



Research Article

Spectrum of Acute Abdomen Presentations and Determinants of Operative Versus Conservative Management: A Cross-Sectional Observational Study

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ABSTRACT

Background: Acute abdomen is a frequent surgical emergency with a broad etiological spectrum ranging from self-limiting inflammatory conditions to life-threatening perforation, obstruction, and peritonitis. Early distinction between patients requiring operative intervention and those suitable for conservative treatment remains central to reducing delay and improving outcomes.

Objectives: To describe the spectrum of acute abdomen presentations in adults and to identify clinical, laboratory, and imaging determinants associated with operative versus conservative management.

Methods: This cross-sectional observational study was conducted on One hundred consecutive patients presenting with acute abdomen were evaluated using clinical examination, laboratory testing, ultrasonography, plain radiography, and computed tomography when indicated. Etiologies were classified and patients were grouped according to definitive management as operative or conservative. Associations between selected variables and operative management were analyzed using chi-square testing, with $p < 0.05$ considered statistically significant.

Results: Patients aged 31–45 years constituted the largest group, and males predominated. Abdominal pain was universal, followed by nausea or vomiting, fever, and abdominal distension. Acute appendicitis was the leading etiology, followed by acute cholecystitis, intestinal obstruction, and hollow viscus perforation. Ultrasonography was the most frequently used imaging modality. Overall, 62 patients underwent operative management, whereas 38 were managed conservatively. Age above 45 years, fever, leukocytosis, peritonitis signs, and imaging findings suggestive of surgical pathology showed significant association with operative treatment.

Conclusion: Acute appendicitis and biliary disease accounted for a substantial proportion of acute abdomen presentations, while peritonitis signs and radiological evidence strongly influenced the decision for surgery. Integrated clinical assessment supported by targeted imaging remains essential for timely triage and rational management.

Keywords: Acute abdomen; appendicitis; cholecystitis; intestinal obstruction; conservative management; operative management.

INTRODUCTION

Acute abdomen refers to the sudden onset of severe abdominal symptoms that require urgent clinical evaluation to exclude conditions needing immediate intervention. It represents a heterogeneous clinical syndrome rather than a single diagnosis and continues to constitute a major share of emergency surgical workload worldwide [1,2]. The diagnostic challenge lies in the broad differential diagnosis, which includes acute appendicitis, biliary tract disease, intestinal obstruction, perforated

hollow viscus, pancreatitis, renal colic, gastroenteritis, mesenteric ischemia, and selected extra-abdominal causes [1,2,4]. Because the time window for effective treatment can be narrow in patients with peritonitis, ischemia, or sepsis, early risk stratification remains a central component of care [1,4].

Clinical assessment continues to be the first step in evaluating acute abdominal pain. Pain site, chronology, migration, vomiting, fever, bowel symptoms, abdominal distension, guarding, and hemodynamic status help narrow the likely etiology, but bedside assessment alone is often insufficient to establish a definitive diagnosis [2,4]. Laboratory tests, particularly leukocyte count and selected biochemical markers, add diagnostic context but are most valuable when interpreted alongside clinical findings and imaging [2,3]. A substantial proportion of patients presenting with acute abdominal pain ultimately require an interventional or surgical procedure, whereas others improve with antibiotics, fluid resuscitation, bowel rest, analgesia, and close observation [1,4]. Distinguishing these groups at presentation is therefore critical.

Imaging has transformed the work-up of acute abdomen by improving diagnostic accuracy and reducing unnecessary delay. Ultrasonography remains a practical first-line modality in many scenarios, especially for right upper quadrant pain, gynecologic causes, and selected cases of appendicitis, while computed tomography is particularly valuable for lower abdominal pain, intestinal obstruction, perforation, and atypical or equivocal presentations [2,3,6,7,14]. Disease-specific evidence also informs management pathways: appendicitis remains the most common abdominal surgical emergency, early laparoscopic cholecystectomy is standard for most patients with acute cholecystitis, uncomplicated intestinal obstruction can sometimes be managed non-operatively, and most patients with acute pancreatitis are treated conservatively unless complications demand intervention [5,8-13].

Hospital-based studies from different settings have shown that the spectrum of acute abdomen varies with referral patterns, local disease burden, age distribution, and access to imaging and surgery [4,10,11]. In Indian tertiary-care settings, understanding the local pattern of presentation and identifying determinants of operative intervention are useful not only for clinical decision-making but also for optimizing triage, prioritizing imaging, and planning emergency surgical services. However, many studies focus on single diagnoses rather than the full clinical spectrum encountered in routine emergency practice.

