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Original Article

Diagnostic Accuracy of Ultrasonography in Acute Pancreatitis: A Prospective Validation Using Contrast-Enhanced Computed Tomography as the Reference Standard

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ABSTRACT

Background: Acute pancreatitis is a common cause of acute abdomen associated with considerable morbidity and mortality. Early and accurate diagnosis is essential for timely management and prevention of complications. Ultrasonography (USG) is widely used as the initial imaging modality because of its accessibility and ability to evaluate biliary pathology, whereas contrast-enhanced computed tomography (CECT) provides comprehensive assessment of pancreatic morphology and disease extent.

Objective: To compare the diagnostic performance of transabdominal ultrasonography and contrast-enhanced computed tomography in the diagnosis of acute pancreatitis.

Materials and Methods: A hospital-based cross-sectional observational study was conducted over 18 months in the Department of Radiodiagnosis, Murshidabad Medical College, West Bengal. Eighty-nine patients with clinically suspected acute pancreatitis underwent both transabdominal ultrasonography (index test) and contrast-enhanced computed tomography (reference standard). Demographic characteristics and imaging findings were recorded and analyzed using descriptive statistics and the Chi-square test, with $p<0.05$ considered statistically significant.

Results: The study included 89 patients with a mean age of 30.52 ± 11.36 years, of whom 57.3% were females. On ultrasonography, pancreatic enlargement was observed in 71.9%, ill-defined pancreatic margins in 70.8%, irregular pancreatic morphology in 71.9%, and gallstones in 9.0% of patients. CECT demonstrated diffuse pancreatic enlargement in 51.6%, peripancreatic inflammatory changes in 91.0%, pancreatic necrosis in 42.7%, and positive findings for acute pancreatitis in 92.1% of patients. Ultrasonography diagnosed acute pancreatitis in 71.9% of patients compared with 92.1% by CECT, demonstrating a statistically significant difference ($p = 0.0004$).

Conclusion: Transabdominal ultrasonography remains an appropriate first-line imaging modality in patients with suspected acute pancreatitis because of its accessibility and ability to detect biliary pathology. However, contrast-enhanced computed tomography demonstrated significantly higher diagnostic yield and superior assessment of pancreatic and peripancreatic abnormalities. CECT should therefore be considered whenever ultrasonographic findings are inconclusive or comprehensive evaluation of disease extent and complications is required.

Keywords: *Acute pancreatitis; Ultrasonography; Contrast-enhanced computed tomography; Diagnostic imaging; Pancreatic inflammation.*

INTRODUCTION

Acute pancreatitis (AP) is one of the most common gastrointestinal emergencies worldwide and a leading cause of hospital admission for acute abdominal pain. Its global incidence has steadily increased over recent decades, with reported rates ranging from 13 to 45 cases per 100,000 population annually, largely attributable to the rising prevalence of gallstone disease, alcohol use, obesity, hypertriglyceridaemia, and metabolic disorders (1). Although approximately 80% of patients experience a mild, self-limiting disease course, nearly 20% develop moderately severe or severe acute pancreatitis characterized by persistent organ failure, pancreatic necrosis, systemic inflammatory response, and life-threatening local or systemic complications (1,2). Severe acute pancreatitis continues to be associated with prolonged hospitalization, intensive care utilization, repeated interventions, and mortality rates approaching 20–30% in patients with infected pancreatic necrosis (1). Consequently, early diagnosis and timely assessment of disease severity are essential for optimizing patient outcomes, reducing complications, and improving healthcare resource utilization.

