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ORIGINAL RESEARCH

Comparative Evaluation of Endoscopic Ultrasonography and Multi-Slice Spiral CT in Diagnosing Gastrointestinal Stromal Tumors: A Retrospective Study

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Objective: To evaluate the accuracy and clinical value of endoscopic ultrasonography (EUS) in the diagnosis of gastrointestinal stromal tumors (GIST).

Methods: This single-center retrospective study analyzed 100 GIST patients at a tertiary hospital (2022.12–2025.02). Sample size was justified by pre-experimental results (EUS sensitivity 90%, MSCT 80%, α=0.05, β=0.2) to detect ≥10% diagnostic efficacy difference. All patients underwent preoperative EUS and multi-slice spiral computed tomography (MSCT) scans. The diagnostic results of EUS, MSCT, and postoperative pathology were compared. The examination time and detection status were recorded, and diagnostic performance metrics such as sensitivity and specificity, as well as the accuracy rates of localization and qualitative diagnosis, were calculated. Additionally, the imaging characteristics of EUS were analyzed.

Results: EUS was significantly superior to MSCT in sensitivity (94.92% vs 88.14%), specificity (87.80% vs 73.17%) and localization accuracy (90.00% vs 68.00%) ($p<0.05$). Although the EUS examination time was longer (10.11 ± 2.37 vs 5.96 ± 1.85 min, $P<0.05$), However, its ability to recognize the typical features of GIST (hypoechoic mass, clear boundary) is stronger, and the misdiagnosis rate is lower.

Conclusion: Clinical decisions should prioritize EUS for initial evaluation of suspected submucosal GISTs, while reserving MSCT for assessing tumor extent and metastasis, balancing diagnostic efficacy with examination time considerations.

Keywords: gastrointestinal stromal tumor, endoscopic ultrasonography, diagnostic accuracy, retrospective study, pathological staging

Introduction

Gastrointestinal Stromal Tumor (GIST) is the most common mesenchymal tumor of the digestive tract, originating from the interstitial cells of Cajal or their precursor cells adjacent to the autonomic ganglia in the digestive tract. It has an annual incidence of approximately 1.1–22 per million population and accounts for 0.1–3% of all malignant gastrointestinal tumors.[1,2] Its biological behavior exhibits high heterogeneity, ranging from benign indolent lesions to highly malignant invasive tumors. Approximately 15–50% of GISTs already have a risk of metastasis or recurrence at the time of diagnosis, making early and accurate diagnosis crucial for prognosis assessment and treatment strategy selection.[3–5]

Among traditional imaging examinations, multi-slice spiral computed tomography (MSCT) has long been the preferred screening tool for GIST due to its advantages of speed, non-invasiveness, and large-scale scanning. MSCT can clearly display the size, shape, boundaries of the tumor, and its relationship with surrounding tissues, and assess blood supply characteristics and metastasis through enhanced scanning, especially holding irreplaceable value in evaluating tumor staging and distant metastasis.[6] Endoscopic Ultrasonography (EUS) combines a high-frequency

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ultrasound probe with an endoscope, overcoming the limitations of traditional imaging in displaying the layers of the digestive tract wall. Its high-frequency probe (5–20 MHz) can clearly distinguish the five layers of the digestive tract wall (mucosa, muscularis mucosae, submucosa, muscularis propria, and serosa), thereby accurately localizing the tumor's origin layer. By analyzing echo characteristics (such as hypoechogenicity, boundary clarity, and internal homogeneity), it can preliminarily determine the nature of the tumor. Combined with color Doppler or contrast-enhanced ultrasound, it can also assess tumor blood supply and malignant potential.[7,8] In recent years, the application value of EUS in the diagnosis of GIST has been confirmed by multiple studies, significantly outperforming traditional ultrasound and CT. According to NCCN guidelines (2024 version), MSCT is still the preferred tool for initial screening of gist, while ESMO guidelines (2023) emphasize the irreplaceable role of EUS in localization diagnosis. This study systematically compared the comprehensive efficacy of EUS and MSCT in the diagnosis of gist in combination with the recommendations of the guidelines.

