


# The Role of Imaging in the Management of Acute Non-Traumatic Abdominal Pain at the Amitié Medical Clinic in Kati

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## Abstract

**Introduction:** Acute abdominal pain is pain projected onto the abdomen that has been present for less than a week and occurs outside of any traumatic context. Imaging remains essential for determining the cause. The aim of this study was to evaluate the contribution of imaging in the management of acute non-traumatic abdominal pain at the Amitié de Kati medical clinic. **Methodology:** This was a descriptive cross-sectional study conducted from May 1, 2024, to April 30, 2025. All patients admitted for acute non-traumatic abdominal pain were included. Sampling was consecutive. The anonymity and confidentiality of participants were respected. **Results:** In total, we collected data on 351 patients admitted for acute non-traumatic abdominal pain out of 2,615, representing a frequency of 13.4%. The average age was 23 years, with extremes of 7 months and 92 years. Females predominated (54.7%). Children and/or infants accounted for 51% of patients. Clinical information was dominated by diffuse abdominal pain in 46.4% of cases. Ultrasound was the most commonly requested imaging modality, accounting for 75.8% of cases. The radiological diagnosis was dominated by adenolymphitis in 36.2% of cases, followed by renal colic (18.5%). Medical management was provided in 64.1% of patients. **Conclusion:** Our results show the essential role of imaging in the etiological diagnosis of acute non-traumatic abdominal pain.

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## Keywords

Imaging, Management, Acute Abdominal Pain Non-Traumatic, Mali

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### 1. Introduction

Acute abdominal pain is defined as the onset of pain localized to the abdomen that has developed within the past week [1]. It accounts for approximately 5 to 10% of emergency department admissions worldwide [2]. It is considered non-traumatic when it occurs outside of any traumatic context [3]. It is one of the most common reasons for seeking medical care in children.

However, acute non-traumatic abdominal pain accounts for approximately 20% of daily imaging requests originating from emergency departments [4] and accounts for approximately 30% of all emergency surgeries [3]. Its etiologies are numerous, ranging from digestive to extradigestive causes (primarily ENT, pulmonary, urinary, and gynecological) and from medical to surgical causes [5].

When abdominal pain occurs, its characteristics may lead the clinician to suspect an urgent condition requiring prompt treatment. It is therefore essential to approach it with a rigorous diagnostic process based on history-taking and physical examination, supported by laboratory and imaging tests appropriate to the specific issues at hand [6]. Additional tests remain essential because the causes are varied and the clinical presentation is often unclear and misleading [7].

In the past, the only imaging modality available in the emergency department was an uncontrasted abdominal X-ray (ASP); however, the advent of ultrasound and Computed Tomography (CT) in subsequent years expanded the range of radiological examinations available for acute abdominal syndromes [7]. In particular, computed tomography plays an essential role in the management of non-traumatic abdominal emergencies. It provides detailed images of the intra-abdominal organs and allows for the rapid detection of abnormalities that may be causing the patient's symptoms, with a significant impact on the management of acute abdominal pain [8].

X-rays, ultrasound, Computed Tomography (CT), and Magnetic Resonance Imaging (MRI) each have their own advantages and disadvantages, and they are not always interchangeable. The risks associated with ionizing radiation from CT scans must be taken into account, especially in young patients [9]. Non-ionizing alternatives such as ultrasound or MRI should be preferred if they can provide similar diagnostic information [10].

Ultrasound is safe (no ionizing radiation), inexpensive, readily available, and can be performed frequently, but its accuracy depends more on the operator [11] [12]. MRI, which also does not involve ionizing radiation, has contraindications (such as metallic medical devices and claustrophobia), is relatively expensive, and access to it is often limited [10].

Over the past three decades, the role of radiology has expanded, significantly impacting both diagnosis and treatment decisions for acute non-traumatic abdominal conditions [11]. However, the management of acute, painful, non-traumatic abdominal conditions remains a major concern in our country, despite advances in imaging technology. Given the diagnostic difficulties frequently encountered, it seems important to consider the best strategy to employ, which is why we initiated this study.

The objective of this study was to evaluate the role of imaging in the management of acute non-traumatic abdominal pain at the Amitié Medical Clinic in Kati.

