

Evaluation of Effectiveness of Diagnostic Laparoscopy in Staging of Gastrointestinal and Hepatobiliary Malignancies: A Retrospective Study from a Tertiary Care Center

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Received on: 01 July 2022; Accepted on: 20 February 2023; Published on: 19 December 2023

ABSTRACT

Objective: To evaluate the role of diagnostic laparoscopy for staging in gastrointestinal (GI) and hepatobiliary malignancies and to avoid unnecessary laparotomies.

Materials and methods: We conducted a retrospective review of the medical records of all patients admitted to the Department of General Surgery, SCB Medical College and Hospital, Cuttack, Odisha, India from 2011 to 2021. The patients having abdominal malignancy were admitted to Surgery Department and following procedures undertaken that is history taking, clinical examination, routine examination, and special investigations. After initial assessment, they were subjected to laparoscopy.

Results: The study group had 30 cases (13 males and 17 females): 15 cases of stomach tumors; 13 cases of colorectal and 2 cases of biliary tract tumors. Laparoscopy could accomplish proper staging in 29 cases (96.7%) that is the sensitivity of staging laparoscopy is 0.97 and the specificity of the test is 1. Unnecessary and futile laparotomies were avoided in 13 patients (43.3%). Only 1 patient (3.3%) had to be subjected to laparotomy following staging laparoscopy and was found to be unresectable. Staging laparoscopy means duration in the resectable group was found to be 17.35 minutes which was lower than the mean duration in the unresectable group which is 20.76 minutes. There were no complications in 25 (83.7%) and only 5 (16.7%) had complications, in which 3 (10%) had operative wound sepsis, 2 (6.7%) had major respiratory complication. Staging laparoscopy was associated with decreased morbidity and pain, faster recovery and quicker initiation of adjuvant therapies.

Conclusion and interpretation: Staging laparoscopy has a very significant role in abdominal malignancies. It is very accurate in assessing peritoneal seedlings, and hepatic metastasis which are not found in imaging modalities. It is found to be more useful in staging gastric and extra-hepatic biliary tumors compared to colorectal cancers. It gives additional information regarding the extent of the disease intra-abdominally which changes the course of management in a significant number of patients. It has added benefit of performing biopsy from sites of dissemination and having histological confirmation. It spares malignancy patients from unnecessary laparotomies thereby decreasing hospital stay and cost expenditure when compared to open exploration.

Keywords: Appendectomy, Calot's triangle, Diagnostic laparoscopy.

World Journal of Laparoscopic Surgery (2023): 10.5005/jp-journals-10033-1551

INTRODUCTION

One of the most prevalent cancers in humans is abdominal cancer. The purpose of this study is to determine if a laparoscopic approach is more accurate in patient management than open exploration. Many individuals with abdominal cancer are discovered to be unable to undergo resection during the investigation process. In this group of individuals, laparoscopy has been proposed as a sensitive approach for identifying metastatic illness. Minimal access surgery has been recommended in Oncologic practice with insignificant data demonstrating its efficacy. Diagnostic laparoscopy is more successful in establishing a diagnosis, can be therapeutic, and has less morbidity and mortality than a traditional laparotomy. The results of a diagnostic laparoscopy may alter the course of treatment. Laparoscopy is a surgical technique as much as an exploratory laparotomy, and it can be just as enlightening to the skilled eye. The exploratory laparoscopic incision allows the surgeon a better view of the whole peritoneal cavity than the typical exploratory incision does. Producing a high rate of positive diagnosis with laparoscopy requires a good foundation in surgery, great clinical acumen, knowledge and awareness of abdominal pathology, and other related factors.^{1,2-5} The rebirth of interest in laparoscopy has

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How to cite this article: Mishra B, Nayak J, Dalai P, *et al.* Evaluation of Effectiveness of Diagnostic Laparoscopy in Staging of Gastrointestinal and Hepatobiliary Malignancies: A Retrospective Study from a Tertiary Care Center. *World J Lap Surg* 2023;16(2):71-74.

Source of support: Nil

Conflict of interest: None

made it possible for considerable breakthroughs to be achieved in the identification and staging of cancer, which is one of the most important and significant developments. The diagnosis of tumors that are found within the abdomen is increasingly being done using laparoscopy. In many cases of abdominal cancer, laparoscopy can avoid unneeded examination. This innovative approach may identify general metastases or secondary nodules in the liver, peritoneum, or adenopathy, eliminating the need

for additional surgeries and saving the patient a very lengthy convalescence.^{6,7}

The study's goals were to determine the significance of diagnostic laparoscopy in staging abdominal cancer and to evaluate the feasibility of avoiding needless laparotomies.