Previous studies may not fully reflect the diagnostic differences between EUS and MSCT due to the limited sample size (eg, n<50). This study included 100 patients to enhance the statistical effect and effectively fill this gap. Some studies suggest that EUS has absolute advantages in localization and qualitative diagnosis, while others point out that MSCT is irreplaceable in assessing tumor extent and metastasis. The hypothesis of this study: EUS has higher diagnostic accuracy, positioning diagnostic accuracy and qualitative diagnostic accuracy in the diagnosis of GIST than MSCT. This hypothesis will be verified by the clinical data of 100 patients with GIST.

Research and Methods

Study Design and Ethics

This study employed a retrospective analysis design, selecting patients who met the inclusion criteria by reviewing case records from our hospital. Initially, the clinical data of patients diagnosed with and treated for Gastrointestinal Stromal Tumor (GIST) at a tertiary grade-A hospital from December 2022 to February 2025 were considered for inclusion. After applying complete inclusion criteria to ensure sample representativeness, a total of 100 patients were included in the study, all of whom underwent both Endoscopic Ultrasonography (EUS) and multi-slice spiral computed tomography (MSCT) scans before surgery. The study received approval from our ethics committee of the First Affiliated Hospital of Air Force Medical University and was conducted in strict accordance with the 1964 Declaration of Helsinki and its subsequent revisions or equivalent ethical standards. Given that this study was retrospective, with data sourced from previous clinical records and no additional risk imposed on patients, our hospital's ethics committee waived the informed consent procedure. Privacy security was ensured by anonymizing all case data and establishing a tiered access control mechanism.

Patient Eligibility Criteria

The inclusion conditions were set as follows: diagnostic evidence must conform to the immunophenotypic characteristics of positive CD117, CD34, and DOG-1 immunohistochemical detection, with weak positive or negative S-100 expression; patients must exhibit typical clinical manifestations such as persistent abdominal pain and bloating; a definitive diagnosis of gastrointestinal stromal tumor must be confirmed by postoperative pathological examination;[9–11] both EUS and MSCT imaging examinations must be completed synchronously before surgery; patients must be 18 years of age or older; clinical medical records must be complete without omissions; and patients must have no prior history of oral imatinib mesylate treatment or any chemotherapy.

The exclusion criteria included: patients with concurrent other malignant tumors of the digestive tract; those who had received radiotherapy, chemotherapy, or targeted therapy before surgery; patients whose EUS or MSCT imaging quality was poor and could not be effectively evaluated; cases with abdominal organ metastasis; patients with liver or kidney function impairment; those with comorbid conditions of other digestive tract tumors; patients with severe organic diseases; and those with mental disorders that prevented them from cooperating with the examination.

Imaging Procedures

Operational norms for Endoscopic Ultrasonography: Patients were required to fast from food and drink for 8 to 12 hours before the examination. Pharyngeal surface anesthesia was achieved by oral administration of lidocaine hydrochloride gastroscope lubricant. After the patient assumed a left lateral decubitus position, the endoscopic ultrasound probe was slowly advanced through the oropharynx to the descending part of the duodenum. During the withdrawal of the probe, systematic observation of the duodenal, gastric, and esophageal mucosa was conducted, with the option to inflate for dilation, inject water for lubrication, or aspirate secretions as needed to maintain a clear field of view. Under white-light endoscopy mode, the location, number, appearance, shape, and texture characteristics of the tumor were recorded. Subsequently, bubble-free water was injected into the gastric cavity, and an ultrasound probe was inserted. Under ultrasound imaging mode, detailed assessment of the lesion size, shape, contour, boundary clarity, origin layer localization, echo intensity distribution, and uniformity characteristics was performed, while screening for pathological signs such as internal necrosis foci or cystic changes.[12,13]

