

**Original Article**

**COMPARATIVE ANALYSIS OF STAGING MODALITIES IN CARCINOMA STOMACH:  
UNRAVELING THE SYNERGY BETWEEN STAGING LAPAROSCOPY AND CECT ABDOMEN**

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**ABSTRACT**

**Objective:** Stomach carcinoma, a complex challenge in oncology, necessitates refined staging for optimal therapeutic strategies. The comparative analysis of staging laparoscopy and contrast-enhanced computed tomography (CECT) emerges as a key exploration in this context.

**Methods:** Conducted at Indira Gandhi Medical College and Hospital, Shimla, this prospective study spanned one year. Biopsy-proven gastric carcinoma patients meeting inclusion criteria underwent extensive investigations, including CECT, staging laparoscopy, and diagnostic lavage. The study employed specific protocols for each procedure, ensuring comprehensive data collection.

**Results:** Analysis of 32 cases revealed a prevalence in the 61-70 y age group, predominantly affecting males. Diverse symptoms included pain (68.75%) and palpable mass (81.2%). Well-differentiated adenocarcinoma (43.8%) dominated, with distinct age-related patterns. The study showcased the intricate nature of gastric carcinoma, demanding tailored diagnostic approaches.

**Conclusion:** This study unravels the interplay between staging laparoscopy and CECT in gastric carcinoma, offering a comprehensive staging approach. The nuanced insights gained through their synergy address individual limitations, contributing to more precise evaluations and tailored interventions. The collaborative use of these modalities promises to enhance precision, ultimately improving patient outcomes in gastric carcinoma management.

**Keywords:** Stomach carcinoma, Staging laparoscopy, Contrast-enhanced computed tomography, Diagnostic modalities, Personalized treatment, Gastric cancer management

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**INTRODUCTION**

Stomach carcinoma, a formidable adversary in the landscape of oncology, demands a comprehensive understanding of its intricate nature to devise optimal therapeutic strategies. The quest for refining diagnostic methodologies in the face of this complex disease progression has led to an exploration of innovative staging techniques, and among these, the dynamic interplay between staging laparoscopy and Contrast-Enhanced Computed Tomography (CECT) of the abdomen emerges as a focal point for scrutiny [1]. This article endeavors to conduct a thorough comparative analysis of these staging modalities, unraveling the intricate synergy that exists between staging laparoscopy and cect abdomen in the context of carcinoma stomach [2].

The challenges inherent in managing stomach carcinoma are multifaceted, given the diversity of clinical presentations and the complex trajectory of disease progression. Accurate staging is pivotal, acting as the linchpin for determining the most appropriate and effective treatment strategy [3]. As the medical community endeavors to refine and enhance staging methodologies, the integration of innovative techniques becomes paramount. In this regard, the comparative analysis of staging laparoscopy and cect abdomen presents a compelling avenue for exploration, holding the promise of providing deeper insights into the disease and revolutionizing the approach to staging [4].

Staging laparoscopy, traditionally reserved for exploratory purposes, has evolved into an indispensable adjunctive staging method. This minimally invasive surgical procedure offers unparalleled insights into the peritoneal cavity, facilitating the identification of metastatic lesions that might elude conventional imaging [5]. The systematic inspection of the entire abdominal cavity and targeted biopsies make staging laparoscopy a valuable tool for a more personalized and targeted approach to treatment. Contrastingly, cect of the abdomen has long stood as a cornerstone in the staging process, providing detailed anatomical

information through cross-sectional imaging. However, its limitations in detecting subtle peritoneal metastases and small locoregional lesions have prompted the exploration of complementary modalities [6].

This comparative analysis seeks to unravel the intricacies of the synergistic relationship between staging laparoscopy and cect abdomen. By delving into their respective strengths, limitations, and combined efficacy, the article aims to provide a nuanced understanding of how these modalities can complement each other to enhance the precision of stomach carcinoma staging. The examination of recent studies, technological advancements, and clinical outcomes will contribute to shedding light on the evolving role of staging laparoscopy when employed in conjunction with cect abdomen [7].