According to the Revised Atlanta Classification, the diagnosis of acute pancreatitis is established when at least two of the following three criteria are present: characteristic abdominal pain, serum amylase or lipase levels exceeding three times the upper limit of normal, and imaging findings consistent with acute pancreatitis (2). While biochemical markers are highly sensitive during the early phase of disease, they correlate poorly with disease severity and may be normal in selected clinical scenarios, including delayed presentation or hypertriglyceridaemia-induced pancreatitis. Furthermore, the clinical manifestations of AP frequently overlap with other causes of acute abdomen, such as acute cholecystitis, perforated peptic ulcer, mesenteric ischaemia, and bowel obstruction. Imaging therefore represents an integral component of patient evaluation, serving not only to confirm the diagnosis but also to determine disease extent, identify the underlying aetiology, assess severity, detect local and vascular complications, and guide therapeutic decision-making. Contemporary management strategies increasingly rely on imaging findings to determine the need for intensive care, image-guided interventions, surgical consultation, and longitudinal follow-up (3; 1).

Transabdominal ultrasonography (USG) remains the recommended first-line imaging modality in patients presenting with suspected acute pancreatitis because of its widespread availability, portability, rapid acquisition, absence of ionizing radiation, and relatively low cost (1). In addition to evaluating pancreatic morphology, ultrasonography is particularly valuable for detecting gallstones, biliary sludge, common bile duct dilatation, and other biliary abnormalities, which account for a substantial proportion of acute pancreatitis cases worldwide. The ability to perform bedside real-time imaging without contrast administration makes ultrasonography especially useful in emergency departments, critically ill patients, pregnant women, and resource-limited healthcare settings. Nevertheless, its diagnostic performance is influenced by several inherent limitations. Visualization of the pancreas is frequently compromised by overlying bowel gas, obesity, abdominal tenderness, or postoperative changes, while the operator-dependent nature of ultrasonography contributes to significant interobserver variability. Consequently, ultrasonography demonstrates reduced sensitivity for detecting early pancreatic inflammation, parenchymal necrosis, retroperitoneal extension of disease, vascular complications, and deep peripancreatic fluid collections, potentially resulting in underestimation of disease severity and delayed recognition of clinically significant complications (3).

Contrast-enhanced computed tomography (CECT) has emerged as the reference imaging modality for comprehensive evaluation of acute pancreatitis because of its superior spatial resolution, reproducibility, and ability to accurately assess both pancreatic and extra-pancreatic abnormalities (4). CECT enables detailed visualization of pancreatic enlargement, parenchymal enhancement, necrosis, peripancreatic inflammatory changes, acute necrotic collections, pseudocysts, walled-off necrosis, haemorrhage, venous thrombosis, pseudoaneurysm formation, pleural effusions, ascites, and retroperitoneal extension of disease. Moreover, CECT forms the basis of validated prognostic scoring systems such as the Modified Computed Tomography Severity Index (MCTSI), which correlates with organ failure, requirement for intervention, duration of hospital stay, and mortality. Current international guidelines therefore recommend CECT in patients with diagnostic uncertainty, failure of clinical improvement after 48–72 hours, or suspicion of local complications, while recognizing it as the reference standard for evaluating the diagnostic performance of alternative imaging modalities (3; 1). Despite the widespread use of ultrasonography as the initial imaging investigation, its reported diagnostic accuracy remains inconsistent across published studies. Variability in sensitivity and specificity has been attributed to differences in patient selection, disease severity, timing of imaging, body habitus, operator expertise, and institutional imaging protocols. In addition, many previous studies have primarily focused on descriptive imaging findings or direct comparisons between imaging modalities rather than rigorous evaluation of diagnostic accuracy. Comprehensive reporting of essential diagnostic performance measures—including sensitivity, specificity, predictive values, confidence intervals, likelihood ratios, and agreement statistics—has frequently been incomplete. Furthermore, relatively few prospective studies have been designed and reported in accordance with the Standards for Reporting Diagnostic Accuracy Studies (STARD 2015), particularly in low- and middle-income countries where ultrasonography often remains the only immediately available imaging modality (5). This lack of standardized prospective evidence limits the generalizability of existing data and hinders evidence-based optimization of imaging pathways in patients with suspected acute pancreatitis.

Given the continued reliance on ultrasonography as the primary imaging investigation in emergency departments and resource-constrained healthcare systems, accurate estimation of its diagnostic validity remains clinically relevant.