Implementation procedure for multi-phase enhanced scanning with multi-slice spiral CT: Prior to the examination, patients are required to fast for 8 to 12 hours and discontinue medications such as bismuth agents that may affect imaging quality. Based on medical advice, patients may maintain a fasting state or orally ingest 1 liter of purified water 15 minutes before the examination, or use an intestinal distension mixture composed of 250 mL of purified water, 250 mL of 20% mannitol injection, and 500 mL of 5% glucose injection to optimize intestinal visualization. During the examination, patients assume a supine or lateral decubitus position and are instructed to hold their breath before scanning to ensure image quality. A GE Discovery 750 CT scanner is used for scanning, with parameter settings including a plain scan tube voltage of 120 kV, tube current dynamically adjusted within the range of 100 to 600 mA using automatic mAs technology, a collimator width of 0.625 mm, a gantry rotation speed of 0.6 seconds per rotation, a pitch of 0.983, and a reconstruction slice thickness of 1.25 mm. The scanning range extends from the superior margin of the liver to the level of the anterior superior iliac spine. First, an abdominal plain scan is performed, followed by the injection of iohexol contrast agent (dose of 1.0 mL/kg) at a flow rate of 3.5 to 4.0 mL/s through the antecubital vein. The scanning program is triggered when the CT value of the abdominal aorta reaches 50 HU. Enhanced scans are then performed at 8 seconds, 30 seconds, and 120 seconds after triggering for the arterial phase, venous phase, and delayed phase, respectively, ensuring precise timing of image acquisition in each phase for multidimensional assessment of lesions.[14,15]

Observation Indicators

Examination duration: The operation times required for Endoscopic Ultrasonography (EUS) and multi-slice spiral CT (MSCT) are recorded and compared in minutes, quantifying the differences in examination efficiency between the two methods through precise timing.

Tumor detection: The detection results of tumors by EUS and MSCT are systematically recorded, including specific indicators such as the number and proportion of detected tumors, analyzing the differences in tumor identification capabilities between the two methods.

Diagnostic efficacy assessment: Using pathological examination results as the diagnostic gold standard, the sensitivity, specificity, and accuracy indicators of EUS and MSCT are compared and analyzed. Sensitivity is calculated by dividing the number of true positive cases by the sum of true positive and false negative cases, then multiplying by 100%; specificity is calculated by dividing the number of true negative cases by the sum of true negative and false positive cases, then multiplying by 100%; accuracy is calculated by dividing the sum of true positive and true negative cases by the total number of cases, then multiplying by 100%, comprehensively evaluating the diagnostic performance of the two examination methods.

Analysis of accuracy in localization and qualitative diagnosis: Tumor localization diagnosis requires specifying the exact location of the cancerous lesion. The localization diagnostic features of EUS are as follows: lesions with a diameter less than 2 cm often appear as submucosal localized, round-like hypoechoic areas with uniform internal echoes and clear boundaries; lesions with a diameter greater than 5 cm often exhibit extraluminal multi-protrusion growth, with lobulated or irregular shapes, uneven internal echoes, and visible liquid dark areas of various shapes. The localization diagnostic

features of multi-phase enhanced scanning with MSCT are as follows: lesions with a diameter less than 2 cm often exhibit a benign growth pattern, appearing as soft tissue masses with uniform enhancement, regular shapes, uniform density, and clear boundaries; lesions with a diameter greater than 5 cm often have irregular shapes, blurred boundaries, uneven enhancement, and visible tortuous vascular shadows around them. Tumor qualitative diagnosis requires determining the nature of the tumor through pathological examination, including specific methods such as exfoliative cytology examination and biopsy, ultimately confirming the benign or malignant nature and specific type of the tumor through pathological means.

Inter observer reliability was evaluated by Cohen's kappa coefficient. The kappa values of EUS and MSCT images were 0.85 and 0.78, respectively, indicating good diagnostic consistency.

Double blind method was used for image analysis: EUS and MSCT images were interpreted by two independent radiologists (with more than 5 years' experience), who were unaware of the patient's pathological results and another image examination results. The final diagnosis was determined by consensus, and the kappa value was 0.82, indicating good consistency among observers.

Statistical Analysis

All the data of this study are from the electronic medical record system of our hospital, which ensures the authenticity and reliability of the data. In the process of data collection, we strictly followed the principle of privacy protection and anonymized all patient information.

Double check mechanism was used for data verification: two researchers independently extracted the electronic medical record data, and the difference rate was solved through negotiation when the difference rate was less than 5%; The sample size was calculated based on the pre experimental results (EUS sensitivity 90%, MSCT sensitivity 80%), α=0.05, β=0.2), The difference of $\geq$ 10% can be detected in 100 samples.