MATERIALS AND METHODS

We conducted a retrospective review of the medical records of all patients admitted to the Department of General Surgery, SCB Medical college and Hospital, Odisha, India from 2011 to 2021.

Patients with abdominal malignancy were admitted to the Surgery Department, where the following procedures were performed: history taking, clinical examination, routine examination, and specific investigations. Following the preliminary they were treated to Laparoscopy for evaluation.

Inclusion Criteria

- Patients of both sexes
- Age > 18 years
- Histologically verified, clinically and radiologically suspected cancers necessitating surgery (laparotomy)

Exclusion Criteria

- Non-resectability on computed tomography (CT) scan
- Patient has uterine, ovarian, or cervix carcinoma
- Patient is unsuitable for general anesthesia

A thorough history of the patients was collected.

Reviewing the patient's medical records allowed us to learn such things as the person's age, gender, employment status, admission and release dates, surgery and clinical investigation dates. The patient had diagnostic laparoscopy, and the results were documented. Staging laparoscopy patients received further treatment based on the findings of the operation. Patients were tracked for the presence of any known problems, hospitalization, or costs related to hospitalization.

A complete examination was performed on every patient with a history of abdominal cancer, and the results were documented. Patients with a history of abdominal cancer had a full battery of diagnostic tests, including a local and systemic evaluation. Inspection, palpation, percussion, and auscultation were all performed on each person. Patients who were suspected of having abdominal cancer underwent a battery of diagnostic tests, including chest X-rays, erect abdominal X-rays, ultrasounds of the abdomen and pelvis, CT scans, and, if necessary, upper and lower gastrointestinal endoscopies, in addition to hematological analysis.

Laparoscopy: Following a thorough workup and investigations, a clinical diagnosis was established, radiological assistance was sought when possible, and patients were evaluated for diagnostic laparoscopy.

All patients were advised of the operation's risks and advantages, as well as the possibility of a laparotomy if necessary and the ultimate surgery if necessary. A 10 mm telescope was placed into the supra/sub umbilical port after creating a pneumoperitoneum with a verses needle or by introducing a blind trocar. In order to manipulate or biopsy intraabdominal illnesses, a second 5 mm port was placed in the upper or lower abdomen. The patient had a full

Table 1: Age and sex distribution

Age in years	Male	Female	Total	Percentage (%)
21-30	1	2	3	10
31-40	1	2	3	10
41-50	2	5	7	23.3
51-60	5	1	6	20
61-70	4	7	11	36.7
Total	13	17	30	100

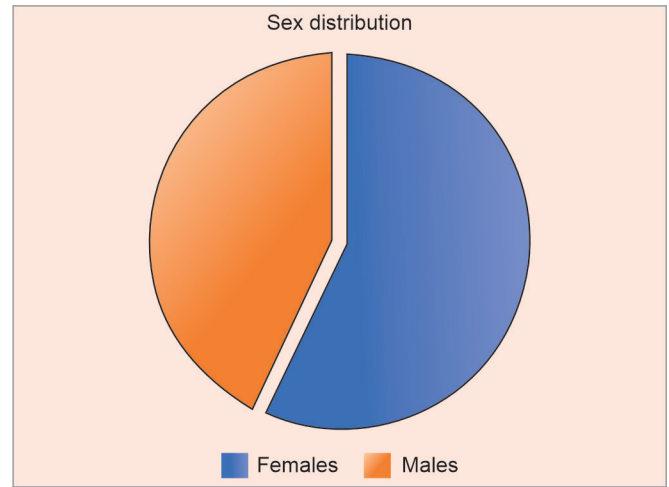


Fig. 1: Illustration of sex distribution

abdominal examination, with biopsies taken as necessary. After that, laparoscopic therapeutic therapy was undertaken whenever feasible, along with thorough staging. When no more action was required, no further steps were taken. From the moment the first trocar is inserted until the completion of the staging phase is the operational time. From the day of surgery to the day of discharge or death, it was the recovery time. Wound sepsis (infection at the surgical site), respiratory distress, and other forms of morbidity were measured both during and after surgery. Death rates were also documented.

RESULTS

The study group included 30 patients (13 men (43%) and 17 females (57%) (Table 1 and Fig. 1) shows 15 instances of stomach tumors (50%), 13 cases of colorectal tumors (43.3%), and 2 cases of biliary tract tumors (6.7%) (Fig. 2).