## 2. Methodology

This study was conducted in the medical imaging department of the Amitié Medical Clinic in Kati. The Amitié Medical Clinic is a private facility located in the Koulikoro region, Kati district, in the Luckesy neighborhood.

This was a descriptive cross-sectional study with prospective data collection conducted from May 1, 2024, to April 30, 2025. All patients who requested an examination for acute abdominal pain without a history of trauma were included.

We used consecutive sampling, which involved including patients based on the inclusion criteria until the desired sample size was reached.

Data were collected using a questionnaire and were entered and analyzed using SPSS 25 software.

To perform the examinations, we used a VIVID 7 Dimension ultrasound machine with Doppler capability, equipped with four transducers: a 3.5 MHz transducer, a 7.5 - 10 MHz transducer, an endocavitary transducer, and a cardiac transducer; a PRESTILIX 1600 X bone and lung X-ray machine, and a BRIGH SPEED 16 BARRETTES CT scanner manufactured by Generator Electric.

Participation in the study was voluntary. Consent from a parent or guardian was obtained before the children were included. The anonymity and confidentiality of the participants were respected. The data from this study will be used solely for scientific purposes.

## 3. Results

### 3.1. Frequency

In total, we identified 351 patients admitted for acute non-traumatic abdominal pain out of 2,615 patients referred for imaging, representing a rate of 13.4%.

### 3.2. Socio-Demographic Data

In this study, patients under the age of 10 accounted for 33.6%. The mean age was 23 years, ranging from 7 months to 92 years. Females accounted for 54.7% of cases. Schoolchildren and students accounted for 39.9% of cases. All of these findings are summarized in **Table 1**.

**Table 1.** Distribution of patients by sociodemographic characteristics.

Sociodemographic characteristics sample size	n = 351	%
<b>Age Group</b>		
≤10	118	33.6
11 - 20	34	9.7
21 - 50	123	35.0
>50	76	21.7
<b>Gender</b>		
Female	192	54.7
Male	159	45.3
<b>Marital status</b>		
Married	104	29.6
Single	68	19.4
Child/Infant	179	51.0
<b>Profession</b>		
Student	140	39.9
Housewife	21	6.0
Military	22	6.3
Farmer	53	15.1
Laborer	44	12.5
Teacher	6	1.7
Retired	23	6.6
Merchant	9	2.6
Infant	33	9.4

### 3.3. Clinical Characteristics

The clinical findings were dominated by diffuse abdominal pain in 46.4% of cases. (Table 2)

**Table 2.** Distribution of patients based on clinical information.

Clinical Findings	n	%
Diffuse abdominal pain	163	46.4
Pelvic pain	54	15.4
Abdominal-pelvic pain	67	19.1
Left iliac fossa pain	10	2.8
Right iliac fossa pain	22	6.3
Right flank pain	29	8.3
Periumbilical pain	6	1.7
<b>Total</b>	<b>351</b>	<b>100.0</b>

### 3.4. Radiological Findings

Ultrasound was the most commonly requested imaging modality, accounting for 75.8% of cases. The most common radiological diagnosis was adenolymphitis, found in 36.2% of cases.

In this study, the listed conditions correspond to imaging findings.

Most patients were referred by other healthcare facilities, whose criteria for selecting the imaging modality were not reported in this study. (Table 3)

