ORIGINAL RESEARCH

Enhancing Diagnostic Accuracy for Gastric Cancer: Integration of Multi-Slice Spiral CT and Gastrointestinal Angiography

Kai Wang, MM; Dongqiang Guo, MM; Huibin Yan, MM; Zhifeng Wu, MM; Liangliang Xue, MM

ABSTRACT

Objective • This study aimed to assess the clinical efficacy of combining multi-slice spiral CT with gastrointestinal angiography for diagnosing gastric cancer.

Methods • We conducted a retrospective analysis of clinical data from 151 patients with suspected gastric cancer admitted to our hospital between January 2014 and January 2022. Among them, 70 patients underwent multi-slice spiral CT alone (control group), while the remaining 81 patients underwent multi-slice spiral CT in combination with gastrointestinal barium contrast (combination group). Finally, pathological examination confirmed gastric cancer in 81 patients. We analyzed the diagnostic efficacy of multi-slice spiral CT combined with gastrointestinal angiography for staging gastric cancer and detecting lymph node metastasis.

Results • The sensitivity and accuracy of diagnosing gastric cancer using multi-slice spiral CT combined with gastrointestinal angiography were significantly superior to CT alone ($P < .05$). This combined approach exhibited substantial advancements in detecting stage I and II tumors compared to a single CT, although the difference in stage III detection rate was marginal ($P < .05$). Furthermore, among the 81 gastric cancer cases, 67 were confirmed to have lymph node metastasis through surgical and pathological examination. The lymph node detection rate with multi-slice spiral CT combined with gastrointestinal angiography was significantly higher than that achieved with single CT ($P < .05$).

Conclusions • Combining multi-slice spiral CT with gastrointestinal angiography proved to be an effective diagnostic strategy for gastric cancer. (*Altern Ther Health Med.* 2024;30(2):118-123).

Kai Wang, MM; Dongqiang Guo, MM; Huibin Yan, MM; Zhifeng Wu, MM; Liangliang Xue, MM; Department of Radiology,Shanxi Bethune Hospital, Shanxi Academy of Medical Sciences, Tongji Shanxi Hospital, Third Hospital of Shanxi Medical University, Taiyuan, China; Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China.

Corresponding author: Liangliang Xue, MM
E-mail: xueliangliang2008@163.com

INTRODUCTION

Gastric cancer, commonly known as stomach cancer, represents a significant global health concern due to its high incidence and substantial impact on morbidity and mortality.[1] This malignancy arises from the uncontrolled growth of cells in the stomach's lining, often originating in the gastric mucosal epithelial tissue. Gastric cancer's etiology is multifactorial, with various risk factors, including Helicobacter pylori infection, precancerous lesions, genetic susceptibility, and environmental and dietary influences.[2]

Gastric cancer is the second leading cause of cancer-related deaths worldwide, with a particularly pronounced prevalence in certain regions, including China, where its incidence continues to rise. Understanding the pathogenesis, risk factors, diagnostic methods, and treatment strategies for gastric cancer is important in preventing this challenging disease.[1,2]

Currently, the primary treatment modality for gastric cancer is surgical intervention. Notably, the 5-year survival rate following surgery for early-stage cases exceeds an impressive 90%, whereas for advanced-stage cases, it reduces to less than 30%.[2] This marked disparity in survival rates can be attributed to the stomach's unique anatomical structure and the absence of distinctive symptoms during the initial stages of the disease.[2,3] As gastric cancer progresses, patients may begin to experience symptoms such as epigastric pain, anemia, loss of appetite, and eventually, more severe manifestations like hematemesis (vomiting blood) and melena (black stools).[3,4]

Early detection of gastric cancer plays a pivotal role in improving patient outcomes. Therefore, the early detection of gastric cancer in clinical settings holds utmost significance. It serves as a critical reference point for developing optimal

treatment strategies and plays a critical role in enhancing the overall prognosis for afflicted patients.