Prospective evaluation using standardized imaging protocols and contrast-enhanced computed tomography as the reference standard may provide robust evidence regarding the strengths and limitations of ultrasonography in routine clinical practice. Such evidence may facilitate more rational imaging algorithms, optimize utilization of advanced imaging resources, reduce unnecessary radiation exposure, and minimize delays in diagnosing patients who require early intervention or intensive monitoring.

Therefore, the present prospective diagnostic accuracy study was undertaken to evaluate the diagnostic performance of transabdominal ultrasonography for detecting acute pancreatitis using contrast-enhanced computed tomography as the reference standard. In accordance with the STARD 2015 reporting recommendations, diagnostic validity was assessed.

MATERIALS AND METHODS

This hospital-based cross-sectional observational study was conducted in the Department of Radiodiagnosis, Murshidabad Medical College and Hospital, Berhampore, West Bengal, India, over a period of 18 months. The study comprised 2 months of preparatory work, 12 months of patient recruitment and data collection, followed by 2 months each for data entry and data analysis. The study is reported in accordance with the **Standards for Reporting Diagnostic Accuracy Studies (STARD 2015)** recommendations (5).

Patients presenting with acute abdominal pain and clinically suspected acute pancreatitis who were referred to the Department of Radiodiagnosis for imaging evaluation were enrolled. Each participant underwent **transabdominal** ultrasonography (index test) **followed by** contrast-enhanced computed tomography (reference standard)**, allowing** direct comparison of imaging findings within the same patient.

Inclusion Criteria

- Patients clinically suspected to have acute pancreatitis and referred for imaging evaluation.
- Patients undergoing both the index test and the reference standard.
- Patients willing to participate and providing written informed consent.

Exclusion Criteria

- Pregnant or suspected pregnant women.
- Patients unwilling to participate.
- Patients with a previous history of hypersensitivity to iodinated contrast media, bronchial asthma, or impaired renal function precluding the reference standard examination.
- Patients not diagnosed with acute pancreatitis on either imaging modality.

Sample size was calculated using the formula:

$n=3.84pq/d^2$

where p represented the estimated prevalence (30%), $q = 1 - p$, and d was the allowable error (10%). The calculated sample size was 81 patients. After considering a 10% dropout rate, a total of **89 patients** were included in the study. The prevalence estimate used for sample size calculation was based on previously published literature cited in the thesis.

The study commenced after obtaining approval from the Institutional Ethics Committee. Eligible patients were recruited according to the predefined inclusion and exclusion criteria after obtaining written informed consent. Clinical history and examination findings were obtained from outpatient records or inpatient case sheets, followed by patient interview. Subsequently, all participants underwent the **index test**, followed by the **reference standard**, and imaging findings were recorded using a structured data collection proforma.

The **index test** consisted of transabdominal ultrasonography performed using a **GE LOGIQ P9** ultrasound system equipped with a **1–6 MHz curvilinear transducer**. The pancreas was evaluated for echogenicity (hyperechoic, hypoechoic, or isoechoic), shape, margins, echogenic foci, pancreatic size, peripancreatic fluid collection, and main pancreatic duct diameter. These findings were documented for comparison with the reference standard.

The **reference standard** consisted of contrast-enhanced computed tomography performed using a **Siemens 16-slice CT scanner**. CT examination was undertaken following completion of the index test and was used to evaluate pancreatic parenchymal abnormalities and associated imaging features of pancreatitis. The findings obtained with the reference standard were compared with those of the index test.

The study protocol, patient information sheet, and informed consent form were approved by the Institutional Ethics Committee of Murshidabad Medical College and Hospital before commencement of the study. Written informed consent was obtained from all participants prior to enrolment. Confidentiality and anonymity of patient information were maintained throughout the study, and participants were informed of their right to withdraw at any stage without affecting their medical care.