Laparoscopy could achieve correct staging in 29 patients (96.7%), implying that the sensitivity of staging laparoscopy is 0.97 and the specificity of the test is 1. In 13 patients (43.3%), unnecessary and futile laparotomies were averted. Only one patient (3.3%) required laparotomy when staging laparoscopy revealed that the tumor was unresectable. The mean time of staging laparoscopy in the resectable group was 17.35 minutes, which was less than the mean duration in the unresectable group of 20.76 minutes. Only 5 (16.7%) experienced problems, of which 3(10%) had operational wound sepsis and 2 (6.7%) had significant complications (major respiratory complication) (Fig. 3).

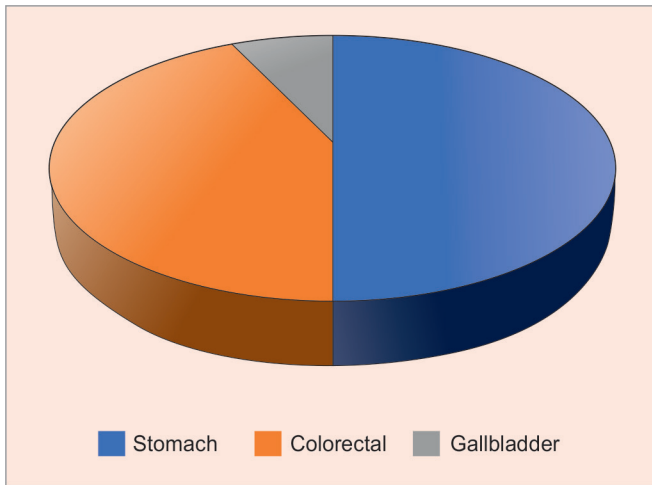


Fig. 2: Illustration of tumor site

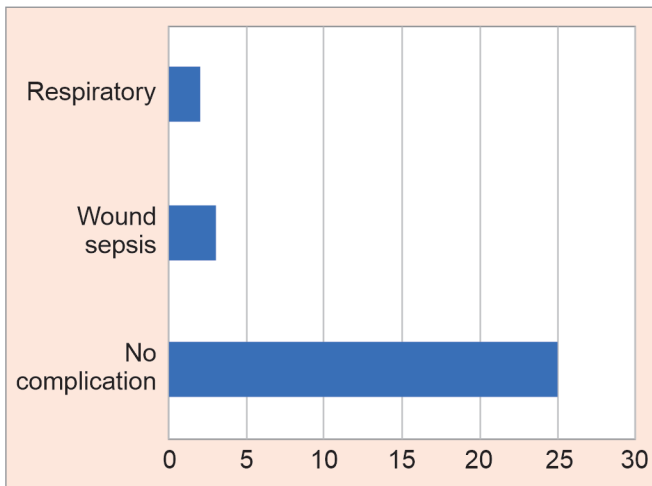


Fig. 3: Distribution based on number of complications

Laparoscopy staging was related with lower morbidity and discomfort, faster recovery, and earlier beginning of adjuvant treatments.

DISCUSSION

Over the last decade, laparoscopy has surpassed open laparotomy as the preferred technique in patients requiring surgical diagnosis and treatment.

Cancer Staging

For those in need of a tissue diagnosis is needed to direct treatment but cannot be obtained by image-guided needle biopsy or endoscopic techniques, laparoscopy is used as a biopsy method. Using laparoscopy, a surgeon may diagnose patients with obscure abdominal complaints, track their health over time, and identify them.^{8,9} Laparoscopy for staging has become an essential method for determining whether or not a patient with a gastrointestinal malignancy is a candidate for a potentially curative resection.¹⁰⁻¹⁶ The magnified view provided by a laparoscope allows the surgeon to detect metastases in the liver or peritoneum that would otherwise be undetectable with noninvasive imaging