Various clinical methods are available for diagnosing gastric cancer, with common approaches encompassing fiberoptic gastroscopy, spiral CT examinations, and upper gastrointestinal angiography.[5] The gold standard for diagnosing this condition remains histopathological biopsy performed under fiberoptic gastroscopy. However, it is important to note that this procedure has certain limitations, as it can cause discomfort and trauma to patients during the diagnostic process.[6] On the other hand, upper gastrointestinal angiography offers distinct advantages in providing a clear visualization of critical aspects, including the tumor's location, size, alterations in mucosal folds, the presence of cancerous gastric ulcers, and gastric wall peristalsis, among other diagnostic features.[6,7]

However, upper gastrointestinal angiography possesses certain limitations as it primarily serves to diagnose lesions within the gastric cavity. It lacks the precision required to accurately assess the extent of tumor infiltration into the gastric wall or the presence of cancer cell metastasis to abdominal lymph nodes and distant organs.[7,8] In contrast, CT examination offers a more comprehensive diagnostic capability. In addition to accurately identifying the exact location, size, and extent of gastric tumors, it can detect the spread of cancer cells within the stomach, including their migration to abdominal lymph nodes and distant organs.[8]

However, fiberoptic gastroscopy fails to demonstrate alterations in the mucosal folds surrounding the gastric mass, changes in gastric wall stiffness, and the cessation of peristalsis.[9,10] Although both gastrointestinal angiography and multi-slice spiral CT have individual strengths for diagnosing gastric cancer, their combined diagnostic approach in the context of this disease remains unclear.

As the incidence of gastric cancer is consistently rising, it has become crucial to develop an effective, rapid, and precise diagnostic approach to improve early detection rates and save patients' lives. To identify the best diagnostic method and guide clinical treatment, we conducted a thorough analysis of the diagnostic accuracy achieved with the combination of multi-slice spiral CT and gastrointestinal angiography for gastric cancer. This study aimed to provide a more reliable reference and practical guidance for future clinical diagnosis of gastric cancer, eventually enhancing the health and survival prospects of patients with this condition.

MATERIALS AND METHODS

Study Design

A retrospective analysis was conducted on clinical data from 151 patients suspected of having gastric cancer, with an average age of (48.34±2.04), who were admitted to Shanxi Bethune Hospital, Shanxi Academy of Medical Sciences, between January 2014 and January 2022. Of these patients, 81 received a confirmed diagnosis of gastric cancer through pathological examination.

Patients were categorized into two groups: the control group, comprising 70 patients examined solely with multi-slice spiral CT, and the combination group, consisting of 81 patients who underwent both multi-slice spiral CT and gastrointestinal barium contrast examinations. All patients provided written informed consent. The study received approval from the hospital's ethics committee and was conducted following the principles outlined in the Helsinki Declaration.

Inclusion and Exclusion Criteria

Patients meeting the following criteria were included in the study: (1) confirmed diagnosis of gastric cancer through pathology; (2) alignment with surgical indications; (3) aged between 24 and 81 years; and (4) possessing complete clinical data. Patients meeting any of the following criteria were excluded from the study: (1) a history of radiotherapy and chemotherapy treatment; (2) severe organ dysfunction; (3) significant medical or surgical comorbidities; (4) evidence of inflammation or infection; (5) a history of multiple abdominal operations; (6) suspicion of multiple tumor metastases; and (7) refusal to undergo surgical treatment.

Digestive Tract Barium Angiography

We utilized the SIEMENS AXIOM Iconos R200 gas-barium double radiography system for this procedure. Patients were instructed to fast for at least 6 hours before the examination. Three minutes before the examination, they were administered 3 grams of gas-producing powder orally and 30 mL of 200% barium sulfate. We captured images in upright and semi-recumbent positions to assess gastric wall softness, peristalsis, mucosal condition, filling defects, niche shadows, and flexibility.