The objectives of the present study were to describe the demographic and clinical spectrum of acute abdomen presentations in adults presenting to a tertiary-care hospital, to document the etiological profile and diagnostic investigations used, and to identify determinants associated with operative versus conservative management.

METHODOLOGY

Study design and setting

This hospital-based cross-sectional observational study was conducted in the Department of General Surgery and emergency services at Tirumala Medicover Hospital, Vizianagaram, Andhra Pradesh, from March 2025 to August 2025. The study evaluated the spectrum of acute abdomen presentations and the factors influencing definitive management. Consecutive eligible patients presenting during the study period were enrolled until the sample size of 100 was achieved. The study focused on the initial hospital encounter and the definitive management adopted during the same admission.

Study population and eligibility criteria

The study included adults aged 18 years and above presenting with acute abdominal pain requiring urgent in-hospital evaluation for suspected intra-abdominal pathology. Patients with abdominal trauma, chronic abdominal pain without acute exacerbation, or inadequate data for final etiological classification or management categorization were excluded. A consecutive sampling strategy was used so that the sample reflected the real-world emergency case-mix of the institution.

Clinical and diagnostic assessment

A structured case record form was used to document age, sex, presenting symptoms, duration of illness, examination findings, and provisional diagnosis. All patients underwent routine laboratory testing including complete blood count and additional biochemical tests as clinically indicated. Imaging was selected according to symptom pattern and suspected pathology. Ultrasonography was used as the initial imaging modality in most patients because of its value in biliary disease, appendicitis, and renal pathology [2,3,6]. Plain abdominal radiography was obtained in patients with suspected obstruction or perforation, while computed tomography was reserved for complex, atypical, or equivocal cases and when more precise anatomical delineation was required [2,3,7,14].

Etiological classification and management groups

After review of clinical findings, laboratory results, imaging, operative notes where applicable, and discharge diagnosis, each patient was assigned a final etiological category. These included acute appendicitis, acute cholecystitis, intestinal obstruction, hollow viscus perforation, acute pancreatitis, renal or ureteric colic, acute gastroenteritis, and other causes. Patients were subsequently classified into operative and conservative management groups. Operative management referred to emergency or urgent surgery during the same admission. Conservative management included treatment with intravenous fluids, antibiotics when indicated, analgesics, bowel rest, nasogastric decompression, and close observation without

surgery. Management decisions were made by the treating surgical team on the basis of clinical severity, peritonitis, laboratory derangement, and imaging evidence of surgical disease [1,4,5,8-13].

Statistical analysis

Data were compiled in a spreadsheet and analyzed using standard statistical software. Categorical variables were summarized as frequencies and percentages. The association between selected determinants and operative management was assessed using the chi-square test or Fisher's exact test where appropriate. A p-value of less than 0.05 was considered statistically significant. Findings were presented through tables and descriptive narrative.

RESULTS

The study included 100 patients presenting with acute abdomen during the study period. The results summarize demographic features, presenting symptomatology, etiological spectrum, investigations performed, overall management pattern, and determinants associated with operative treatment.

The baseline demographic profile is shown in Table 1. Patients aged 31–45 years formed the largest age group, followed by those aged 46–60 years. Males constituted 58% of the study population, indicating a modest male predominance in this emergency cohort.

Table 1. Demographic characteristics of the study population (N = 100)

Variable	Category	n	%
Age group (years)	18–30	24	24.0
	31–45	32	32.0
	46–60	26	26.0
	>60	18	18.0
Sex	Male	58	58.0
	Female	42	42.0

The distribution of presenting symptoms is presented in Table 2. Abdominal pain was the universal complaint. Nausea or vomiting was the most frequent accompanying symptom, followed by fever and abdominal distension. Constipation or obstipation was seen particularly in patients with intestinal obstruction and diffuse peritonitis.

Table 2. Presenting symptoms among patients with acute abdomen (N = 100)

Symptom	n	%
Abdominal pain	100	100.0
Nausea/vomiting	68	68.0
Fever	42	42.0
Abdominal distension	34	34.0
Constipation/obstipation	28	28.0
Diarrhea	14	14.0

The etiological spectrum of acute abdomen is summarized in Table 3. Acute appendicitis emerged as the commonest diagnosis, followed by acute cholecystitis and intestinal obstruction. Hollow viscus perforation and acute pancreatitis together accounted for nearly one-fifth of cases, while renal or ureteric colic and acute gastroenteritis formed an important non-operative subgroup.