Data were analysed using standard commercially available statistical software. Continuous variables were expressed as mean ± standard deviation, while categorical variables were summarized as frequencies and percentages. Comparative analysis between the **index test** and the **reference standard** was performed using the Chi-square test and paired *t*-test. Results were presented using tables and charts, and a *p*-value of <0.05 was considered statistically significant.

RESULTS

3.1 Participant Characteristics

A total of 89 patients with clinically suspected acute pancreatitis were included in the study. Females constituted a slight majority of the study population (51/89, 57.3%), while males accounted for 38 (42.7%) patients. Most participants belonged to the 26–43 years age group (45/89, 50.5%), followed by the 8–25 years age group (32/89, 36.0%) and 44–61 years age group (12/89, 13.5%). The mean age of the study population was 30.52 ± 11.36 years. With respect to body mass index (BMI), 40.5% of participants were overweight and 11.2% were obese, with a mean BMI of 24.49 ± 4.07 kg/m², Table 1.

Table 1. Baseline demographic characteristics of the study population.

Characteristic	Category	n (%) / Mean ± SD
Age (years)	Mean ± SD	**30.52 ± 11.36**
	8–25 years	32 (36.0)
	26–43 years	45 (50.5)
	44–61 years	12 (13.5)
Sex	Male	38 (42.7)
	Female	51 (57.3)
Body Mass Index (kg/m²)	Mean ± SD	**24.49 ± 4.07**
	Underweight (<18.5)	8 (9.0)
	Normal (18.5–24.9)	35 (39.3)
	Overweight (25.0–29.9)	36 (40.5)
	Obese (≥30)	10 (11.2)

3.2 Clinical Presentation

Abdominal pain was the most common presenting complaint among patients with suspected acute pancreatitis. Vomiting was reported in **60%** of patients, followed by fever (**56%**), while weight loss was the least common presenting symptom (**14%**). Raised serum amylase levels were more frequently associated with acute pancreatitis, whereas elevated serum lipase levels were observed more commonly in chronic pancreatitis.

3.3 Findings of the Index Test (Transabdominal Ultrasonography)

On ultrasonography (index test), pancreatic enlargement was identified in **64 (71.9%)** patients, while **25 (28.1%)** demonstrated a normal pancreatic size. Ill-defined pancreatic margins were observed in **63 (70.8%)** patients, and echogenic foci were detected in **10 (11.2%)** patients. The remaining ultrasonographic findings, including pancreatic echogenicity, main pancreatic duct diameter, and peripancreatic fluid collections, are summarized in **Table 2**.

Table 2. Ultrasonographic findings in patients with suspected acute pancreatitis.

Ultrasonographic finding	Category	n (%)
Pancreatic size	Enlarged	64 (71.9)
	Normal	25 (28.1)
Pancreatic margin	Ill-defined	63 (70.8)
	Smooth	26 (29.2)
Pancreatic echogenicity	Hyperechoic	19 (21.3)
	Isoechoic	49 (55.1)
	Hypoechoic	21 (23.6)
Pancreatic shape	Irregular	64 (71.9)
	Regular	25 (28.1)
Main pancreatic duct (MPD) diameter	0.5–1.5 mm	20 (22.7)
	1.6–2.5 mm	38 (43.2)
	>2.5 mm	30 (34.1)
	Mean ± SD (mm)	**2.1 ± 0.77**
Gallstones	Present	8 (9.0)
	Absent	81 (91.0)

Overall index test impression	Positive for acute pancreatitis	64 (71.9)
	Negative for acute pancreatitis	25 (28.1)

3.4 Findings of the Reference Standard (Contrast-Enhanced Computed Tomography)

Contrast-enhanced computed tomography (reference standard) demonstrated pancreatic abnormalities in a greater proportion of patients than the index test. The reference standard provided improved visualization of pancreatic morphology, parenchymal changes, ductal abnormalities, calcifications, necrosis, pseudocyst formation, ascites, pleural effusion, and associated complications. Compared with ultrasonography, the reference standard detected pancreatic parenchymal abnormalities in **35 (70%)** patients versus **26 (58%)** by the index test. Similarly, the main pancreatic duct was identified in **10 (20%)** patients on the reference standard compared with **7 (14%)** using the index test, **Table 3.**

Table 3. Contrast-enhanced CT findings.

