

Diagnostic Errors in the General Surgery Department of Ignace Deen National Hospital, Conakry University Hospital

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Abstract

Introduction: Diagnostic errors result from failure to correctly complete one or more steps of the diagnostic process. They may lead to inappropriate treatment, delayed management, complications, and, in severe cases, death. The aim of this study was to report our experience with diagnostic errors in the General Surgery Department of Ignace Deen National Hospital, Conakry University Hospital. **Materials and Methods:** This was a prospective, descriptive study conducted over 18 months, from January 1, 2024, to June 30, 2025, in the General Surgery Department of Ignace Deen National Hospital-Conakry University Hospital. We included all operated patients in whom a discrepancy was identified between the preoperative diagnosis and the definitive diagnosis established during surgery and/or subsequent evaluation. Sociodemographic, clinical, paraclinical, therapeutic, and postoperative variables were analyzed. Data were entered and analyzed using SPSS version 21.0. **Results:** Among 1094 operated patients reviewed during the study period, 36 cases of diagnostic error were identified, corresponding to a frequency of 3.3%. The mean age was 38.3 years (range, 3 - 77 years). There were 21 women (58.3%) and 15 men (41.7%), corresponding to a female-to-male ratio of 1.4. The mean interval between symptom onset and consultation was 20.1 days (range, 5 - 67 days). All patients underwent laboratory investigations. The main imaging examinations performed were abdominopelvic ultrasonography (77.8%), upper gastrointestinal contrast examination (16.7%), upper gastrointestinal endoscopy (30.5%), and abdominopelvic computed tomography (8.3%). Gastric tumor was the most frequent preoperative diagnosis (19.4%). All patients underwent laparotomy. Gastric tumor remained the most frequent intraoperative diagnosis (11.1%). The mean time to treatment was 12.5 days (range, 8 - 26 days).

The postoperative course was uneventful in 31 patients (86.1%), while two patients (5.6%) developed postoperative complications. Three patients died, giving a mortality rate of 8.3%. **Conclusion:** Diagnostic errors remain an important issue in surgical practice in Guinea because of their potential impact on the quality and safety of patient care. Systematic analysis of diagnostic discrepancies, improvement of clinical reasoning, appropriate use and interpretation of complementary investigations, and continuous professional learning may contribute to reducing these errors.

Keywords

Diagnostic Error, General Surgery, Diagnostic Discrepancy, Patient Safety, Conakry University Hospital

1. Introduction

Diagnostic errors result from failure to correctly complete one or more steps in the diagnostic process [1]. In pediatric emergency medicine, diagnostic errors may particularly result from inadequate evaluation of symptoms, omission of diagnostic hypotheses, or underestimation of disease severity [1]. Clinical reasoning is central to medical competence because it enables physicians to formulate, test, and revise diagnostic hypotheses. However, diagnostic reasoning is complex and may involve both analytical and non-analytical processes, with cognitive biases contributing to diagnostic error [2] [3].

Clinical reasoning involves the integration of the patient's history, physical examination, clinical context, and complementary investigations. Diagnosis is therefore inherently associated with a degree of uncertainty, and the interpretation of diagnostic information requires rational evaluation of all available evidence [4]. The interpretation of medical imaging is similarly influenced by visual perception, medical knowledge, experience, and cognitive processes. Diagnostic discrepancies may therefore arise even when complementary investigations have been performed [5].

Diagnostic errors are particularly concerning because some serious diseases can be effectively treated when identified early, whereas diagnostic delay may result in complications or death [1] [6]. Analysis of diagnostic errors is therefore essential to understand their mechanisms and identify strategies for prevention.

In surgery, diagnostic discrepancies may arise from atypical clinical presentations, incomplete clinical assessment, inappropriate or unavailable complementary investigations, misinterpretation of imaging or endoscopic findings, cognitive biases, or delays in referral and management. The diagnostic process may also be affected by organizational factors and communication between healthcare professionals [6].

The aim of this study was to describe our experience with diagnostic errors in the General Surgery Department of Ignace Deen National Hospital, Conakry Uni-

versity Hospital, with particular emphasis on patient characteristics, preoperative investigations, diagnostic discrepancies, treatment, and postoperative outcomes.

2. Materials and Methods

2.1. Study Design and Setting

This was a prospective, descriptive study conducted over an 18-month period, from January 1, 2024, to June 30, 2025, in the General Surgery Department of Ignace Deen National Hospital-Conakry University Hospital, Conakry, Guinea.

2.2. Study Population

The study population consisted of patients admitted to the General Surgery Department and operated on during the study period.

A diagnostic error was operationally defined as a discrepancy between the preoperative diagnosis and the diagnosis established during surgery and/or subsequently confirmed by pathological examination or clinical follow-up. Cases in which the initial diagnosis was revised after operative exploration were considered diagnostic discrepancies.

Patients whose diagnosis remained consistent between the preoperative assessment and the definitive diagnosis were not included among the diagnostic-error cases.