Table 3. Etiological spectrum of acute abdomen (N = 100)

Etiology	n	%
Acute appendicitis	28	28.0
Acute cholecystitis	16	16.0
Intestinal obstruction	14	14.0

Etiology	n	%
Hollow viscus perforation	12	12.0
Acute pancreatitis	10	10.0
Renal/ureteric colic	8	8.0
Acute gastroenteritis	7	7.0
Other causes	5	5.0

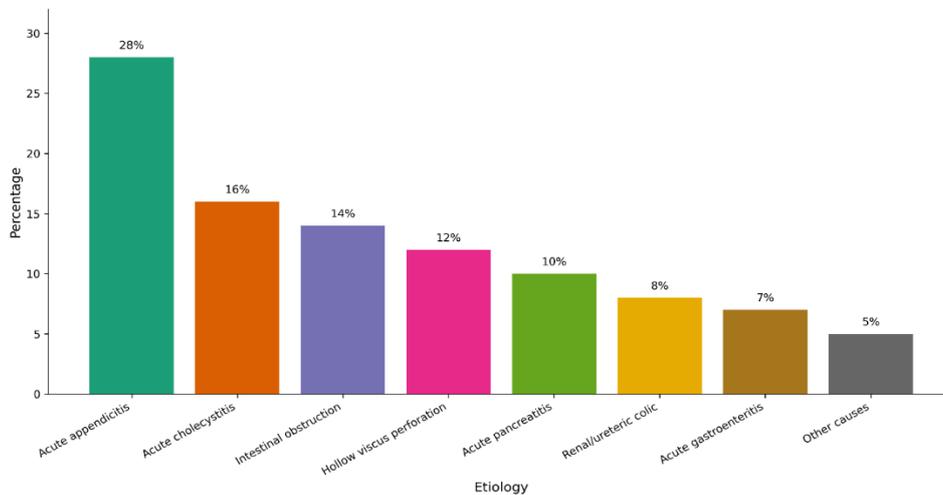


Figure 1: Etiological spectrum of acute abdomen (N = 100)

The investigations contributing to diagnosis are shown in Table 4. Ultrasonography was the most frequently used imaging modality, reflecting its accessibility and value in initial triage. Plain abdominal radiography was mainly used in suspected obstruction or perforation, whereas computed tomography was obtained selectively in patients with atypical presentation or where greater anatomical clarification was necessary.

Table 4. Diagnostic investigations contributing to diagnosis (N = 100)

Investigation	n	%
Ultrasonography abdomen	82	82.0
CT abdomen	28	28.0
Plain abdominal X-ray	34	34.0
Laboratory abnormalities (leukocytosis, raised enzymes)	56	56.0

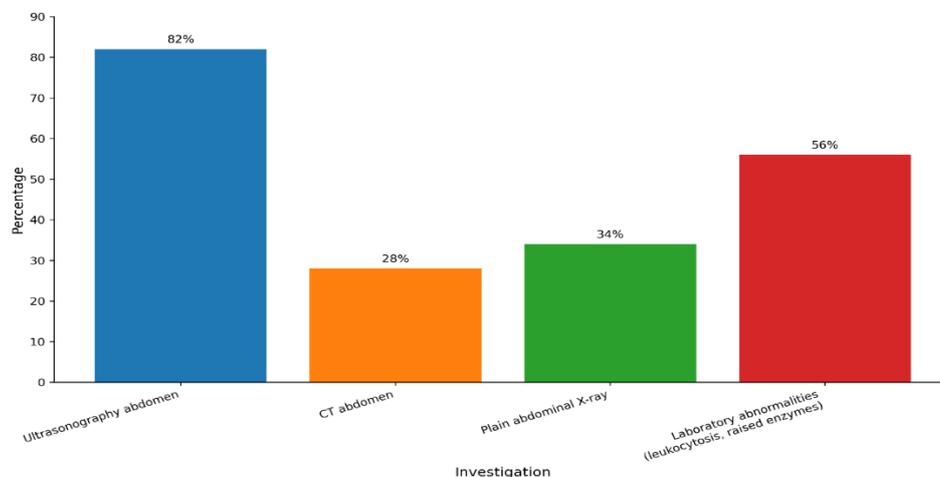


Figure 2: Diagnostic Investigations Contributing to Diagnosis

The overall management pattern is shown in Table 5. A total of 62 patients required operative intervention, while 38 were treated conservatively. Operative management was more common in patients with appendicitis, perforation peritonitis, and selected cases of intestinal obstruction, whereas pancreatitis, renal colic, gastroenteritis, and some less severe inflammatory presentations were generally managed without surgery.