methods. Laparoscopic ultrasonography has the potential to imaging hidden liver metastases or the invasiveness of a local tumor, both of which would prohibit a curative resection. It has been projected that 20% of patients having staging laparoscopy for mixed upper gastrointestinal cancers would have occult metastases that were not detected on preoperative imaging.^{10,17} Laparoscopy improved preoperative staging accuracy in a single cohort of 389 patients. In 41% of patients, including several who initially had benign lesions identified on preoperative imaging.¹⁰ Hepatocellular carcinoma, gallbladder carcinoma, extrahepatic bile duct cancer, and certain periampullary cancers can all benefit from laparoscopic staging, as can lymphoma, esophageal cancer, gastric cancer, pancreatic adenocarcinoma, and other cancers of the digestive tract.^{10,18-22} Most concealed metastases may be found with a simple laparoscopy and biopsy, but adding laparoscopic ultrasonography to the staging process might help find disease elsewhere, especially vascular invasion, which would also exclude removal. Diagnostic laparoscopy and laparoscopic ultrasonography imaging, a combination of diagnostic laparoscopy and laparoscopic ultrasonography, provides more precise staging and resectability information than preoperative imaging investigations for patients with primary or metastatic intraabdominal neoplasms, according to some authors.²³ Patients benefit in two ways with staging laparoscopy (SL)—it helps determine who needs neoadjuvant therapy for locally advanced disease and spares patients from exploratory laparotomies. Siewert makes an unambiguous claim. In particular, peritoneal carcinomatosis benefits from the improved preoperative staging made possible by surgical laparoscopy. Neoadjuvant chemotherapy is an example of a treatment that should be used if it may help patients. Otherwise, the benefits and risks need to be balanced accurately. Both the doctor and the patient might suffer from irresponsible laparoscopic surgery.²⁴ Critical technical components of are identified by Rosin et al. treatment-planning laparoscopy. The first point of contention is when it should be performed—either as a stand-alone therapy or just before the anticipated therapeutic operation. It's also debatable whether or not to do a full dissection with LUS and a peritoneal cytology sample, or whether or not to only examine with biopsy of suspicious lesions.²⁵ Oñate-Ocaña et al. describe a four-group staging system.²⁶ Disease progression from stage I (no serosal involvement) to stage II (serosal involvement) to stage III (invasion of surrounding organ) to stage IV (remote sickness). The proposed staging system is supposed to be a more straightforward alternative to TNM staging. It may be used to determine the best course of treatment for an individual patient and to stratify risk factors in advance of future randomized clinical trials.²⁶⁻²⁸

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REFERENCES

1. Udhwadia TE. Diagnostic Laparoscopy, a textbook of Laparoscopic surgery in developing countries, 1st edition. New Delhi: Jaypee Brothers; 1997: pp. 15-43.
2. Boujer HJ, Hazebroek EJ, Kazemier G, et al. Open versus closed establishment of pneumoperitoneum in laparoscopic surgery. Br J Surg 1997;84:599-602. PMID: 9171741.