Multi-Slice Spiral CT Examination

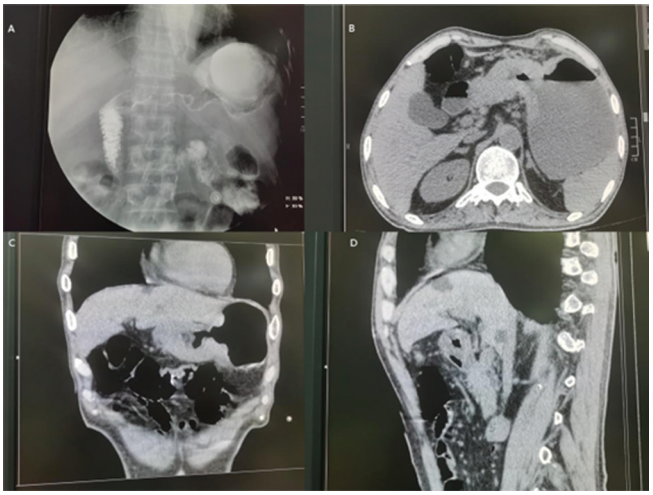
Patients underwent CT imaging using the SIEMENS SOMATOM Definition Flash CT machine. Patients were instructed to consume 800-1000 ml of warm water eight minutes before the examination. The CT machine's slice thickness and interval were set at 5 mm, with a pitch of 1.0. Patients were positioned supine for the initial routine scan, followed by an enhanced scan.

An injection of Ioversol (Jiangsu Hengrui Pharmaceutical Co., Ltd., H20067896) was administered via a high-pressure syringe into the patient's cubital vein, with an 80-100 ml dosage and an injection rate of 3 ml/s. Subsequently, arterial phase imaging was conducted at 25 to 30 seconds, followed by venous phase imaging at 60 to 70 seconds. The scan encompassed the region from the top of the diaphragm to the horizontal segment of the duodenum, allowing for the detection of cancer cells metastasized to abdominal lymph nodes and distant organs. Finally, a 1-mm thin-slice scan of the region of interest within the patient's stomach was performed. Please refer to Figure 1 for CT angiography.

Clinical Evaluation

Two experienced radiologists evaluated the diagnostic results. In cases of disagreement, the final results were determined through consultation and consensus. We analyzed and compared the diagnostic agreement rates and imaging findings between the two groups using pathological

Figure 1. Results of Imaging Tests



Note: (A) Angiography reveals restricted expansion and stiffness in the gastric wall. (B) Cross-sectional CT images. (B) Cross-sagittal CT images. (C) Cross-coronal CT images. The CT results demonstrate substantial thickening of the gastric wall in the antrum. The degree of thickening can be quantified and used as a diagnostic criterion to assess the severity or extent of the condition.

examination results as the reference standard. The following definitions were used: (1) True Positive (TP): The study's results were positive, and the gold standard also indicated a positive diagnosis; (2) False Positive (FP): The study's results were positive, but the gold standard indicated a negative diagnosis; (3) True Negative (TN): The study's results were negative, and the gold standard also indicated a negative diagnosis; (4) False Negative (FN): The study's results were negative, but the gold standard indicated a positive diagnosis.

We calculated the following parameters to assess diagnostic performance: (1) Sensitivity: TP / (TP + FN) × 100%; (2) Specificity: TN / (TN + FP) × 100%; (3) Accuracy: (TP + TN) / Total × 100%.

Observation Indicators

The study encompassed several key observation indicators: (1) Patient Demographics: General patient information was carefully collected. (2) Diagnosis Type and Accuracy: The diagnostic types and accuracy rates of gastric cancer within the two study groups were systematically analyzed and compared. (3) Lymph Node Metastasis: The occurrence of lymph node metastasis in both groups was diligently recorded and categorized. This included the examination of various lymph node regions, such as suprapyloric lymph nodes, lesser curvature lymph nodes, left and right cardiac lymph nodes, greater gastric curvature lymph nodes, and sub-pyloric lymph nodes.

(4) Imaging Features: Distinctive imaging characteristics were documented for both groups. These included central depressions, pedunculated bulges, gastric wall relaxation, mucosal changes within the gastric wall, and evidence of lymph node metastasis. The objective of observing these four key indicators was to provide a comprehensive evaluation of the diagnostic methodology for patients and assess the diagnostic and evaluative value of these indicators.