Image processing in this study was conducted using GraphPad Prism 8 software, while research data were collated and analyzed using SPSS 26.0. Measurement data were expressed as ($\bar{x} \pm$ s), and comparisons between groups were performed using *t*-tests. Count data were expressed as [n (%)], and comparisons between groups were performed using X^2 tests. A P-value < 0.05 was considered statistically significant.

Results

Patient Information

This study included 100 patients with gastrointestinal stromal tumors (GISTs), comprising 59 males and 41 females, aged 35–68 years, with an average age of (48.21 ± 5.63) years. Clinical symptoms included abdominal pain in 38 cases, abdominal distension in 27 cases, abdominal discomfort in 14 cases, heartburn and acid reflux in 9 cases, fatigue in 6 cases, cough in 4 cases, and no obvious symptoms in 2 cases. See Tables 1 and 2.

Examination Time

The examination time for Endoscopic Ultrasonography (EUS) was longer than that for Multi-Slice Spiral Computed Tomography (MSCT) ((10.11 ± 2.37) vs (5.96 ± 1.85)) minutes, P < 0.05. See Figure 1.

Table 1 Case Screening Table

Step	Number of Cases	Explain
Preliminary screening	228	Preliminary screening of suspected gist cases from electronic medical record system
Application of inclusion criteria	149	Number of cases remaining after application of inclusion criteria
Exclusion criteria application	100	Number of cases finally included in the study after application of exclusion criteria
Number of excluded cases	128	The number and reasons of excluded cases because they did not meet the inclusion criteria or met the exclusion criteria

Table 2 Patient Information Included in the Study

		GIST
Number of cases	–	100
Gender	Male	59 (59.00%)
	Female	41 (41.00%)
Age (years)	–	35-68
	Mean	48.21±5.63
Clinical symptoms	Abdominal pain	38 (38.00%)
	Abdominal distension	27 (27.00%)
	Abdominal discomfort	14 (14.00%)
	Heartwarming and acid reflux	9 (9.00%)
	Weakness	6 (6.00%)
	Cough	4 (4.00%)
	No obvious symptoms	2 (2.00%)

Table 3 Comparison of Tumor Detection Rates Between the Two Examination Methods

	EUS	MSCT	X^2	*P*
Number of Cases	100	100	–	–
Countdown	93	90	–	–
Proportion	93.00%	90.00%	0.579	0.447

Tumor Detection

There was no statistically significant difference in tumor detection rates between EUS and MSCT (93.00% vs 90.00%), P > 0.05. See Table 3.

Diagnostic Efficacy

The sensitivity, specificity, and accuracy of EUS were all higher than those of MSCT (94.92% / 87.80% / 92.00% vs 88.14% / 73.17% / 82.00%), P < 0.05. See Figure 2.

Diagnostic Accuracy

The accuracy rates of localization and qualitative diagnosis with EUS were both higher than those with MSCT (90.00% / 79.00% vs 68.00% / 61.00%), P < 0.05. See Figures 3 and 4.

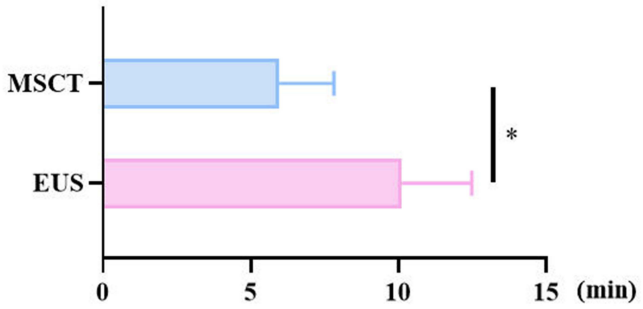

Figure 1 Comparison of Examination Times Between the Two Examination Methods.
Notes: *Indicates a significant difference between the two groups, P < 0.05.