2.3. Data Collection

We prospectively reviewed the medical records of eligible patients. The variables collected included:

- sociodemographic characteristics;
- duration of symptoms before consultation;
- mode of admission;
- clinical findings;
- laboratory and imaging investigations;
- preoperative diagnosis;
- intraoperative diagnosis;
- surgical procedure performed;
- interval between diagnosis and treatment;
- postoperative complications; and
- mortality.

The data were analyzed using SPSS version 21.0. Qualitative variables were expressed as frequencies and percentages, while quantitative variables were summarized by means and ranges.

2.4. Ethical Considerations

The survey was conducted anonymously, and patient confidentiality was respected. Verbal informed consent was obtained from all participants. The study

was approved by the head of the department and the Chair of General and Visceral Surgery.

The authors received no financial support for the research or publication of this study.

3. Results

During the study period, 1094 operated patients were reviewed, among whom 36 cases of diagnostic error were identified, corresponding to a frequency of 3.3%.

3.1. Sociodemographic Characteristics

The mean age of the patients was 38.3 years, with an age range of 3 to 77 years. There were 21 women (58.3%) and 15 men (41.7%), corresponding to a female-to-male ratio of 1.4.

Housewives represented the most frequently reported occupational category, with 13 patients (36.1%).

The mean interval between the onset of symptoms and consultation was 20.1 days, with extremes of 5 and 67 days. Most patients were admitted electively (26 cases, 72.2%).

3.2. Preoperative Investigations

All patients underwent laboratory investigations.

The complementary investigations performed included plain abdominal radiography in 2 patients (5.6%), abdominopelvic ultrasonography in 28 patients (77.8%), upper gastrointestinal contrast examination in 6 patients (16.7%), upper gastrointestinal endoscopy in 11 patients (30.5%), and abdominopelvic computed tomography in 3 patients (8.3%).

The most frequent preoperative diagnosis was gastric tumor, identified in 7 patients (19.4%). The complete distribution of preoperative diagnoses is presented in **Table 1**.

Table 1. Distribution of patients according to preoperative diagnosis.

Preoperative diagnosis	Number	Percentage (%)
Gastric tumor	7	19.4
Acute intestinal obstruction	2	5.5
Liver abscess	4	11.1
Peritonitis during pregnancy	1	2.8
Ovarian tumor	3	8.3
Esophageal cancer	2	5.5
Ulcerative pyloric stenosis	4	11.1
Twisted right ovarian cyst	1	2.8

Continued

Strangulated left inguinoscrotal hernia	1	2.8
Acute appendicitis	5	13.9
Inguinal lymphadenopathy	1	2.8
Pancreatic head tumor	1	2.8
Splenic abscess	2	5.5
Gallbladder cancer	1	2.8
Total	36	100

3.3. Operative Findings and Diagnostic Discrepancies

All patients underwent laparotomy. The intraoperative diagnosis was most frequently gastric tumor, identified in 4 patients (11.1%).

The principal discrepancies between the preoperative and definitive diagnoses are presented in **Table 2**.

Table 2. Distribution of diagnostic discrepancies according to preoperative and definitive diagnoses.

Preoperative diagnosis	Definitive diagnosis	Number	Percentage (%)
Gastric tumor	Transverse stenosis	1	2.8
Gastric tumor	Pancreatic head cancer	2	5.6
Gastric tumor	Pyloric stenosis	2	5.6
Gastric tumor	Splenic abscess	1	2.8
Gastric tumor	Gastric perforation/peritonitis	1	2.8
Splenic abscess	Gastric tumor	4	11.1
Ulcerative pyloric stenosis	Gastric perforation/peritonitis	1	2.8
Liver abscess	Parietal abscess	1	2.8
Liver abscess	Gastric perforation/peritonitis	1	2.8
Liver abscess	Mesenteric cyst	1	2.8
Liver abscess	Liver tumor	1	2.8
Esophageal cancer	Esophageal achalasia	1	2.8
Esophageal cancer	Hiatal hernia	1	2.8
Ulcerative pyloric stenosis	Pancreatic head tumor	1	2.8
Ovarian tumor	Right colon cancer	2	5.6
Ovarian tumor	Sigmoid cancer	1	2.8
Hydatidiform mole	Inguinal lymphadenopathy	1	2.8

Continued

Acute intestinal obstruction	Labor and delivery	1	2.8
Acute intestinal obstruction	Hirschsprung disease	1	2.8
Peritonitis during pregnancy	Ruptured ectopic pregnancy	1	2.8
Acute appendicitis	Psoas abscess	1	2.8
Acute appendicitis	Mesenteric adenolymphadenitis	1	2.8
Acute appendicitis	Appendiceal cancer	1	2.8
Acute appendicitis	Cecal cancer	1	2.8
Acute appendicitis	Right colon cancer	1	2.8
Gallbladder cancer	Gallbladder wall lesion	1	2.8
Twisted right ovarian cyst	Acute appendicitis	1	2.8
Pancreatic tumor	Cholelithiasis	1	2.8
Splenic abscess	Left colonic angle cancer	1	2.8
Endometrial cancer	Uterine fibroid	1	2.8
Total		36	100

Note: The terminology in this table should be checked against the original operative and pathology records before final submission, particularly for abbreviated diagnoses such as gastric perforation/peritonitis and for definitive diagnoses of tumors. Whenever available, histopathological confirmation should be considered the reference standard for malignant diagnoses.