Table 1. Comparision of Baseline Characteristics Between two Groups [n (%)]

Factors	Combination Group n = 81	Control Group n = 70	χ^2	*P* value
Gender			0.003	.959
Male	42(51.85)	36(51.43)		
Female	39(48.15)	34(48.57)		
Age			0.075	.784
≤48	40(49.38)	33(47.14)		
>48	41(50.62)	37(52.86)		
BMI(kg/m^2)			0.038	.845
≤22	45(55.56)	40(57.14)		
>22	36(44.44)	30(42.86)		
Marital Status			0.030	.862
Married	71(87.65)	62(88.57)		
Unmarried	10(12.35)	8(11.43)		
Diagnosed with Gastric Cancer			0.257	.612
Yes	45(55.56)	36(51.43)		
no	36(44.44)	34(48.57)		
Gastric Cancer Staging			0.000	.999
Phase I to II	35(77.78)	28(77.78)		
Phase III	10(22.22)	8(22.22)		

Note: This table provides an overview of the general demographic characteristics and clinical factors of patients in the combination group (n = 81) and control group (n = 70) participating in the study. The table includes information on gender, age, BMI (body mass index), marital status, diagnosis of gastric cancer, and the staging of gastric cancer. The χ^2 values and associated *P* values are presented to assess the comparability of these factors between the two groups.

Table 2. Clinical Diagnosis Results of CT and Combined Detection of CT and Gastrointestinal Angiography

Inspection Method	Pathological Diagnosis			Kappa
	Gastric Cancer	Non-Gastric Cancer	Total	
Combined Diagnosis				0.723
Gastric Cancer	42	3	45	
Non-Gastric Cancer	3	33	36	
Total	45	36	81	
Single CT				0.642
Gastric Cancer	27	5	32	
Non-Gastric Cancer	9	29	38	
Total	36	34	70	

Note: This table presents the clinical diagnosis results of patients using two different inspection methods: combined diagnosis (multi-slice spiral CT and gastrointestinal angiography) and single CT. The table displays the number of cases diagnosed with gastric cancer and non-gastric cancer based on pathological diagnosis. The Kappa statistics are included to assess the agreement between the diagnostic methods. Higher Kappa values indicate greater agreement.

Table 3. Comparison of The Diagnostic Value of Single CT And CT Combined with Gastrointestinal Angiography For Gastric Cancer

Diagnosis	Combination Group n = 81	Control Group n = 70	χ^2	*P* value
Sensitivity	42/45(95.65)	27/36(84.38)	5.327	.021
Specificity	33/36(91.67)	29/34(85.29)	0.702	.402
Accuracy	75/81(92.59)	56/70(80.00)	5.182	.023

Note: This table compares the diagnostic value of a single CT and CT combined with gastrointestinal angiography for gastric cancer. It presents data on sensitivity, specificity, and overall accuracy in both the combination group (n = 81) and the control group (n = 70). The χ^2 values and associated *P* values are provided to assess the statistical significance of the differences in diagnostic performance between the two groups. Sensitivity: The proportion of correctly identified positive cases; Specificity: The proportion of correctly identified negative cases; Accuracy: The overall proportion of correctly identified cases.

Statistical Analysis

We conducted statistical analysis using SPSS 19.0 (International Business Machines Corporation, USA). The count data were presented as percentages, and comparisons between the two groups were assessed using the chi-square analysis. We employed the *t* test for measurement data, and

Table 4. The Results of Single CT and CT Combined with Gastrointestinal Angiography in the Diagnosis of Gastric Cancer Lymph Node Metastasis

Inspection Method	Pathological Diagnosis		
	Transferred	Not Transferred	Total
Combination Diagnosis			
Transferred	38	2	40
Not Transferred	3	2	5
Total	41	4	45
Single CT			
Transferred	21	2	23
Not Transferred	9	4	13
Total	30	6	36

Note: This table displays the results of diagnostic methods, including single CT and CT, combined with gastrointestinal angiography, in the diagnosis of gastric cancer lymph node metastasis. The table presents the number of cases that were accurately diagnosed as "Transferred" or "Not Transferred" based on pathological diagnosis.

