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An Observational Evaluation of Diagnostic Laparoscopy in the Preoperative Staging of Gastrointestinal Cancers to Prevent Unnecessary Laparotomies

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ABSTRACT :

****Abstract****

****Background**:** Gastrointestinal cancers are among the most common and difficult to manage worldwide. For effective treatment planning, especially surgical intervention, precise staging is crucial. Diagnostic laparoscopy (DL) has become a valuable minimally invasive method to improve staging accuracy, particularly when imaging findings are inconclusive. DL allows direct examination of intra-abdominal structures, enabling better assessment of tumor operability and helping avoid non-beneficial laparotomies, thus lowering surgical complications and recovery burdens.

****Methods**:** This prospective observational study was conducted at ASRAM Medical College between July 2022 and January 2024. A total of 30 patients with confirmed or suspected gastrointestinal cancers were enrolled. DL was performed to evaluate tumor spread, aiming primarily to identify non-resectable disease and avoid unnecessary open surgeries. Data on patient characteristics, tumor behavior, surgical outcomes, and cost efficiency were analyzed.

****Results**:** DL changed the surgical plan in 36% of cases by revealing inoperable disease missed on imaging. Eleven patients avoided unneeded laparotomy, leading to shorter hospital stays, fewer complications, and reduced treatment costs.

****Conclusion**:** DL is a reliable and safe tool for preoperative staging in gastrointestinal cancers. It effectively reduces the rate of non-therapeutic laparotomies, improves clinical outcomes, and is a cost-efficient staging approach. Incorporating DL into standard pre-surgical assessment, especially in ambiguous cases, is strongly advocated.

Introduction

Gastrointestinal (GI) cancers, including those of the stomach, pancreas, liver, and colon, continue to pose a significant global health concern. Despite advancements in radiological imaging, a notable percentage of patients undergo avoidable laparotomies that ultimately reveal inoperable disease. These unnecessary procedures contribute to elevated healthcare costs and patient morbidity.

Traditional open exploratory surgeries carry substantial risk, particularly when no therapeutic benefit is ultimately achieved. Diagnostic laparoscopy (DL), a less invasive technique, enables detailed inspection of abdominal structur.es with minimal trauma. By improving detection of advanced or metastatic disease not identified on imaging, DL reduces the incidence of ineffective open surgeries. This study aims to assess DL's effectiveness as a staging modality in gastrointestinal cancers, focusing on its impact on clinical decision-making and patient outcomes.

Aims and Objectives

Primary Aim: To examine the role of diagnostic laparoscopy as a preoperative staging modality in patients with GI malignancies to avoid unnecessary laparotomies.

Specific Objectives:
- To evaluate DL's ability to detect unresectable or advanced malignancies.
- To determine DL's effectiveness in reducing non-therapeutic laparotomies.

Materials and Methods

Study Design: A prospective observational study conducted from July 2022 to January 2024 at ASRAM Medical College, involving 30 patients with suspected or confirmed gastrointestinal malignancies.

Inclusion Criteria:
- Patients aged 18 or above with suspected or proven GI cancers.
- Patients considered for curative surgical resection.

Exclusion Criteria:
- Patients with advanced disease apparent on imaging.
- Patients with gynecological malignancies.
- Individuals unfit for anesthesia or laparoscopy.

Surgical Procedure: Diagnostic laparoscopy was carried out under general anesthesia, using standard port placements to enable complete visualization of peritoneal surfaces, liver, and other organs. Peritoneal lavage cytology and liver biopsy were done when needed.

Data Collection: Patient demographics, tumor type, intraoperative findings, and postoperative recovery were recorded and analyzed.

Statistical Analysis: Descriptive statistics summarized key variables including patient characteristics, operative findings, and outcomes.

Observations and Results

Table 1: Distribution of Tumor Types
Out of the 30 patients (13 males, 17 females), the mean age was approximately 50 years, with a majority in the 41–50 age range. Presenting complaints included weight loss (43%), pain abdomen (37%), gastrointestinal bleeding (20%), and jaundice (27%). Despite preoperative imaging, diagnostic uncertainty remained in 40% of the patients.

Tumor Distribution:
- Stomach: 10 cases (33%)
- Pancreas: 8 cases (27%)
- Colorectal: 6 cases (20%)
- Hepatobiliary: 4 cases (13%)
- Others: 2 cases (7%)

Laparoscopic Findings:
DL identified 11 patients (36%) with unresectable disease, mainly due to peritoneal carcinomatosis or superficial liver metastasis. This avoided unnecessary laparotomies. The remaining 19 patients (64%) proceeded with curative surgeries such as gastrectomy, Whipple's procedure, or extended cholecystectomy.

Table 2: Causes of Unresectability
Causes of Unresectability:
- Superficial liver metastases with locally invasive tumors: 6 cases (55%)
- Peritoneal carcinomatosis: 5 cases (45%)

Discussion

This study confirms DL's utility in altering treatment plans by accurately identifying patients with unresectable disease. In 36% of cases, DL spared patients the risk and recovery associated with a futile laparotomy. These results align with previous research supporting the use of DL in the staging of GI malignancies.

By reducing unnecessary surgeries, DL contributes to better postoperative outcomes, including quicker recovery, fewer complications, and shorter hospitalizations. DL also plays a role in economic savings by avoiding extended hospital stays and intensive post-surgical care.

While the sample size is limited, the findings strongly advocate integrating DL into the standard staging protocol, particularly for ambiguous or

borderline operable cases.

Limitations

The study's conclusions are limited by a relatively small sample size. Additionally, advanced imaging techniques like PET-CT were not routinely used, which could complement DL findings. Future studies should explore the integration of DL with neoadjuvant therapy and laparoscopic ultrasound for enhanced staging accuracy.

Conclusion

Diagnostic laparoscopy is a valuable addition to preoperative assessment in GI malignancies. By minimizing unnecessary open surgeries and guiding more effective treatment decisions, DL enhances patient outcomes while reducing treatment-related costs. Its routine use is recommended, especially when radiological findings do not offer conclusive guidance.

Tumor Type	No. of Cases	Percentage
Stomach	10	33%
Pancreas	8	27%
Colorectal	6	20%
Hepatobiliary	4	13%
Others	2	7%
Cause of Unresectability	Number of Cases	
Superficial liver metastases with locally invasive tumors	6	
Peritoneal carcinomatosis	5	

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