



**ORIGINAL RESEARCH PAPER**

**General Surgery**

**STAGING LAPAROSCOPY AS A ROUTINE PROCEDURE IN THE MANAGEMENT OF ADVANCED GASTRIC CANCER.**

**KEY WORDS:** Gastric Cancer, Staging Laparoscopy

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**ABSTRACT**

In patients with stomach cancer, computerized tomography (CT) has a low sensitivity in the detection of secondary deposits in the peritoneum. The aim of this study is to evaluate the advantage of simplified staging laparoscopy (SSL) in patient with advanced gastric cancer. We evaluated retrospectively patients diagnosed with clinically advanced adenocarcinomas of the stomach and esophagogastric junction (Siewert's type II and III) submitted SSL between April 2009 and June 2015. All patients underwent CT and 43.9% underwent eco-endoscopy (ECOENDO). A total of 196 patients with locally advanced gastric cancer were selected for SSL, 6 patients fail to perform due technical difficulties (3%). Surgeons made biopsies during SSL in 64 patients and 64.6% of those were confirmed histologically as metastatic disease. It means that 22.1% uptake to M1 after SSL. SSL has shown to be a valid method to evaluate radiologically occult metastasis, improving stomach cancer staging, decreasing the number of exploratory laparotomies.

**INTRODUCTION:**

It is estimated that around 990,000 new cases of stomach cancer have been diagnosed in the year 2012 worldwide (1,2). Is the fifth most frequent cancer being the second cause of cancer death. In 2011, there were 2346 new cases in Portugal, being the majority of these cases at the time of the diagnosis at advanced stages (3). Patients with stage IV stomach cancer have 5 year survival rates of about 4% (4,5) and surgery does not modify the prognosis, which in this case is indicated only for symptomatic treatment (perforation, obstruction or bleeding).

The computed tomography scan (CT) used in the staging of stomach cancer patients has a 66-77% (6) acuity, but reduced sensitivity for the detection of peritoneal lesions, including the hepatic surface, if less than 5mm (6). Thus, image sub-staging does not infrequently occur (7), which can lead to 30% of exploratory laparotomies (8,9). The role of staging laparoscopy in primary stomach cancer is to identify the presence of peritoneal disease (10,12,13), thereby saving stage IV patients (M1) from the morbidity of a laparotomy (11). This paper aims to evaluate the impact of staging laparoscopy in the management of stomach cancer in a specialized unit of an of national oncologic reference center.

**METHODS:**

We retrospectively evaluated patients diagnosed at our institution with gastric adenocarcinoma and Siewert's type II and III esophagogastric junction (EGJ) adenocarcinoma, who underwent simplified staging laparoscopy (SSL) between April 2009 and June 2015. We excluded patients who underwent neoadjuvant therapy and patients with obstructive symptoms or bleeding prior to SSL.

All patients were diagnosed and staged with a clinical history and physical examination, upper gastrointestinal endoscopy (UGE) with biopsy (review of slides when referenced from the

outside), and thoraco-abomino-pelvic CT (TAPCT). We performed echo-endoscopy (ECOENDO) in patients who did not present with suspected adenopathies in the TAPCT, to clarify the locoregional staging. Patients staged clinically as  $\geq T3$  and / or N + and M0, who are candidates for perioperative chemotherapy (ChT) and without contraindication for laparoscopy, underwent SSL in the operative room under general anesthesia.

Patients were placed in dorsal supine position and two trocars were introduced: 10 mm supra-umbilical and a 5 mm trocar in the right flank after induction of pneumoperitoneum (Figure I). We performed a systematic inspection of the abdominal cavity, including the hepatic surface, diaphragm and peritoneum. We collected ascitic fluid or, when absent, we used 200cc saline and collected peritoneal lavage on the supra-mesocolic floor, in the parietal-colic drips and pelvic cavity for cytological examination. Whenever we identified suspicious lesions (peritoneal or hepatic) we performed biopsies (Figure II). Lymph node biopsies and resectability screening were not performed routinely. Patients were admitted to a one day surgery (ODS) program and the results were evaluated in a multidisciplinary consultation.

We considered M1 patients with histological or cytological confirmation of metastasis. Patients re-staged as M1 were treated with definitive ChT according to the treatment protocol of the Medical Research Council Adjuvant Gastric Infusion Chemotherapy (MAGIC) (14). All peritoneal implant blades and ascitis/peritoneal lavage cytology were revised by a pathologist dedicated to gastrointestinal pathology. Data were obtained from clinical records and treated with SPSS. Continuous variables are presented as mean (standard deviation) or median (interquartile range) if they present normal distribution or not, respectively. Categorical variables are presented as absolute values and frequencies.

**Figure I**



a- Port of 10 mm for the laparoscopic camera.  
 b- Port of 5 mm in the right flank: work port used for serum instillation and aspiration and, when necessary, biopsies.

**Figure II**



Suspected implant biopsy in the right diaphragmatic dome.

