Bucharest Emergency Hospital and County Clinical Hospital in Craiova. The reason we cumulated the patients' lot from two centres is the relatively small number of cases.

The study is an observational, retrospective analytic study, with the assessment of the immediate postoperative results, from the perspective of morbidity and mortality.

Results

The data from our own casuistry is presented below. Out of the 79 cases, 48 had resections with radical visa, while 31 had resections with palliative visa.

Type of surgical interventions:

- Surgery 1: total gastrectomy with distal esophagectomy through abdomino-transhiatal approach (Hill procedure)
- Surgery 2: total gastrectomies with distal esophagectomy through thoraco-freno-laparotomy
- Surgery 3: total gastrectomies and upper polar subtotal esophagectomies through abdominal and thoracic incisions
- Surgery 4: subtotal esophagectomy with the resection of the lesser curvature of the stomach by abdomino-cervical route/total gastrectomies with subtotal esophagectomies by abdomino-cervical route

We examined the differences between the survival functions at groups defined by the type of tumour, gastric resection and surgical approach. The method we used was Kaplan-Meier and the Log-Rank test.

Type of surgery:

In the act of comparing the survival functions for surgeries 1 and 2, 59 subjects were analyzed: 37 subjects with type 1 surgery, of whom 4 were uncensored (they deceased during the trial) and 33 censored (they survived the final moment of the trial) and 22 subjects with type 2 surgery of whom 1 was uncensored and 21 censored.

In the act of comparing the survival functions for surgeries 2 and 3, 40 subjects were analyzed: 22 with type 2 surgery of whom 1 was uncensored and 21 censored; 18 subjects with type 3 surgery of whom 8 uncensored and 10 censored.

When relating the survival functions for type 2 and 4 surgeries, 24 subjects were assessed: 22 subjects with type 2 surgery of whom 1 uncensored and 21 censored; 2 subjects with type 4 surgery of whom 0 uncensored and 2 censored.

Tumoral type:

In comparing the survival functions for tumour type I and type II, 3 subjects were analysed: 11 subjects with type I tumour of whom 1 uncensored and 10 censored; 22 subjects with type II tumour of whom 2 uncensored and 20 censored.

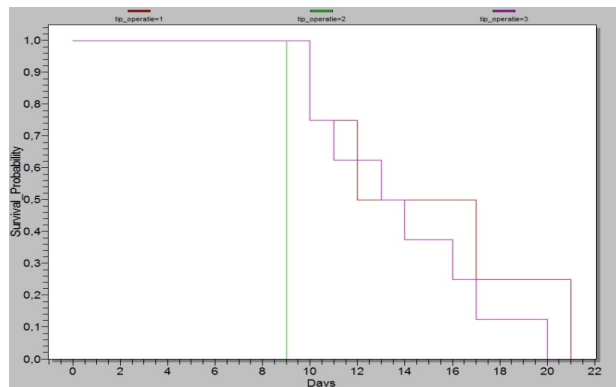
In comparing the survival functions for tumour type II and III 68 subjects were assessed: 22 with type II tumour of whom 2 uncensored and 20 censored; 46 subjects with type III tumour of whom 10 uncensored and 36 censored.

In comparing the survival functions for tumour type I and III, 57 subjects were analyzed: 11 subjects with type I tumour of whom 1 uncensored and 10 censored; 46 subjects with type III tumour of whom 10 uncensored and 36 censored.

Surgical approach:

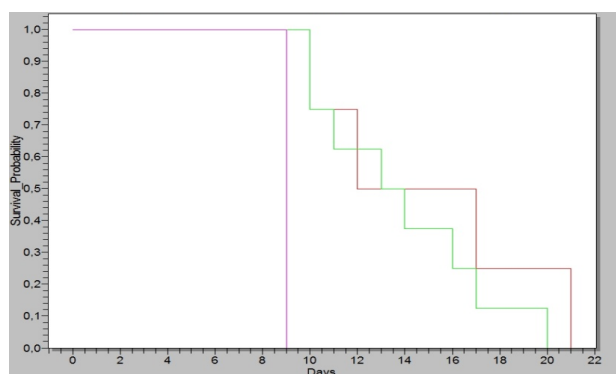
In comparing the survival functions for approach 1 (abdominal) and approach 2, 59 subjects were under assessment: 37 subjects with approach 1 of whom 4 uncensored and 33 censored; 22 subjects with approach 2 of whom 1 uncensored and 21 censored.

In comparing the survival functions for surgery approaches 1 and 3, 55 subjects were assessed: 37 with surgery approach 1 of whom 4 uncensored and 33 censored; 18 with surgery approach 3 (abdomino-thoracic) of whom 8 uncensored and 10 censored.