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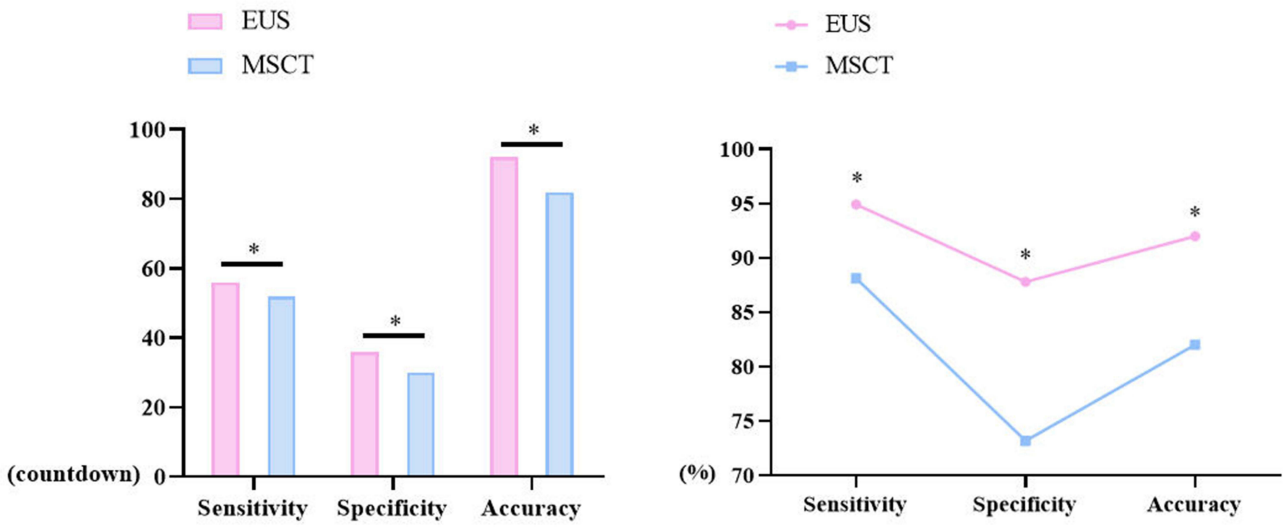

Figure 2 Comparison of Diagnostic Efficacy Between the Two Examination Methods.
Notes: *Indicates a significant difference between the two groups, P < 0.05.

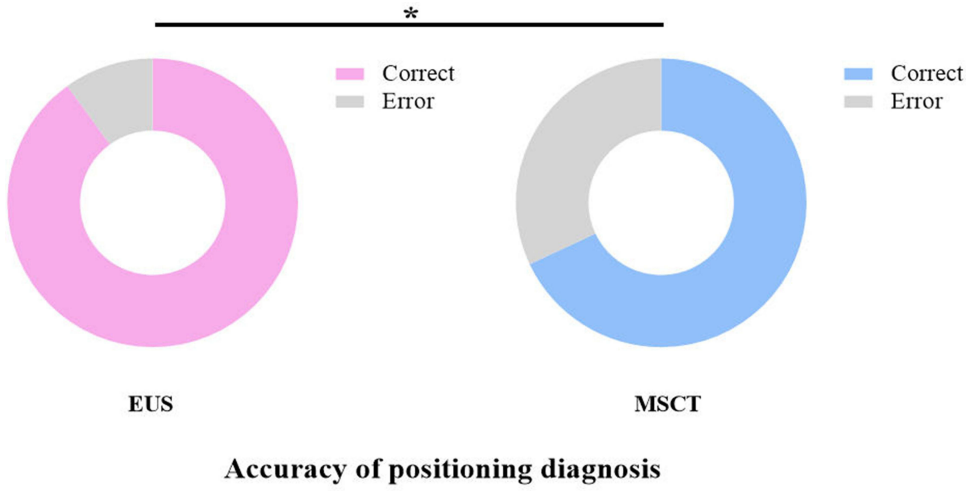

Figure 3 Comparison of Localization Diagnostic Accuracy Rates Between the Two Examination Methods.
Notes: *Indicates a significant difference between the two groups, P < 0.05.