**RESULTS:**

During the defined period of study, we identified 196 SSL candidates (Table I), of whom six did not complete the procedure due to technical difficulties (97% execution rate). All patients were staged with TAPCT and 43.7% also with ECO-ENDO. The pre-SSL staging was 78.7% cT3 and cT4 and 71.1% cN+. In 28.6% of the patients, the tumor had a limited localization to the antrum (distal) while the remainder had extension to the stomach body and EGJ (types II and III of Siewert). SSL was suspected by the surgeon for peritoneal disease in 64 patients, who underwent biopsies, and was confirmed histologically in 42 patients. In this population, 22.1% had a redefinition of their staging for M1 after SSL. There were 3 patients with positive cytology and no macroscopic evidence of metastases (Table II, Flowchart I).

**Table I – Demographic characteristics**

Characteristics	Number of patients (n=196)	Percentage
Age median (years)	65 years (interpercentil variation 55-70)	-
Gender		
Masculin	130	66,5
Feminin	66	33,5
Location of the tumor		
Distal (limited to gastric antrum)	56	28,6
Proximal (gastric body and EGJ)	140	71,4
Degree of histologic differentiation		
G1	21	21,0
G2	35	17,9
G3	84	42,9
Not classifiable	56	18,2

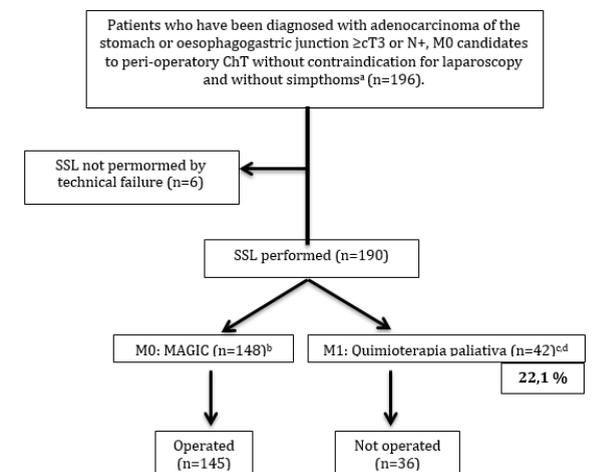
Histologic type (OMS)		
Tubular	50	25,5
Poorly cohesive	61	31,1
Mix	14	7,4
Mucinous	20	10,2
Other/ Not classifiable	51	25,8
TAPCT		
Yes	196	100
No	0	0
ECOENDO		
Yes	86	43,9
No	110	56,1
SSL performed		
Yes	190	97,0
No	6	3,0

**Table II –SSL results**

SSL results	n=190	Percentage
SSL suspected <sup>b</sup>		
Yes	64	33,7
No	126	66,3
Citology <sup>c</sup>		
Positive	27	14,2
Negative	163	85,8
Peritoneal disease <sup>c</sup>		
Yes	38	20,0
No	152	80,0
Positive		
Sim	42	22,1
Não	148	77,9
Submitted to surgery <sup>d</sup> after SSL		
Yes	151	79,5
No	39	20,5

- a- Adhesions (n = 5) or anesthetic limitation (n = 1).
- b- Identification of intraperitoneal lesion with biopsy.
- c- After histological analysis. There were 3 patients with positive cytology but no evidence of macroscopic disease.
- d- Curative intention surgery or palliative surgery.

**Flowchart I**



- a- Symptoms: obstruction, perforation or hemorrhage.
- b- There were 3 M0 patients who have not been operated (institution abandonment or progression).
- c- We performed the Masuda et al protocol in 3 patients with positive cytology but no evidence of macroscopic disease.
- d- There were 3 M1 patients who needed palliative surgery

(hemorrhage and obstruction).

**DISCUSSION:**

Our results show that SSL allowed to avoid the morbidity of an exploratory laparotomy in 22.1%, showing to be a valid method for the detection of metastases missed by CT in patients with gastric adenocarcinoma / Siewert II and III EGJ adenocarcinoma. The high rate of radiologically non detected M1 is consistent with other studies in western populations (15,16,17). Considering the short survival expected for M1 patients, palliative resection surgery is of short benefit. (18,19,20). Effectively, only 3 patients required palliative surgery for symptoms (obstruction, perforation or hemorrhage) which makes SSL even more relevant in the approach of these patients.

Routine staging laparoscopy in its simplified form makes the procedure feasible in ODS and serves the purpose of identifying patients with occult peritoneal metastases. More complex methods that target lymph node staging or resectability, besides being more time-consuming, would have no influence on therapeutic management, according to the MAGIC protocol (21). In our institution patients are treated according to the protocol MAGIC in which curative intention surgery takes place after preoperative chemotherapy.

Regarding the fact that SSL is performed separately from curative intention surgery, this seems to be the best strategy as a way of reassessing false positives or negatives. Specifically, 64 cases of with macroscopic suspicion were considered, and the result was confirmed histologically in 42 cases. On the other hand, the opportunity to perform cytology in the peritoneal lavage, detected 3 patients with positive cytologies, although macroscopically unsuspected. It should be noted that these three cases were treated with extensive intraperitoneal lavage and potentially curative gastrectomy. According to Masuda et al study, these patients, considered M1, may represent a subgroup with an intermediate prognosis (22).

This study has the limitation of being a retrospective study and based on clinical records, however it fulfills the objective of evaluating a treatment methodology. We believe that this is the only study performed in Portugal on staging laparoscopy in stomach cancer.

In conclusion, we recommend the use of SSL in patients with adenocarcinoma of the stomach and EGJ types II and III of Siewert adenocarcinoma, staged as  $\geq T3$  and / or N + and M0 imaging.

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