Table 5. Management approach among patients with acute abdomen (N = 100)

Management	n	%
Operative management	62	62.0
Conservative management	38	38.0

The determinants associated with operative management are summarized in Table 6. Age greater than 45 years, fever, leukocytosis, signs of peritonitis, and imaging evidence of surgical pathology were all significantly associated with operative treatment. Among these, imaging suggestive of surgical pathology and clinical peritonitis demonstrated the strongest statistical association with a decision to operate.

Table 6. Determinants associated with operative management (N = 100)

Factor	Operative (n = 62)	Conservative (n = 38)	p-value
Age >45 years	28 (45.2%)	10 (26.3%)	0.04
Fever present	34 (54.8%)	8 (21.1%)	0.002
Leukocytosis	40 (64.5%)	16 (42.1%)	0.03
Peritonitis signs	26 (41.9%)	4 (10.5%)	0.001
Imaging suggestive of surgical pathology	48 (77.4%)	12 (31.6%)	<0.001

DISCUSSION

The present study describes the pattern of acute abdomen in a tertiary-care setting and identifies factors associated with operative intervention. Patients aged 31–45 years formed the largest subgroup, and males showed modest predominance. This broad demographic pattern is comparable to hospital-based reports in which adult working-age groups contribute a large share of acute abdominal admissions, although the exact distribution varies with local case-mix and referral profile [1,2,4,11].

Abdominal pain was universal, while nausea or vomiting, fever, abdominal distension, and constipation or obstipation were common complaints. These findings fit the established clinical description of acute abdomen, where symptom clusters rather than isolated complaints help differentiate inflammatory, obstructive, and perforative disorders [1,2,4]. In our series, fever, leukocytosis, and peritoneal irritation were more frequent among patients who ultimately underwent surgery, underscoring the ongoing importance of careful bedside assessment.

Acute appendicitis was the most frequent etiology, followed by acute cholecystitis and intestinal obstruction. This agrees with the broader literature, which consistently identifies appendicitis as the leading abdominal surgical emergency in adults [1,4,5]. The notable contribution of biliary disease in our cohort also mirrors contemporary evidence showing that acute cholecystitis is a common emergency presentation and that early operative treatment is often appropriate [8,9]. Intestinal obstruction remained another major diagnostic category, in line with previous studies from low- and middle-income settings documenting its substantial contribution to non-traumatic acute abdomen admissions [10,11].

The diagnostic pattern observed in the present study also aligns with contemporary recommendations. Ultrasonography was the most used imaging modality, reflecting its accessibility and usefulness as an initial test in biliary disease, appendicitis, and renal pathology [2,3,6]. Computed tomography was used selectively in difficult or equivocal cases, particularly when surgical pathology was suspected. Published comparative and meta-analytic evidence has shown that CT improves diagnostic accuracy in common causes of acute abdominal pain and performs especially well in adult appendicitis [7,14]. Our findings therefore support a stepwise imaging strategy in which ultrasonography serves as the first-line investigation and CT is used for targeted clarification.

In the present study, 62% of patients underwent operative treatment, whereas 38% were managed conservatively. This distribution is coherent for a tertiary-care surgical cohort. Appendicitis, perforation peritonitis, and selected cases of intestinal obstruction were the principal contributors to surgery, while pancreatitis, renal or ureteric colic, and gastroenteritis were more often treated non-operatively. Disease-specific literature similarly supports surgery for perforation, diffuse peritonitis, and many cases of appendicitis or complicated obstruction, while pancreatitis and selected uncomplicated obstructive or inflammatory conditions are usually managed conservatively [5,10,12,13].

The strongest determinants of operative management in our study were imaging evidence of surgical pathology and clinical signs of peritonitis, followed by fever, leukocytosis, and age above 45 years. These associations are clinically plausible and concordant with literature emphasizing that management decisions in acute abdomen should integrate physical findings, inflammatory markers, and focused imaging rather than rely on symptoms alone [1-4,7,10,14]. These findings support a structured emergency evaluation model that improves triage, facilitates timely surgery in high-risk patients, and avoids unnecessary intervention in those suitable for conservative treatment.