EUS Imaging Features and Reasons for Misdiagnosis/Missed Diagnosis

EUS showed that GISTs mostly presented as hypoechoic masses with clear boundaries (83.00%), with uniform internal echoes (77.00%), and originating from the muscularis propria (91.00%). Among the 8 misdiagnosed cases, 3 were misdiagnosed as leiomyomas or schwannomas due to the special morphology of the tumors (eg, dumbbell-shaped, intraluminal type); 2 cases had difficulty in diagnosis due to the tumors being located in special positions such as the posterior wall of the stomach or the cardia, which limited the detection angle of EUS; 1 case was misdiagnosed as a lipoma or cyst due to complex echoes caused by liquefactive necrosis or hemorrhage inside the tumor; 1 case was missed due to insufficient resolution of EUS for a tumor with a diameter < 5 mm. In addition, 1 elderly patient was misdiagnosed due to compromised EUS image quality caused by concurrent gastric wall inflammation or ulcers.

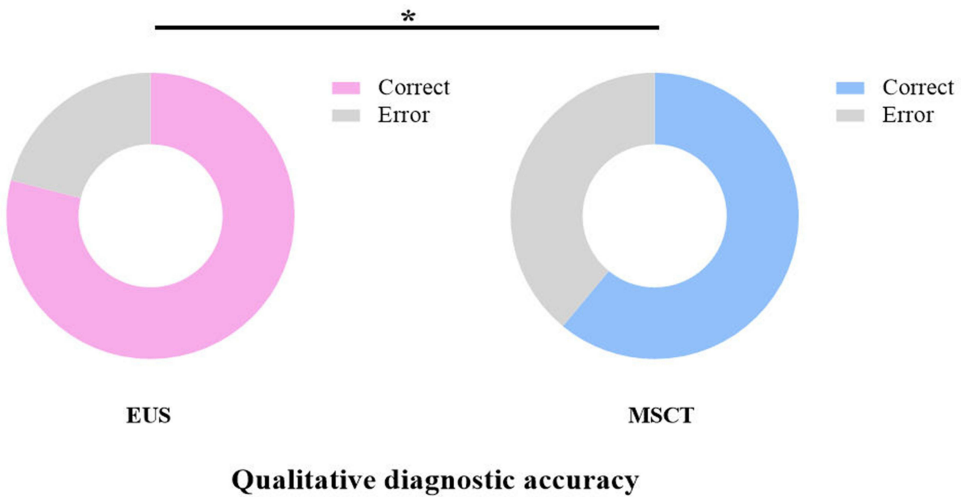

Figure 4 Comparison of Qualitative Diagnostic Accuracy Rates Between the Two Examination Methods.
Notes: *Indicates a significant difference between the two groups, P < 0.05.

Discussion

Among gastrointestinal mesenchymal tumors, gastrointestinal stromal tumors (GISTs) are the most common type, with an incidence rate accounting for approximately 0.1% to 3.0% of all gastrointestinal tumors. The male-to-female prevalence ratio is roughly equivalent, and the most common sites of occurrence are the stomach and small intestine. Patients often present with abdominal pain and gastrointestinal bleeding as the main clinical manifestations. In the diagnosis and treatment of GISTs, various examination methods such as color Doppler ultrasound, CT, endoscopy, and endoscopic ultrasonography (EUS) are commonly used for diagnosis, while conventionally used tumor markers do not exhibit significant specificity for confirming GISTs and play more of a role in auxiliary differential diagnosis.[16–18]