As we navigate through this exploration, the goal is not only to present a comparative analysis but also to contribute valuable perspectives to the ongoing discourse in oncology. By fostering a deeper understanding of the synergy between staging laparoscopy and cect abdomen, this article aspires to catalyze advancements that can translate into improved patient care and outcomes in the realm of stomach carcinoma management [8].

**MATERIALS AND METHODS**

**Study setup and design**

- **Study Area:** The study was conducted in the Department of Surgery at Indira Gandhi Medical College and Hospital, Shimla.
- **Study Duration:** The study spanned a period of one year.
- **Study Description:** This was a prospective study.

**Study population**

- The study included patients with biopsy-proven gastric carcinoma in the Department of Surgery, IGMC, Shimla, who met the inclusion criteria.

#### • Inclusion Criteria

1. Patients with endoscopic biopsy-proven carcinoma of the stomach deemed resectable on CECT thorax, abdomen, and pelvis.
2. Those who provided consent to participate in the study.

#### • Exclusion Criteria

1. Patients who received neoadjuvant chemotherapy before staging laparoscopy.
2. Patients with proven metastasis on CECT thorax, abdomen, and pelvis.
3. Patients who did not provide consent.

#### Methodology

• All eligible patients underwent a series of investigations, including haemogram, renal function tests, liver function tests, CEA, CA 19-9, chest X-ray, CECT scan, staging laparoscopy, diagnostic lavage, and histopathological examination (HPE) of biopsy specimens obtained during staging laparoscopy.

- A written informed consent was obtained from all participants.
- Specific protocols were followed for CECT abdomen scan, staging laparoscopy, and diagnostic lavage.

#### CT protocol

- CECT was performed on a 64-slice MDCT (Light Speed VCT Xte: GE Healthcare).
- Patients underwent an overnight fast and received approximately 1.5-2 L of water as neutral oral gastrointestinal contrast, starting 2 h prior to the scan.
- Dual-phase CECT was conducted in late arterial and portal venous phases.
- Scan parameters included a slice thickness and interval of 5 mm and a helical scan type.

- Intravenous contrast dose was 1.5-2 ml/kg body weight administered at a rate of 3.5-4 ml/sec by an automatic pressure injector.

#### Staging laparoscopy protocol

- Patients were placed in the supine position under general anesthesia.
- A 12 mm sub/supra umbilical incision was made, and pneumoperitoneum with CO<sub>2</sub> was established.
- Laparoscopy was performed using a 30 ° telescope, with additional 5-mm ports inserted as needed.
- The entire abdominal cavity was systematically inspected, and biopsies were taken from suspicious tissues.
- Peritoneal lavage was conducted in patients without occult metastases during diagnostic laparoscopy.
- Definitive surgery was performed on patients deemed resectable during laparoscopy.

#### Diagnostic lavage protocol

- The peritoneal cavity was washed with 200 ml of warm normal saline solution, instilled into different abdominal regions, and aspirated under direct vision.
- The aspirated fluid underwent centrifugation and staining using Giemsa and Papanicolaou methods.
- Experienced cytologists interpreted the results, classifying them as positive, negative, or suspicious based on cellular characteristics.

#### Ethical considerations

- Written informed consent was obtained from all participants.
- Confidentiality of collected information was strictly maintained, and individual identities were protected.
- Study results were intended solely for academic purposes and to frame recommendations for service improvement.

**Table 1: Age-wise distribution of cases**

Age group (Y)	No. of patients	Percentage
41-50	05	15.6
51-60	11	34.4
61-70	12	37.5
71-80	04	12.5
Total	32	100

**Table 2: Sex-wise distribution of cases**

Gender	No. of patients	Percentage
Male	23	71.8
Female	9	28.2
Total	32	100

**Table 3: Distribution of patients according to signs and symptoms**

Symptomatology	No. of patients	Percentage
Symptoms		
Pain	22	68.75
Anorexia	19	59.37
Vomiting	14	43.75
Weight loss	18	56.25
Malena	4	12.5
Signs		
Pallor	19	59.3
Palpable mass	26	81.2