Table 5. Comparison of the diagnostic value of single CT and CT combined with gastrointestinal angiography for lymph node metastasis in gastric cancer

Diagnosis	Combination Group n = 45	Control Group n = 36	χ^2	*P* value
Sensitivity	38/41(90.48)	21/30(70.00)	4.959	.026
Specificity	2/4(50.00)	4/6(66.67)	0.278	.598
Accuracy	40/45(88.89)	25/36(69.44)	2.184	.029

Note: This table compares the diagnostic performance of single CT and CT combined with gastrointestinal angiography for lymph node metastasis in gastric cancer. Sensitivity: The proportion of correctly identified positive cases; Specificity: The proportion of correctly identified negative cases; Accuracy: The overall proportion of correctly identified cases.

Table 6. Diagnostic Results of Clinical Staging of Gastric Cancer by Single CT and CT Combined with Gastrointestinal Angiography

Detection Rate	Combination Group n=45	Control Group n=36	χ^2	*P* value
Phase I to II	32/35 (91.43)	19/28 (67.86)	5.605	.018
Phase III	10/10 (100.00)	8/8 (100.00)	0.001	.999

Note: This table presents the diagnostic results of clinical staging of gastric cancer by single CT and CT combined with gastrointestinal angiography. Phase I to II: Refers to the early stages of gastric cancer. Phase III: Refers to the advanced stage of gastric cancer. Detection Rate: The proportion of correctly identified cases in each cancer stage. The numbers in parentheses represent the specific values and percentages for each diagnostic parameter.

Table 7. Comparison of Imaging Features of the Two Groups

Imaging Features	Combination Group n = 45	Control Group n = 36
Center Depression	30	-
Banded Bulge	20	-
Gastric Wall Relaxation	34	-
Gastric Mucosal Changes	43[a]	28
Lymph Node Metastasis	38[a]	22

[a]$P > .05$, Indicates no statistically significant difference between the two groups for the mentioned features.

Note: This table compares the imaging features of the two groups. Gastric Mucosal Changes: Refers to alterations in the gastric mucosa. Lymph Node Metastasis: Indicates the presence of lymph node metastasis. "-" signifies that a particular item was not observed in the control group.

for enumeration data, the chi-square test (χ^2) was utilized. The diagnostic efficacy between the study's methodology and the gold standard was evaluated using the Kappa test, with statistical significance considered when $P < .05$.

RESULTS

Comparison of Baseline Data

The subjects exhibited no significant differences in gender, age, or BMI, with $P > .05$. Refer to Table 1 for details.

Comparison of Clinical Diagnosis Efficacy: Single CT vs. Combined CT and Gastrointestinal Angiography

The combination of CT and gastrointestinal angiography demonstrated significantly higher sensitivity (95.65%) and accuracy (92.59%) in diagnosing gastric cancer compared to a single CT ($P < .05$). However, there was no notable difference in diagnostic specificity between the two methods ($P > .05$). The above findings indicate that the combination of CT and gastrointestinal radiography holds greater diagnostic value for gastric cancer compared to CT alone, as detailed in Table 2 and Table 3.

Comparison of Single CT vs. CT Combined with Gastrointestinal Angiography in Detecting Lymph Node Metastasis in Gastric Cancer

Among the 81 gastric cancer patients in the study, 36 were diagnosed using single multi-slice spiral CT, with 30 of them showing lymph node metastasis. It resulted in a diagnostic accuracy of 69.44% (25/36) and a sensitivity of 70.00% (21/30). In contrast, 45 patients were diagnosed using CT combined with gastrointestinal angiography, with 41 of them demonstrating lymph node metastasis. The combined approach achieved a coincidence rate of 88.89% (40/45) and a sensitivity of 90.48% (38/41).