**Table 3.** Distribution of patients based on imaging data.

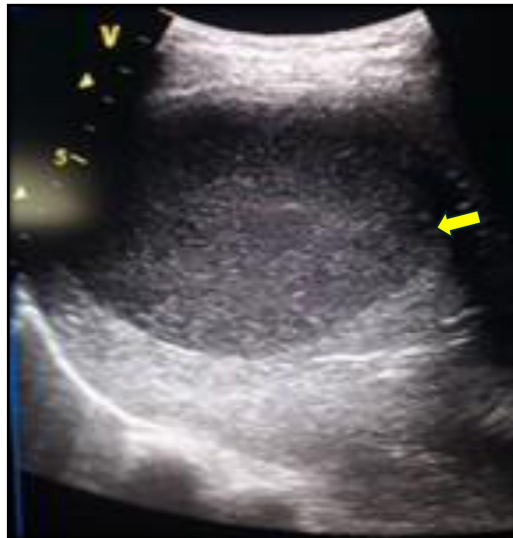
Imaging Data	n = 351	%
<b>Examination Requested</b>		
Ultrasound	266	75.8
Computed Tomography (CT)	22	6.3
Unprepared Abdominal X-ray (ASP)	12	3.4
Ultrasound Combined with ASP	8	2.3
Ultrasound combined with CT	43	12.3
<b>Imaging findings</b>		
Lymphadenitis	127	36.2
Renal colic	65	18.5
Appendicitis	35	10.0
Sigmoiditis	28	8.0
Peritonitis	22	6.3
Intestinal obstruction	20	5.7
Cholangitis	17	4.8
Hemorrhagic ovarian cyst	16	4.6
Ectopic pregnancy (ruptured/unruptured)	11	3.1
Cyst torsion	9	2.6
Angiocholitis	1	0.3

### 3.5. Type of Care

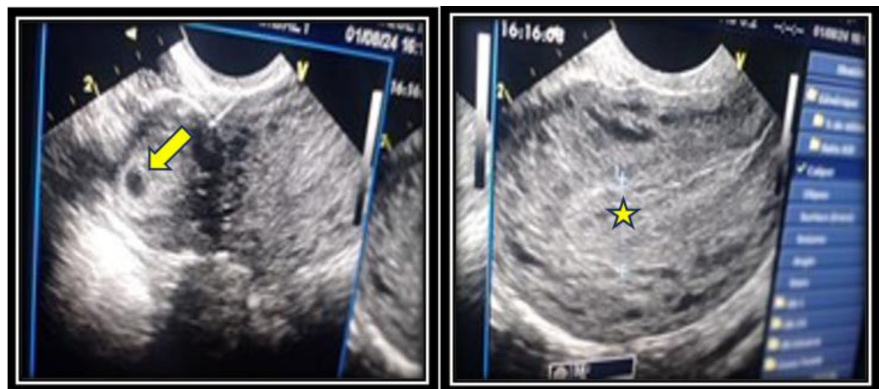
Medical care was provided to 64.1% of patients (Table 4) (Figures 1-5).

**Table 4.** Breakdown of patients by type of care.

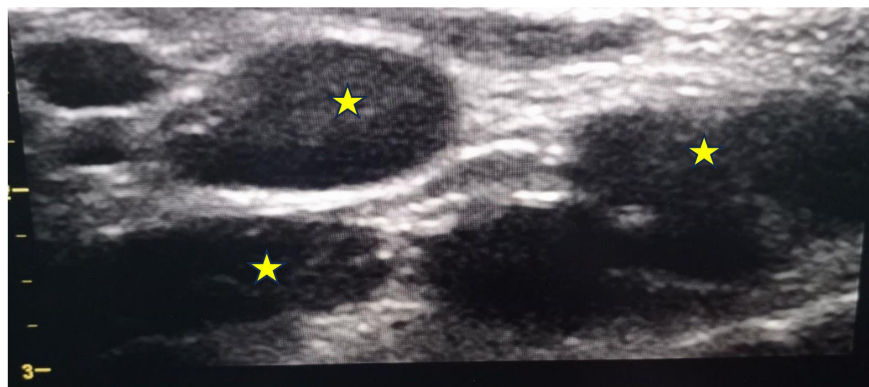
Type of Care	n	%
Medical	225	64.1
Surgical	61	17.4
Mixed	65	18.5
Total	351	100.0



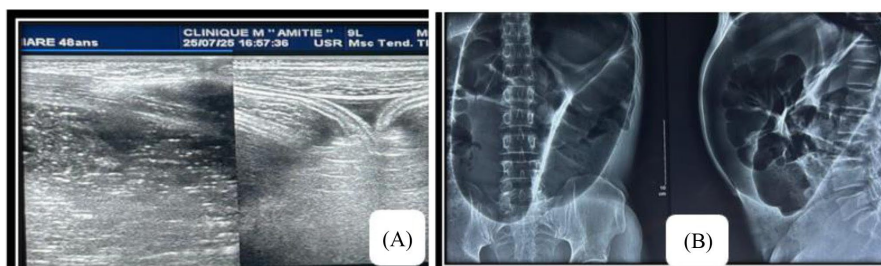
**Figure 1.** A 22-year-old man admitted with right-sided flank pain; an abdominal ultrasound revealed a fluid collection in the liver with a “shifting sand” echogenic pattern suggestive of a liver abscess (yellow arrow).