3. Bemelman WA, De Wit LT, Busch OR, et al. Establishment of pneumoperitoneum with a modified blunt trocar. *J Laparoendosc Adv Surg Tech A* 2000;10(4):217–218. DOI: 10.1089/109264200421612.
4. Boyd Jr WP, Nord HJ. Diagnostic laparoscopy. *Endoscopy* 2000;32(2):153–158. DOI: 10.1055/s-2000-89.
5. Cosgrove J, Korman J, Chen M, et al. Laparoscopy for the acute abdomen. *Semin Laparosc Surg* 1996;3(3):131–134. DOI: 10.1177/155335069600300303.
6. Sozuer EM, Bedirli A, Ulusal M, et al. Laparoscopy for diagnosis and treatment of acute abdominal pain. *J Laparoendosc Adv Surg Tech A* 2000;10(4):203–207. DOI: 10.1089/109264200421586.
7. Coupland G, Townsend D, Martin C. Peritoneoscopy – Use in assessment of intra-abdominal malignancy. *Surgery* 1981;89:645–649. PMID: 6454269.
8. Mansi C, Savarino V, Picciotta A, et al. Comparison between laparoscopy, ultrasonography and computed tomography in widespread and localized liver disease. *Gastrointest Endosc* 1982;28(2):83–85. DOI: 10.1016/s0016-5107(82)73005-6.
9. Gandolfi L, Rossi A, Leo P, et al. Indications for laparoscopy before and after the introduction of ultrasonography. *Gastrointest Endosc* 1985;31(1):1–3. DOI: 10.1016/s0016-5107(85)71953-0.
10. Hünerbein M, Rau B, Hohenberger P, et al. The role of staging laparoscopy for multimodal therapy of gastrointestinal cancer. *Surg Endosc* 1998;12(7):921–925. DOI: 10.1007/s004649900747.
11. Lehnert T, Rudek B, Kienle P, et al. Impact of diagnostic laparoscopy on the management of gastric cancer: Prospective study of 120 consecutive patients with primary gastric adenocarcinoma. *Br J Surg* 2002;89(4):471–475. DOI: 10.1046/j.0007-1323.2002.02067.x.
12. Muntean V, Oniu T, Lungoci C, et al. Staging laparoscopy in digestive cancers. *J Gastrointestinal Liver Dis* 2009;18(4):461–467. PMID: 19565050.
13. Cuschieri A. Role of video-laparoscopy in the staging of intra-abdominal lymphomas and gastrointestinal cancer. *Semin Surg Oncol* 2001;20(2):167–172. DOI: 10.1002/ssu.1029.
14. Ozmen MM, Zulfikaroglu B, Ozalp N, et al. Staging laparoscopy for gastric cancer. *Surg Laparosc Endosc Percutan Tech* 2003;13(4):241–244. DOI: 10.1097/00129689-200308000-00003.
15. Hemming AW, Nagy AG, Scudamore CH, et al. Laparoscopic staging of intraabdominal malignancy. *Surg Endosc* 1995;9:325–328. DOI: <https://doi.org/10.1007/BF00187778>.
16. Asencio F, Aguiló J, Salvador JL, et al. Laparoscopic staging of gastric cancer A prospective multicenter comparison with noninvasive techniques. *Surg Endosc* 1997;11(12):1153–1158. DOI: <https://doi.org/10.1007/s004649900559>.
17. Van Dijkum EJ, de Wit LT, van Delden OM, et al. Staging laparoscopy and laparoscopic ultrasonography in more than 400 patients with upper gastrointestinal cancer. *J Am Coll Surg* 1999;189(5):459–465. DOI: 10.1016/s1072-7515(99)00186-6.
18. Jarnagin WR, Conlon K, Bodniewicz J, et al. A clinical scoring system predicts the yield of diagnostic laparoscopy in patients with potentially resectable hepatic colorectal metastases. *Cancer* 2001;91(6):1121–1128. DOI: 10.1002/1097-0142(20010315)91:6<1121::aid-cncr1108>3.0.co;2-2.
19. Bogen GL, Manino AT, Scott-Conner C. Laparoscopy for staging and palliation of gastrointestinal malignancy. *Surgical Clinics of North America* 1996;76(3):557–569. DOI: [https://doi.org/10.1016/S0039-6109\(05\)70462-X](https://doi.org/10.1016/S0039-6109(05)70462-X).
20. Andrén-Sandberg A1, Lindberg CG, Lundstedt C, et al. Computed tomography and laparoscopy in the assessment of the patient with pancreatic cancer. *J Am Coll Surg* 1998;186(1):35–40. DOI: 10.1016/s1072-7515(97)00128-2.
21. Warshaw AL, Tepper JE, Shipley WU. Laparoscopy in the staging and planning of therapy for pancreatic cancer. *Am J Surg* 1986;151(1):76–80. DOI: 10.1016/0002-9610(86)90015-2.
22. Cuschieri A. Laparoscopy for pancreatic cancer: Does it benefit the patient? *Eur J Surg Oncol* 1988;14(1):41–44. PMID: 2964382.
23. Tsioulis GJ, Wood TF, Chung MH, et al. Diagnostic laparoscopy and laparoscopic ultrasonography optimize the staging and resectability of intraabdominal neoplasms. *Surg Endosc* 2001;15(9):1016–1019. DOI: 10.1007/s004640080094.
24. Siewert JR. Invited Commentary. *World J Surg* 2000;24:1135. DOI: 10.1097/00000658-200009000-00007.
25. Rosin D, Brascesco O, Rosenthal RJ. Laparoscopy for gastric tumors. *Surg Oncol Clin N Am* 2001;10(3):511–529. PMID: 11685925.
26. Oñate-Ocaña LF, Gallardo-Rincón D, Aiello-Crocifoglio V, et al. The role of pretherapeutic laparoscopy in the selection of treatment for patients with gastric adenocarcinoma: A proposal for a laparoscopic staging system. *Ann Surg Oncol* 2001;8(8):624–631. DOI: 10.1007/s10434-001-0624-1.
27. Mansfield PF. Laparoscopic staging for gastric cancer. *Ann Surg Oncol* 2001;8(8):622–623. DOI: 10.1007/s10434-001-0622-3.
28. Burke EC, Karpeh MS, Conlon KC, et al. Laparoscopy in the management of gastric adenocarcinoma. *Ann Surg* 1997;225:262–267. PMC: 1190675.