CT finding	Category	n (%)
Pancreatic enlargement	Diffuse	46 (51.6)
	Focal	36 (40.4)
	Normal	7 (7.9)
Calcific foci	Present	10 (11.2)
	Absent	79 (88.8)
Peripancreatic inflammatory changes	Present	81 (91.0)
	Absent	8 (9.0)
Single acute peripancreatic fluid collection	Present	41 (46.1)
	Absent	48 (53.9)
>2 acute peripancreatic fluid collections	Present	26 (29.2)
	Absent	63 (70.8)
Pancreatic necrosis	Present	38 (42.7)
	Absent	51 (57.3)
Overall reference standard impression	Positive for acute pancreatitis	82 (92.1)
	Negative for acute pancreatitis	7 (7.9)

3.5 Comparison Between the Index Test and Reference Standard

Overall, the reference standard identified acute pancreatitis in **82 of 89 patients (92.1%)**, whereas the index test identified **64 of 89 patients (71.9%)**. A statistically significant difference was observed between the two imaging modalities (p = **0.0004**), indicating superior diagnostic performance of the reference standard in detecting acute pancreatitis.

The reference standard consistently demonstrated superior evaluation of pancreatic parenchyma, ductal anatomy, necrosis, pseudocyst formation, ascites, pleural effusion, and adjacent organ involvement compared with the index test, **Table 4.**

Table 4. Comparison of diagnosis of acute pancreatitis using the index test and reference standard.

Imaging modality	Positive diagnosis, n (%)	Negative diagnosis, n (%)
Index test (Transabdominal ultrasonography)	64 (71.9)	25 (28.1)
Reference standard (Contrast-enhanced CT)	82 (92.1)	7 (7.9)

3.6 Diagnostic Performance of the Index Test

Using the reference standard as the comparator, the sensitivity of transabdominal ultrasonography (index test) for the diagnosis of acute pancreatitis was **73%**, whereas the reference standard demonstrated **100% sensitivity** for visualization and assessment of pancreatic abnormalities. Several patients with negative findings on the index test were subsequently diagnosed with acute pancreatitis on the reference standard, indicating that a negative ultrasonographic examination does not exclude clinically significant pancreatic disease.

DISCUSSION

The present study demonstrated that the index test (transabdominal ultrasonography) diagnosed acute pancreatitis in 71.9% of patients, whereas the reference standard (contrast-enhanced computed tomography) established the diagnosis in 92.1% of patients, with a statistically significant difference between the two modalities (p = 0.0004). These findings indicate that although ultrasonography remains an excellent first-line imaging modality, contrast-enhanced CT provides superior diagnostic yield and a more comprehensive evaluation of pancreatic pathology, particularly when ultrasonographic visualization is limited or disease complications are suspected (1; Arvanitakis et al., 2025).

The lower diagnostic yield of ultrasonography observed in the present study is consistent with the inherent limitations of this modality. Visualization of the pancreas is frequently compromised by overlying bowel gas, obesity, abdominal tenderness and the retroperitoneal location of the pancreas. Consequently, subtle inflammatory changes, pancreatic necrosis

and extra-pancreatic extension may be overlooked during the early stages of disease. In contrast, contrast-enhanced CT provides excellent visualization of both the pancreatic parenchyma and surrounding retroperitoneal structures, allowing accurate assessment of pancreatic enlargement, inflammatory changes, peripancreatic fluid collections, necrosis and vascular complications (1; Arvanitakis et al., 2025).

The findings of the present study are in agreement with current international recommendations. The American College of Gastroenterology (ACG) Clinical Guideline recommends transabdominal ultrasonography as the initial imaging investigation in patients with acute pancreatitis, primarily to identify biliary aetiology, while contrast-enhanced CT should be reserved for patients with diagnostic uncertainty, failure to improve clinically after 48–72 hours, or suspicion of local complications (1). Similarly, the International Association of Pancreatology (IAP) Guidelines recommend that imaging should complement the clinical and biochemical diagnosis, with CT serving as the preferred imaging modality for assessing disease extent, severity and complications when clinically indicated (Arvanitakis et al., 2025).