Limitations

This single-center hospital-based study included 100 patients and reflected the case-mix of a tertiary referral center, which limits external generalizability. The cross-sectional design captured in-hospital management decisions but not long-term outcomes, recurrence, or postoperative complications beyond index admission. Disease severity scores and comorbidity-adjusted regression were not incorporated, so residual confounding remained in the assessment of determinants of operative intervention and treatment choice.

CONCLUSION

In this tertiary-care cross-sectional study, acute appendicitis, acute cholecystitis, and intestinal obstruction constituted the major causes of acute abdomen, while abdominal pain, vomiting, fever, and distension were the dominant presenting features. Ultrasonography was the primary diagnostic tool, with computed tomography used selectively for difficult or high-risk cases. Operative management was required in a majority of patients, and the decision to operate was strongly associated with older age, fever, leukocytosis, peritonitis signs, and imaging findings suggestive of surgical pathology. These findings support a structured evaluation model that combines focused clinical assessment with judicious imaging to enable timely triage, rational treatment selection, and more efficient emergency surgical care.

REFERENCES

1. Börner N, Kappenberger AS, Weber S, Scholz F, Kazmierczak P, Werner J. The Acute Abdomen: Structured Diagnosis and Treatment. *Dtsch Arztebl Int.* 2025;122(5):137-144. doi:10.3238/arztebl.m2025.0019.
2. Yew KS, George MK, Allred HB. Acute Abdominal Pain in Adults: Evaluation and Diagnosis. *Am Fam Physician.* 2023;107(6):585-596.
3. Cartwright SL, Knudson MP. Diagnostic imaging of acute abdominal pain in adults. *Am Fam Physician.* 2015;91(7):452-459.
4. Grundmann RT, Petersen M, Lippert H, Meyer F. [The acute (surgical) abdomen - epidemiology, diagnosis and general principles of management]. *Z Gastroenterol.* 2010;48(6):696-706. doi:10.1055/s-0029-1245303.
5. Moris D, Paulson EK, Pappas TN. Diagnosis and Management of Acute Appendicitis in Adults: A Review. *JAMA.* 2021;326(22):2299-2311. doi:10.1001/jama.2021.20502.
6. Karul M, Berliner C, Keller S, Tsui TY, Yamamura J. Imaging of appendicitis in adults. *Rofo.* 2014;186(6):551-558. doi:10.1055/s-0034-1366074.
7. Rud B, Vejborg TS, Rapoport ED, Reitsma JB, Wille-Jørgensen P. Computed tomography for diagnosis of acute appendicitis in adults. *Cochrane Database Syst Rev.* 2019;2019(11):CD009977. doi:10.1002/14651858.CD009977.pub2.
8. Gallaher JR, Charles A. Acute Cholecystitis: A Review. *JAMA.* 2022;327(10):965-975. doi:10.1001/jama.2022.2350.
9. Mencarini L, Vestito A, Zagari RM, Montagnani M. The Diagnosis and Treatment of Acute Cholecystitis: A Comprehensive Narrative Review for a Practical Approach. *J Clin Med.* 2024;13(9):2695. doi:10.3390/jcm13092695.
10. Jackson P, Vigiola Cruz M. Intestinal Obstruction: Evaluation and Management. *Am Fam Physician.* 2018;98(6):362-367.
11. Atalay M, Gebremickael A, Demissie S, Derso Y. Magnitude, pattern and management outcome of intestinal obstruction among non-traumatic acute abdomen surgical admissions in Arba Minch General Hospital, Southern Ethiopia. *BMC Surg.* 2021;21(1):293. doi:10.1186/s12893-021-01294-0.
12. Szatmary P, Grammatikopoulos T, Cai W, Huang W, Mukherjee R, Halloran C, et al. Acute Pancreatitis: Diagnosis and Treatment. *Drugs.* 2022;82(12):1251-1276. doi:10.1007/s40265-022-01766-4.
13. Tenner S, Vege SS, Sheth SG, Sauer B, Yang A, Conwell DL, et al. American College of Gastroenterology Guidelines: Management of Acute Pancreatitis. *Am J Gastroenterol.* 2024;119(3):419-437. doi:10.14309/ajg.0000000000002645.
14. van Randen A, Laméris W, van Es HW, van Heeswijk HPM, van Ramshorst B, Ten Hove W, et al. A comparison of the accuracy of ultrasound and computed tomography in common diagnoses causing acute abdominal pain. *Eur Radiol.* 2011;21(7):1535-1545. doi:10.1007/s00330-011-2087-5.