This study aimed to evaluate the comparative roles of EUS and multi-slice spiral computed tomography (MSCT) in the diagnosis of GISTs. Firstly, the results revealed that the examination duration of EUS was significantly longer than that of MSCT. This is attributed to the fact that endoscopic ultrasonography requires a series of operations, including endoscope insertion, gastric cavity insufflation, ultrasonic probe placement, and multi-planar scanning, and its operational complexity is much higher than that of CT's rapid volumetric scanning. Specifically, EUS necessitates the slow advancement of the endoscope through the oropharynx to the descending part of the duodenum, during which the probe angle must be continuously adjusted to obtain optimal ultrasonic images, and multiple insufflation and aspiration procedures are required to maintain a clear field of view, with each step requiring precise time control.[19–21] In contrast, MSCT employs a spiral scanning mode, enabling the acquisition of volumetric data from the entire abdomen within seconds. Coupled with automatic mAs technology, it can dynamically adjust the radiation dose, significantly shortening the examination time.[22,23] However, despite the longer duration of EUS, the microscopic structural information of the gastrointestinal wall layers it provides is irreplaceable by CT, and clinicians need to weigh examination efficiency against diagnostic value. The reason for the lack of significant difference in the detection rates between EUS and MSCT may stem from the complementary detection mechanisms of the two technologies for GISTs: EUS can clearly identify small submucosal tumors through high-frequency ultrasound, especially exhibiting high sensitivity for early GISTs with a diameter < 2 cm;[24] whereas MSCT can detect extra-luminal growth or metastatic lesions through its large-scale scanning capability. In terms of detection ability, the identification advantage of EUS for intra-luminal lesions is balanced by the detection capability of MSCT for extra-luminal lesions.[25,26] Notably, all three cases of missed diagnosis by MSCT were micro-lesions < 1 cm, suggesting inherent limitations of CT in detecting micro-GISTs; among the seven cases of missed diagnosis by EUS, four were due to tumors located in detection dead zones such as the posterior wall of the stomach, and three were due to image distortion caused by severe ulcers, which affected the absolute detection rate of EUS.

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The results of this study indicate that the diagnostic efficacy of EUS is comprehensively superior to that of MSCT. This study confirmed that the sensitivity, specificity, and accuracy of EUS are all significantly higher than those of MSCT. This advantage stems from EUS's microscopic analytical capability of the gastrointestinal wall layer structure: high-frequency ultrasound can clearly distinguish the five-layer structure of the gastrointestinal wall, accurately locate the tumor's origin layer, and effectively differentiate GISTs from leiomyomas, schwannomas, etc., by combining features such as low echo and clear boundaries. Specifically, previous similar clinical studies have found that EUS has a recognition rate of 94.92% for true-positive cases and a false-negative rate of only 5.08%, thanks to its specific recognition of tumors originating from the muscularis propria; whereas MSCT, due to its limited soft tissue resolution, has a false-negative rate of up to 11.86% for tumors < 2 cm. In terms of specificity, EUS can control the false-positive rate at 12.20% through echo feature analysis, significantly better than MSCT's 26.83%, which often misdiagnoses inflammatory masses or cysts as GISTs. This is consistent with the results of this study. Secondly, the study results also revealed that EUS has significant advantages in the accuracy rates of localization and qualitative diagnosis. At the level of localization diagnosis, EUS can precisely determine the relationship between the tumor and each layer of the gastrointestinal wall through endoscopic ultrasound fusion imaging, and its 90.00% localization accuracy rate stems from its specific recognition ability for tumors originating from the muscularis propria. In contrast, the 68.00% localization accuracy rate of MSCT is limited by its ability to display the layer structure of the gastrointestinal wall. In terms of qualitative diagnosis, EUS can effectively distinguish between very low-risk and high-risk GISTs by analyzing features such as tumor echo uniformity and boundary clarity, combined with the NIH risk grading criteria, and its 79.00% qualitative accuracy rate is significantly higher than MSCT's 61.00%. This difference is particularly significant in tumors with a diameter > 5 cm: EUS can clearly display lobulated boundaries and internal inhomogeneous echoes, whereas MSCT often leads to qualitative misdiagnosis due to partial volume effects.[27–30]

Additionally, the eight cases of misdiagnosis by EUS in this study revealed the specific mechanisms underlying diagnostic limitations. Among the three cases with special morphologies, dumbbell-shaped tumors were misdiagnosed as leiomyomas due to their cross-layer growth, and intra-luminal tumors were misjudged as inflammation due to surface ulcers; in two cases with special locations, image distortion occurred due to limited detection angles for tumors in the posterior wall of the stomach; one case of liquefactive necrosis was misdiagnosed as a cyst due to complex internal echoes; and one case of a micro-tumor < 5 mm was missed due to insufficient resolution. Notably, in one elderly patient, the presence of a concomitant gastric ulcer caused "pseudo-artifacts" in the EUS image. The interference of such comorbidities with image quality suggests that clinical judgment should integrate endoscopic white-light observation with ultrasonic features. These misdiagnosis cases collectively suggest that for cases with special morphologies, concealed locations, or concomitant inflammation, EUS-fine needle aspiration (EUS-FNA) should be used to obtain pathological specimens for confirmation, while scanning parameters should be optimized to improve the detection rate of micro-tumors.