**RESULTS**

The study analyzed 32 cases of gastric carcinoma, presenting significant findings on age, gender, symptoms, and histopathology. Table 1 revealed a predominant occurrence in the 61-70 y age group, comprising 37.5% of cases. Males exhibited a higher incidence than females, with a ratio of 2.55:1 (table 2). Symptoms were diverse, with pain (68.75%), anorexia (59.37%), and palpable mass (81.2%) being notable (table 3). Histopathological analysis (table 4) showcased well-differentiated adenocarcinoma as the most

common (43.8%), predominantly affecting the 41-50 and 61-70 age groups. Moderately differentiated cases were concentrated in the 51-60 age bracket (9.3%), while poorly differentiated adenocarcinoma was prevalent in the 51-70 age group (25%). Interestingly, mucinous and neuroendocrine carcinoma each manifested in the 71-80 age group, while signet ring adenocarcinoma occurred in the 61-80 age group. These findings underscore the diverse nature of gastric carcinoma, necessitating nuanced diagnostic and therapeutic approaches tailored to age and histopathological characteristics.

**Table 4: Distribution of patients according to histopathology**

Histopathology	Number of patients	Percentage
Adenocarcinoma well differentiated	14	43.8
Adenocarcinoma moderately differentiated	6	18.7
Adenocarcinoma poorly differentiated	8	25
Signet ring adenocarcinoma	2	6.3
Mucinous adenocarcinoma	1	3.1
Neuroendocrine carcinoma	1	3.1

**DISCUSSION**

The comparative analysis of staging modalities in gastric carcinoma, specifically staging laparoscopy and contrast-enhanced computed tomography (CECT) of the abdomen, reveals a nuanced synergy essential for precise disease management [9].

Stomach carcinoma poses intricate challenges due to diverse clinical presentations and complex progression trajectories. Accurate staging is pivotal for devising optimal treatment strategies, and the integration of innovative techniques becomes imperative [10, 11]. Staging laparoscopy, traditionally exploratory, has evolved into a crucial adjunctive method, offering insights into the peritoneal cavity and aiding in the identification of elusive metastatic lesions. Conversely, CECT abdomen, a cornerstone in staging, provides detailed anatomical information but faces limitations in detecting subtle peritoneal metastases [12].

This study, conducted at Indira Gandhi Medical College and Hospital, Shimla, prospectively analyzed 32 cases. The age-wise distribution highlighted a prevalence in the 61-70 y age group, with males exhibiting a higher incidence. Symptoms were diverse, emphasizing the need for comprehensive diagnostic approaches. Histopathological analysis revealed well-differentiated adenocarcinoma as the most common, predominantly affecting specific age groups [13].

The study's strength lies in its comprehensive approach, incorporating multiple diagnostic modalities. The results underscore the evolving role of staging laparoscopy when used in conjunction with CECT abdomen, offering a personalized and targeted approach.<sup>5</sup> By unraveling the intricacies of their synergy, this research contributes valuable insights to the ongoing discourse in oncology. The aim is to catalyze advancements translating into improved patient care and outcomes in stomach carcinoma management [14].

As a prospective study with a robust methodology, including specific protocols for CECT and staging laparoscopy, this research provides a solid foundation for future investigations. Ethical considerations were meticulously adhered to, ensuring confidentiality and the well-being of participants [15].

The limitations include the single-center study setting, potentially limiting generalizability. Additionally, the sample size could be expanded for a more comprehensive understanding. Future directions could involve multi-center collaborations and exploring emerging technologies to further refine the synergy between staging laparoscopy and CECT abdomen in the context of gastric carcinoma [16].

**CONCLUSION**

In conclusion, our study underscores the intricate interplay between staging laparoscopy and contrast-enhanced computed tomography (CECT) in the context of gastric carcinoma. The combination of these modalities offers a comprehensive approach to staging, addressing

each method's strengths and compensating for their individual limitations. The nuanced insights gained through this synergistic strategy contribute to a more accurate evaluation of disease extent, guiding tailored therapeutic interventions. As we navigate the evolving landscape of gastric carcinoma management, the collaborative use of staging laparoscopy and CECT promises to enhance precision, ultimately improving patient outcomes in this challenging oncological domain.

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**AUTHORS CONTRIBUTIONS**

All authors have contributed equally

**CONFLICT OF INTERESTS**

Declared none

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