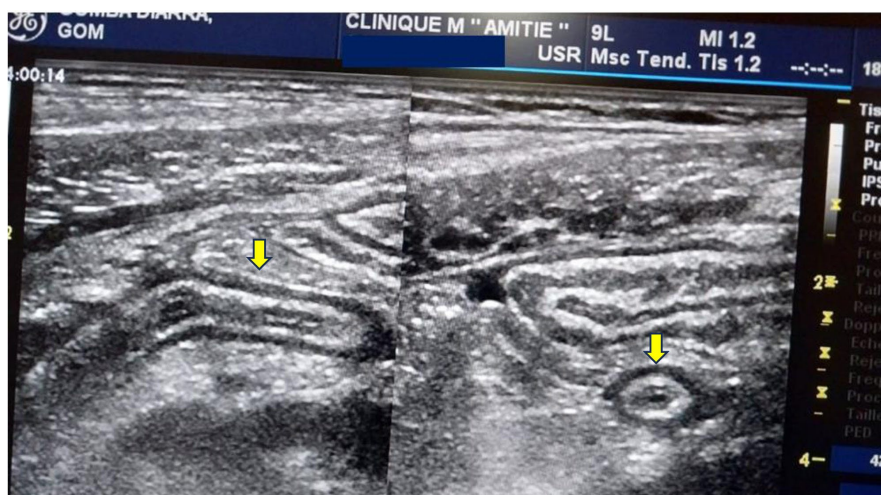
**Figure 2.** A 32-year-old woman presented to the clinic with pelvic pain and a one-month delay in her menstrual period, along with a positive urinary hCG test. An endovaginal ultrasound revealed a right-sided uterine sac consistent with an unruptured ectopic pregnancy (yellow arrow) associated with endometrial thickening of 15 mm (yellow star).



**Figure 3.** A 5-year-old child presented with diffuse abdominal pain; an ultrasound revealed mesenteric lymphadenopathy consistent with adenolymphitis (yellow stars).



**Figure 4.** A 48-year-old patient admitted for diffuse abdominal pain; ultrasound revealed a gas curtain (A). A subsequent CT scan demonstrated coffee-bean-like hyperdensity suggestive of colonic obstruction due to sigmoid volvulus (B).



**Figure 5.** A 56-year-old patient referred for pain in the right iliac fossa, in whom an ultrasound revealed a thick-walled, edematous loop consistent with acute appendicitis.

## 4. Discussion

### 4.1. Frequency

Au total nous avons colligé 351 patients reçu pour douleur abdominale aigue non traumatiques sur 2615 patients orientés vers un examen d'imagerie soit une fréquence de 13.4%. Touré Z. [12], reported a frequency of 4.3% in 2022. This finding underscores the clinical significance of pain in daily practice, particularly due to the wide range of causes it encompasses (gastrointestinal, gynecological, urological, infectious, etc.) and the need for rapid diagnosis to identify potential surgical emergencies.

### 4.2. Sociodemographic Characteristics

In this study, patients under the age of 10 accounted for 33.6%. The mean age was 23 years, with a range of 7 months to 92 years. Deme *et al.* [13] found a predominance of the 20 - 39 age group (35%) with a mean age of 32 years in their 2020 study in Senegal. In the study by Afef *et al.* [14], 55.9% of patients aged 6 - 12 years were reported, with a mean age of 10 years in Senegal. In the study by Bakri E. I. [7] in Morocco, the 46 - 60 age group was the largest, with a mean age of 48.9

years. Chin J. Y. *et al.* [15] found a mean age of 58 years in their 2012 study, which evaluated the utility of abdominal computed tomography in the diagnosis, management, prognosis, and discharge information for patients with acute non-traumatic abdominal pain.