These results indicate that the combined diagnosis method aligns more closely with postoperative pathological examination findings compared to a single CT diagnosis of lymph node metastasis. It significantly enhances clinical judgment regarding lymph node metastasis in patients ($P < .05$); see Table 4 and Table 5.

Comparison of Clinical Staging Diagnosis of Gastric Cancer: Single CT vs. CT Combined with Gastrointestinal Angiography

The diagnostic rate of CT combined with gastrointestinal angiography for stage I-II gastric cancer was significantly higher than that of single CT (91.43% vs. 67.86%, $P < .05$). There was no statistically significant difference in the detection rate for stage III ($P > .05$). These results suggest that CT combined with gastrointestinal radiography is more effective in determining the stage of gastric cancer patients, providing valuable guidance for selecting appropriate clinical treatment options, refer to Table 6.

Comparison of Imaging Features: Gastrointestinal Angiography vs. Multi-Slice Spiral CT

A single multi-slice spiral CT image could only detect characteristics related to gastric wall mucosal changes and lymph node metastasis. In contrast, the combined detection of digestive tract angiography and CT allows for the assessment of additional image features, including central

depression, pedunculated bulge, and gastric wall relaxation. This finding suggests that the combined approach of gastrointestinal radiography and CT observation provides a more comprehensive evaluation of lesions in patients with gastric cancer, refer to Table 7.

DISCUSSION

Gastric cancer is a prevalent condition encountered in clinical practice. In its early stages, gastric cancer is often confined to the mucosal or submucosal layers, and it may manifest as abdominal discomfort or epigastric pain, often lacking distinctive clinical symptoms.[11] Intermediate-advanced gastric cancer is characterized by cancer tissue infiltrating into the muscle layer or beyond, often exhibiting low differentiation and deep infiltration of the gastric wall.[12] As gastric cancer progresses to its intermediate and advanced stages, it becomes more detectable and diagnosable. However, this progression also increases the likelihood of missing the optimal treatment window, leading to lower survival rates. Therefore, early screening becomes critically important among these patients.[13]

Currently, in clinical practice, various methods, including gastroscopic biopsy, upper gastrointestinal angiography, and spiral CT, are commonly employed to diagnose patients with suspected gastric cancer.[14] Gastroscopic biopsy is often considered the gold standard for gastric cancer diagnosis. However, its discomfort frequently results in reduced patient compliance.[15]

This study analyzed the diagnostic value of multi-slice spiral CT combined with gastrointestinal angiography to explore an effective diagnostic scheme for gastric cancer. Our findings revealed that the combined approach significantly improved the sensitivity and accuracy of diagnosing gastric cancer compared to using a single CT alone. Additionally, it demonstrated a notably higher detection rate for stage I and stage II gastric cancer in comparison to a single CT diagnosis.

Our study suggests that the combined approach of multi-slice spiral CT and gastrointestinal angiography has proven highly effective in the diagnosis and staging of gastric cancer. The analysis of the imaging characteristics of these two examination methods revealed that CT examinations were adept at accurately determining the specific location, extent, and size of gastric tumors. The study confirmed their ability to detect cancer cell metastasis within the stomach to abdominal lymph nodes and distant organs. However, CT alone failed to capture changes in the mucosal folds surrounding the gastric mass, the rigidity of the gastric wall, and the absence of peristalsis.[16] These limitations are believed to be responsible for the suboptimal diagnostic performance of CT as a standalone method in gastric cancer.

Upper gastrointestinal angiography, on the other hand, offered clear visualization of factors such as location, size, mucosal fold changes, cancerous gastric ulcers, and gastric wall peristalsis. However, its diagnostic scope is limited to lesions within the gastric cavity, and it lacks the precision to determine tumor infiltration into the gastric wall, cancer cell metastasis to abdominal lymph nodes, or distant organs.[17] Although there was no significant difference in the detection of lymph node metastasis in gastric cancer between the two diagnostic methods, the combined approach exhibited higher diagnostic accuracy for gastric cancer in comparison to the control group.