The CT findings observed in the present study further support the superiority of cross-sectional imaging. Peripancreatic inflammatory changes were identified in 91.0% of patients, diffuse pancreatic enlargement in 51.6%, and pancreatic necrosis in 42.7%. These abnormalities are clinically important because they directly influence severity assessment, prognosis and therapeutic decision-making. Contemporary evidence indicates that contrast-enhanced CT remains the imaging modality of choice for detecting pancreatic necrosis, peripancreatic collections, vascular complications and other local complications that cannot be reliably assessed by ultrasonography (1; 6).

The results of the present study are also supported by previous comparative studies evaluating ultrasonography and CT in acute pancreatitis. Bhowmik et al. (7) demonstrated that CT achieved complete visualization of the pancreas and identified extra-pancreatic complications more reliably than ultrasonography, particularly in patients with excessive bowel gas. Similarly, Talha et al. (8) reported that CT was superior in detecting pancreatic necrosis, peripancreatic inflammatory changes and disease severity, whereas ultrasonography remained valuable as an initial screening modality. Likewise, Chary et al. (9) concluded that CT provided significantly better pancreatic visualization and characterization of local complications, thereby improving diagnostic confidence and disease staging.

However, not all published evidence supports routine CT imaging for every patient with suspected acute pancreatitis. Recent international guidelines emphasize that the diagnosis can often be established on the basis of characteristic abdominal pain together with elevated pancreatic enzyme levels, without the need for immediate CT imaging. Early routine CT has limited impact on management in patients with mild uncomplicated disease and may unnecessarily expose patients to ionizing radiation and intravenous contrast. Therefore, both the ACG and IAP guidelines advocate selective rather than routine use of contrast-enhanced CT, reserving it for diagnostically challenging cases or patients with suspected severe disease and complications (1;6).

The present study therefore supports the complementary use of both imaging modalities rather than considering them competing investigations. Ultrasonography remains an ideal first-line investigation because it is rapid, inexpensive, radiation-free and highly effective in identifying gallstones and biliary obstruction, which remain among the most common causes of acute pancreatitis. Nevertheless, the significantly higher diagnostic yield achieved by contrast-enhanced CT in the present study demonstrates that a negative ultrasonographic examination cannot reliably exclude acute pancreatitis. Patients with persistent clinical suspicion despite negative or equivocal ultrasonographic findings should therefore undergo contrast-enhanced CT to establish the diagnosis accurately and evaluate disease severity and associated complications (1; 6).

Overall, the findings of the present study reinforce current evidence that transabdominal ultrasonography should remain the initial imaging investigation, whereas contrast-enhanced CT should serve as the reference standard whenever ultrasonographic findings are inconclusive or comprehensive assessment of pancreatic and extra-pancreatic disease is required.

CONCLUSION

The present study demonstrated that contrast-enhanced computed tomography was significantly superior to transabdominal ultrasonography in diagnosing acute pancreatitis, identifying positive cases in 92.1% of patients compared with 71.9% by ultrasonography ($p = 0.0004$). In addition to establishing the diagnosis more reliably, CECT provided detailed evaluation of pancreatic enlargement, peripancreatic inflammatory changes, fluid collections and pancreatic necrosis, which are important determinants of disease severity and clinical management.

Despite its lower diagnostic yield, transabdominal ultrasonography remains an indispensable first-line imaging investigation because it is rapid, inexpensive, radiation-free and effective in identifying biliary pathology. However, a negative or equivocal ultrasonographic examination should not exclude the diagnosis of acute pancreatitis in patients with persistent clinical suspicion. In such cases, contrast-enhanced computed tomography should be performed for definitive diagnosis and comprehensive assessment of disease extent and complications.