This predominance of pediatric patients in this study could be explained by the high frequency of acute abdominal pain in children, often linked to infectious causes (gastroenteritis, parasitic infections), inflammatory conditions such as mesenteric adenolymphitis, or surgical causes.

We found a clear predominance of female patients, accounting for 54.7% of the total. This finding is consistent with those of Touré Z. [12], and Benaboud M. K. [16], who reported 50.80% and 52.5% of cases, respectively. Chin J. Y. *et al.* [15] reported a prevalence of 69.3% in their 2012 study. Perry H. *et al.* [17] reported that 51.9% of patients were female in their 2016 study on the relative accuracy of emergency computed tomography in adults with non-traumatic abdominal pain.

In our context, this result could be explained, on the one hand, by the fact that women present with specific causes of abdominal pain related to gynecological conditions—such as ectopic pregnancy, complicated ovarian cysts, and genital infections; and on the other hand, certain sociocultural and behavioral factors may influence women's earlier use of healthcare facilities.

### 4.3. Clinical Findings

The clinical findings were dominated by diffuse abdominal pain in 46.4% of cases. This same finding had been reported by Berthé [18], Benaboud M. K. [16], and Touré Z. [12], who noted diffuse abdominal pain in 28.9%, 33.8%, and 39.69% in their studies, respectively. This contrasts with the study by Bakri E. I. [7], who noted a 36% frequency of right lower quadrant pain in his 2023 study in Morocco. Our finding could be explained by the frequency of infectious and inflammatory abdominal conditions, which often present with generalized pain. This highlights the need for a rigorous clinical evaluation and, frequently, the use of additional tests to guide the etiological diagnosis.

### 4.4. Test Requested

In this study, ultrasound was the most frequently requested test, accounting for 75.8% of cases. Similarly, in the study by Touré Z. [12], ultrasound was requested in 84.13% of cases. Amadou *et al.* [19] demonstrated that 95% of physicians prescribe abdominal ultrasound as the first-line test for non-traumatic abdominal emergencies in their study, which examined physicians' choices and motivations in prescribing imaging tests for non-traumatic abdominal emergencies in Togo in 2016. In our context, this proportion of ultrasound requests could be explained by its availability, its non-invasive nature, its speed, its diagnostic effectiveness in certain conditions, and above all its low cost compared to other imaging modalities.

#### 4.5. Imaging Findings

In this study, the most common radiological diagnosis was adenolymphitis in 36.2% of cases. This result differs from that of Touré Z. [12], who reported a predominance of renal colic in 20.62% of cases, followed by mesenteric adenolymphitis in 16.79% of cases in his study. In contrast, Kpossou A. R. [6] in Benin in 2024 and Benaboud M. K. [16] in Morocco in 2018 found 16.5% and 15.5% of acute appendicitis cases, respectively, in their studies. In the study by Berthé I. D. [20], intestinal obstruction was recorded in 44% of cases. Laméris W. *et al.* [21] found acute appendicitis in 28% of patients, followed by acute diverticulitis (12%) and intestinal obstruction in 7% of patients, in their 2009 study on imaging strategies for the detection of urgent conditions in patients presenting with acute abdominal pain. In the study by Chin J. Y. *et al.* [15], the main diagnoses were intestinal obstruction in 8.3% of patients, followed by gastrointestinal perforation (7.5%) and colitis in 6.7% of patients.

The predominance of adenolymphitis in this study could be explained, on the one hand, by the high proportion of children in our study population and, on the other hand, by the frequency of this condition, which often occurs in the context of a viral or bacterial infection.

#### 5. Conclusion

Our results show that imaging is frequently requested for non-traumatic abdominal pain, with most patients being pediatric-aged and female. The most commonly requested test was ultrasound, and the most common diagnosis was lymphadenitis. However, a multicenter study would be necessary to compare data and generalize the results on a national scale.

#### 6. Strengths and Limitations of the Study

The strength of this study is that it is the first of its kind in our context and could help provide an overview of acute non-traumatic abdominal conditions. The limitations of this study include its single-center design, which prevents the generalization of our results to a national scale, and the operator-dependent nature of ultrasound, which has its limitations.

#### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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