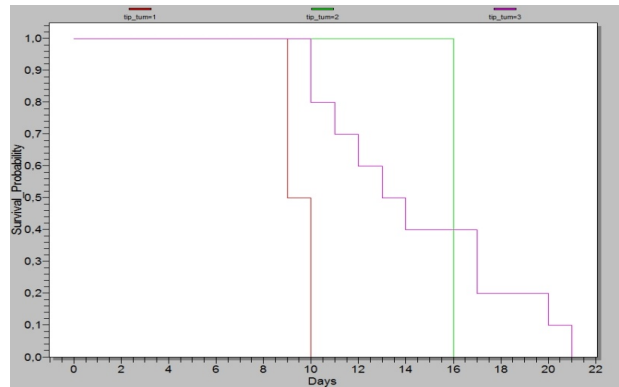
Test	Statistic	D.F.	P-Value
Log-Rank	12,6132	2	0,0018
Wilcoxon	12,1416	2	0,0023

Grafic 1. Influence of the type of surgery in terms of postoperative survival



Test	Statistic	D.F.	P-Value
Log-Rank	12,6132	2	0,0018
Wilcoxon	12,1416	2	0,0023

Grafic 2. Influence of the type of tumor (Siewert Classification) in terms of postoperative survival



Test	Statistic	D.F.	P-Value
Log-Rank	8,0257	2	0,0181
Wilcoxon	8,2327	2	0,0163

Grafic 3. Relevant type of surgical approach in terms of postoperative survival

Morbidity and mortality

The factors that influence postoperative mortality are directly connected to the selection of patients by a better postoperative staging (laparoscopy usage for large tumours), to the improvement of surgical procedures and of the surgical approach personalized for every patients, depending of the biologic status. Also, prophylactic use of anticoagulants led to the removal of death causes by thromboembolic complications.

The use of monofilament relon thread for the closing of the abdominal wall decreased the extensive parietal suppurations and evisceration.

Postoperative mortality in the examined lot was 15.18%.

Type of complication	Number of cases
1. Anastomotic fistula	9
2. Pulmonary complications	6
3. Duodenal bond	1
4. Extensive parietal suppurations and evisceration	1
Total	17

Table I. Postoperative complications

Type of complication that led to death	Number of cases
Anastomotic fistula	9
Bronchopneumonia	3
Total	12(15.18%)

Table II. Postoperative complications that led to death

The 79 patients in the studied lot did not present severe associated comorbidities. This was one of the selection criteria of patients in view of leaving unaltered the postoperative results and evolution

of the two surgical approaches. It is a fact, that associated cardiovascular and pulmonary pathology represents from the very beginning a complication risk for patients with thoracotomy.

Conclusions

1. The results from the two centres on the studied lot are:

Abdomino-thoracic surgery approach is to be avoided due to massive complications;

Abdominal surgery approach can be used for type I tumour and not only for types II and III, since operative mortality is 0% and immediate postoperative mortality- 15,18%

2) Paraclinical investigation of patients and an accurate establishment of the tumour type in a preoperative stage improve the processes of evolution and recovery.

3) Anastomotic fistulas and pulmonary affections represented the most alarming post operative complications.

4) The abdominal and abdomino-cervical surgery approaches are superior to the abdomino-thoracic approach by avoidance of respiratory complications (respiratory dynamics, respiratory infections, mediastinitis) and cardiac complications.

5) The abdomino-thoracic approach permits a proper supratumoral oesophageal excision, as well

as a total mediastinal lymphadenectomy, the main indicator being Siewert I tumoral type.

6) Any fistula type postoperative complications are detected and taken care of easier, in the case of an abdomino-cervical approach, with a conservative therapeutic potential.

References

1. **Stanley R. Hamilton, Lauri A. Aaltonen.** Pathology and Genetics of Tumours of the Digestive System - *World Health Organization Classification of Tumours*, Lyon 2000, 31-32.
2. **Siewert JR, Stein HJ.** Classification of adenocarcinoma of the esophagogastric junction. *Br J Surg* 1998;85:1457-1459.
3. **Chang JT, Katzka DA.** Gastroesophageal reflux disease, Barrett esophagus, and esophageal adenocarcinoma. *Arch Intern Med.* 2004; 164(14):1482-8.
4. **Sobin LH, Wittekind Ch (eds).** Union Internationale Contre le Cancer (UICC): TNM-Classification of Malignant Tumors, ed 5. New York, Wiley-Liss, 1997.
5. **Rudiger Siewert J, Feith M, Werner M, Stein HJ.** Adenocarcinoma of the esophagogastric junction: results of surgical therapy based on anatomical/topographic classification in 1,002 consecutive patients. *Ann Surg.* 2000 Sep;232(3):353-61.
6. **Se'gol P, Salame E, Bonvalot S, Maurel J, Gignoux M.** Technique actuelle des plasties gastriques en chirurgie œsophagienne. *Ann Chir Paris* 1996;50:13-20.
7. **Bains MS.** Ivor Lewis esophagectomy. *Chest Surg Clin North Am* 1995;5:515-26.