Although this study validated the advantages of endoscopic ultrasonography (EUS) in the diagnosis of gastrointestinal stromal tumors (GISTs) through retrospective analysis, several non-negligible limitations remain that require careful consideration in clinical applications. Firstly, the retrospective nature of the study design constitutes a core limitation. All data were sourced from the electronic medical record system of a single tertiary-level hospital, and included patients were those diagnosed postoperatively and who underwent both EUS and MSCT examinations. This "predetermined outcome" screening approach may harbor selection bias—for example, patients who were too critically ill to tolerate endoscopic examinations or those with atypical imaging features who did not undergo EUS were not included. Secondly, the limitation of sample size cannot be overlooked. Although a sample size of 100 cases is considered moderate in retrospective studies, for a low-incidence tumor like GIST, statistical power may still be insufficient. In particular, the representation of rare subtypes (such as succinate dehydrogenase (SDH)-deficient GIST) or special locations (such as small intestinal GIST) may be inadequate, affecting the general applicability of the results to the entire GIST population. Thirdly, potential variations in the standardization of examination procedures exist. EUS examination is highly dependent on the operator's experience and skill—different endoscopists may have subjective differences in determining tumor boundaries and interpreting echo features. Although this study required two physicians to independently assess and reach a consensus, this subjectivity may still affect the consistency of diagnostic results. Similarly, although the scanning

parameters for MSCT were standardized, factors such as patient breath-holding compliance and bowel preparation quality may still affect image quality, thereby influencing detection rates and diagnostic accuracy. Fourthly, other imaging modalities were not included as controls in the study. For example, MRI has unique advantages in soft tissue resolution, especially for evaluating the relationship between tumors and nerves and blood vessels; PET-CT is irreplaceable in assessing tumor metabolic activity and distant metastases. This study only compared EUS with MSCT and failed to comprehensively reflect the combined value of different imaging modalities in GIST diagnosis, potentially underestimating the clinical potential of multimodal imaging. In light of the above, although this study strived for methodological rigor, it was still limited by multiple factors such as retrospective design, sample size, procedural standardization, singularity of control methods, and lack of prognostic evaluation. Future studies should adopt a prospective multicenter design, expand the sample size, introduce multimodal imaging comparisons, and incorporate long-term follow-up data to further validate and optimize the application value of EUS in GIST diagnosis. In addition, with the breakthrough of AI image recognition technology, the application of AI assisted EUS in GIST feature extraction can be explored in the future, such as automatic recognition of key indicators such as tumor boundary and internal echo uniformity. At the same time, the combined application of contrast-enhanced ultrasound (CEUS) and MSCT is worth studying, and the differential ability between benign and malignant tumors can be improved through dynamic enhancement mode analysis. This study focused on the comparison of diagnostic efficacy, and did not involve the evaluation of treatment outcome or prognostic value. In the future, it is necessary to combine the long-term follow-up data to explore the optimization of GIST treatment strategy and the construction of prognosis prediction model under the guidance of EUS, such as the establishment of survival prediction scoring system combined with tumor size, location, genotype and other parameters.

Conclusion

This study confirmed that EUS has irreplaceable positioning and qualitative advantages in the diagnosis of gist, and its diagnostic efficiency is significantly better than MSCT. However, it should be noted that EUS has the limitations of operation time and the diagnostic challenges of specific tumor morphology/location. In clinical practice, EUS is preferred for submucosal tumors suspected of GIST; When it is necessary to evaluate the tumor scope, metastasis or complications, it is recommended to combine MSCT. In the future, we need to expand the sample size through prospective multicenter research, combined with multimodal imaging and long-term follow-up to verify the value of EUS.

EUS should be viewed as a complementary rather than replacement tool to MSCT in comprehensive GIST evaluation, optimizing diagnostic efficiency through combined application. These findings guide clinical imaging pathways by prioritizing EUS for initial assessment of suspected submucosal GISTs while reserving MSCT for evaluating tumor extent, metastasis, and complications, forming a sequential diagnostic strategy.

Disclosure

The authors report no conflicts of interest in this work.

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