We also conducted an analysis of lymph node metastasis in gastric cancer patients. Initial studies have demonstrated that lymph node metastasis serves as an independent risk factor significantly influencing patient prognosis and profoundly shaping surgical treatment plans.[18] As a result, there is a need to improve preoperative diagnostic examinations for lymph node metastasis to enhance the effectiveness of radical surgery for gastric cancer.

The process of metastasis in gastric cancer represents an invasive phenomenon characterized by increased blood vessels and lymph nodes around the gastric cavity compared to other regions. If not effectively controlled, primary tumor cells can infiltrate distant lymph nodes through vascular drainage, resulting in the formation of lymph node metastasis.[19] Enhanced CT, which is the simplest and most effective imaging technique for diagnosing gastric cancer, aids in differentiating lymph node metastasis in gastric cancer. However, it is associated with some false positives and false negatives.[20]

Gastrointestinal barium angiography provides a clear visualization of lesions within the gastric cavity, particularly facilitating the observation of gastric mucosal changes and gastric peristalsis.[21] This study demonstrated that CT combined with gastrointestinal angiography achieved a higher lymph node detection rate compared to a single CT. This improvement can be attributed to the ability to observe imaging features such as central depression, pedicle bulge, and gastric wall relaxation, which were not visible in the control group. Moreover, there were no significant differences in the characteristics of gastric mucosal changes and lymph node metastasis between the two groups.

The findings also illustrate that, in comparison to a single CT diagnosis, combined examination allows for the simultaneous observation of lymph node metastasis and gastric functional changes in gastric cancer. A study conducted by Chai et al.[22] found that the accuracy of multi-slice spiral CT in detecting lymph nodes in patients with gastric cancer is significantly influenced by the lymph node's diameter. Lymph nodes with a diameter of 0.5 cm or larger exhibited higher accuracy in detection, whereas those smaller than 0.5 cm had lower detection accuracy, primarily due to the relatively lower resolution of soft tissue. As a result, there is a propensity for missed detection, impacting the assessment of lymph node metastasis.

This study also revealed that CT alone exhibited limited effectiveness in diagnosing early gastric cancer, aligning with previous studies. Therefore, when employing multi-slice spiral CT for lymph node metastasis detection in gastric cancer, consideration of a combined detection approach is recommended. Furthermore, a study by Xiong et al.[23]

demonstrated that multi-slice spiral CT combined with gastrointestinal angiography for gastrointestinal protruding lesions yields excellent diagnostic outcomes, further supporting our results.

Our findings emphasize the importance of adopting a comprehensive diagnostic approach for improved clinical outcomes in gastric cancer management. By enhancing accuracy in lymph node metastasis detection and offering insights into functional changes, the combined approach can lead to earlier, more precise diagnoses and better treatment planning, ultimately improving patient outcomes and prognosis. This approach has the potential to elevate the standard of care for individuals facing gastric cancer.

Study Limitations

We acknowledge a few limitations in this study. The relatively small sample size warrants caution in generalizing these findings, emphasizing the need for validation through larger-scale investigations. Furthermore, this study focused exclusively on assessing the accuracy of the proposed diagnostic approach without direct comparison to alternative combined diagnostic methods. As a result, the determination of whether this approach stands as the optimal diagnostic strategy for gastric cancer patients necessitates further investigation and longitudinal follow-up studies.

CONCLUSION

The findings of this study highlight the notable advantages of employing multi-slice spiral CT in conjunction with gastrointestinal angiography when compared to single CT. This combined approach significantly improves the accuracy of clinical diagnosis, staging, and lymph node metastasis assessment in gastric cancer. These outcomes not only furnish a robust foundation for the clinical diagnosis and treatment of gastric cancer but also offer essential implications for future diagnostic choices in the field. As we reflect upon these results, it becomes evident that the integration of combined diagnostic methods warrants further exploration and consideration in the pursuit of enhancing gastric cancer diagnosis and patient care.

DATA AVAILABILITY STATEMENT

The labeled dataset used to support the findings of this study is available from the corresponding author upon request.

CONFLICT OF INTEREST

The author declares no competing interests.

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This study did not receive any funding in any form.

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