The findings of this study support the complementary use of ultrasonography and contrast-enhanced CT, with ultrasonography serving as the initial imaging modality and CT functioning as the reference standard for diagnostic confirmation and evaluation of disease severity.

LIMITATIONS

This study has several limitations that should be considered while interpreting the findings. The study was conducted at a single tertiary care centre, which may limit the generalizability of the findings to other healthcare settings. The sample size was relatively small (n = 89), which may have reduced the statistical precision of the observed estimates. The study evaluated imaging findings at a single time point and therefore did not assess changes in imaging appearance during disease progression or treatment. Clinical outcomes, disease severity scores, duration of hospital stay and long-term patient outcomes were not evaluated, precluding assessment of the prognostic value of imaging findings. Although both imaging modalities were performed in all participants, the study focused primarily on diagnostic comparison and did not evaluate interobserver variability or reproducibility of imaging interpretation.

FUTURE DIRECTIONS

Future multicentre studies involving larger and more diverse patient populations are required to validate the present findings and improve their generalizability. Prospective studies incorporating standardized imaging protocols and severity scoring systems may further clarify the role of imaging in risk stratification and prognostication.

Future research should also evaluate the integration of clinical, biochemical and imaging parameters into predictive models for early diagnosis and severity assessment. In addition, advances in imaging technology, including artificial intelligence-assisted image analysis, radiomics and quantitative CT assessment, warrant further investigation to enhance diagnostic accuracy and facilitate individualized management of patients with acute pancreatitis.

Comparative studies evaluating the cost-effectiveness and optimal timing of contrast-enhanced CT following an inconclusive ultrasonographic examination would further help refine evidence-based imaging algorithms for acute pancreatitis.

REFERENCES:

1. Tenner, S., Vege, S.S., Sheth, S.G., et al. (2024) ‘American College of Gastroenterology Guidelines: Management of Acute Pancreatitis’, American Journal of Gastroenterology, 119(3), pp. 419–437.
2. Banks, P.A., Bollen, T.L., Dervenis, C., Gooszen, H.G., Johnson, C.D., Sarr, M.G., Tsiotos, G.G. and Vege, S.S. (2013) ‘Classification of acute pancreatitis—2012: Revision of the Atlanta classification and definitions by international consensus’, Gut, 62(1), pp. 102–111.
3. Expert Panel on Gastrointestinal Imaging (2019) ‘ACR Appropriateness Criteria® Acute Pancreatitis’, Journal of the American College of Radiology, 16(Suppl. 11), pp. S316–S330.
4. Chagas, L.A., Albuquerque, K.S., Soares, L.E., et al. (2025) ‘Beyond the revised Atlanta classification: A comprehensive review of the imaging assessment of acute pancreatitis and its complications’, Abdominal Radiology, 50, pp. 423–437.
5. Bossuyt, P.M., Reitsma, J.B., Bruns, D.E., Gatsonis, C.A., Glasziou, P.P., Irwig, L., Lijmer, J.G., Moher, D., Rennie, D., de Vet, H.C.W. and Kressel, H.Y. (2015) ‘STARD 2015: An updated list of essential items for reporting diagnostic accuracy studies’, BMJ, 351, h5527.
6. Arvanitakis, M., Dumonceau, J.M., Boxhoorn, L., et al. (2025) International Association of Pancreatology (IAP) Guidelines for Acute Pancreatitis. Pancreatology.
7. Bhowmik, P., et al. (2023) ‘Comparative study of ultrasonography and computed tomography for diagnosing acute pancreatitis in a tertiary care centre’, Journal of Family Medicine and Primary Care.
8. Talha, M., et al. (2022) ‘Comparative study of ultrasonography versus computed tomography in evaluation of pancreatitis’, Journal of Clinical and Diagnostic Research.
9. Chary, N., et al. (2021) ‘A comparative analysis between ultrasonography and computed tomography in evaluation of acute pancreatitis’, International Journal of Contemporary Medical Research.