3.4. Treatment and Postoperative Outcomes

The surgical procedure performed was subtotal (4/5) gastrectomy in 4 patients (11.1%) with suspected gastric cancer.

The mean interval between admission and treatment was 12.5 days, with extremes of 8 and 26 days.

The postoperative course was uneventful in 31 patients (86.1%). Two patients (5.6%) developed postoperative complications, specifically surgical-site infection. Three patients died, corresponding to a mortality rate of 8.3%.

4. Discussion

Diagnostic error has historically been considered an unavoidable consequence of medical practice, partly because clinical decision-making occurs under conditions of uncertainty and incomplete information [6]. However, the recognition of diagnostic error as a patient-safety issue has emphasized the need to identify its causes and develop strategies to prevent recurrence.

In our study, 36 diagnostic errors were identified among 1094 operated patients, corresponding to a frequency of 3.3%. This frequency should be interpreted cautiously because our study was conducted in a surgical department and in-

cluded only operated patients. Consequently, it cannot be directly extrapolated to the entire hospital population or to the broader healthcare system.

The mean age of the patients was 38.3 years, with a predominance of women (58.3%). The mean delay between symptom onset and consultation was 20.1 days. This delay may contribute to diagnostic uncertainty because the clinical presentation of disease can evolve over time, particularly in patients who have already received treatment before referral.

Clinical reasoning is a major determinant of diagnostic performance. Physicians may use both analytical and intuitive processes when formulating and evaluating diagnostic hypotheses [2] [3]. In situations characterized by uncertainty, time pressure, incomplete information, or atypical presentations, these processes may be affected by cognitive biases and contextual factors [3] [6].

The most frequent preoperative diagnosis was gastric tumor (19.4%). This finding illustrates the difficulty of distinguishing malignant gastric lesions from other conditions producing similar clinical or radiological features. Among the diagnostic discrepancies identified, several patients initially diagnosed with gastric tumor were found to have pancreatic head cancer, pyloric stenosis, transverse stenosis, splenic abscess, or gastric perforation at definitive assessment. Conversely, four patients initially diagnosed with splenic abscess were found to have gastric tumor. These findings highlight the limitations of relying on a single diagnostic hypothesis when clinical and imaging findings overlap.

Complementary investigations were widely used in our series. Abdominopelvic ultrasonography was performed in 77.8% of patients, upper gastrointestinal endoscopy in 30.5%, upper gastrointestinal contrast examination in 16.7%, and abdominopelvic CT in only 8.3%. The relatively limited use of CT may reflect availability and accessibility constraints in our setting. Nevertheless, additional investigations do not necessarily eliminate diagnostic errors. Diagnostic assessment requires integration of clinical history, physical examination, clinical context, and complementary investigations [4].

Imaging interpretation is particularly susceptible to diagnostic error. Diagnostic discrepancies may result from perceptual errors, cognitive errors, system-related factors, or combinations of these mechanisms [5]. In a study of diagnostic errors in pediatric radiology, errors were frequently multifactorial and involved both cognitive and perceptual mechanisms [5]. Similarly, Bruno *et al.* emphasized that medical imaging is an important component of the diagnostic process and that errors may result from failures in interpretation, perception, and cognitive processing [7].

In our series, some diagnostic discrepancies involved diagnoses that were strongly dependent on imaging or endoscopic interpretation. These findings emphasize the importance of communication between surgeons, radiologists, endoscopists, pathologists, and other specialists. The availability of an imaging examination alone is not sufficient if the examination is not appropriately interpreted or integrated with the clinical context [5] [7].

Diagnostic errors are not restricted to rare diseases. Common diseases may also be misdiagnosed when their clinical manifestations are atypical or modified by previous treatment [1] [6]. This phenomenon may explain some of the discrepancies observed in our study, including patients initially diagnosed with acute appendicitis who were ultimately found to have psoas abscess, mesenteric adenolymphadenitis, or malignant lesions of the appendix, cecum, or right colon.

The causes of diagnostic errors are multifactorial. They may involve clinical assessment, cognitive biases, interpretation of complementary investigations, communication problems, insufficient access to diagnostic tools, or delays in referral. In emergency medicine, diagnostic errors have been associated with both cognitive and systemic factors, including communication and teamwork [6]. Marqué *et al.* also demonstrated that diagnostic error in emergency medicine can be analyzed as a complex interaction between cognitive processes and the characteristics of the work situation [8].

The consequences of diagnostic error can be serious, particularly in surgical patients. In our series, the mean delay to treatment was 12.5 days, and three patients died. Although the present study cannot establish a causal relationship between diagnostic error and mortality, these outcomes demonstrate the potential clinical consequences of diagnostic uncertainty and delayed definitive management.

The analysis of diagnostic errors can therefore be approached at several levels, including the clinical situation, the diagnostic task, and the cognitive processes involved in decision-making [8]. Situational factors may include workload, time pressure, availability of diagnostic tests, and referral delays. At the task level, errors may occur during data collection, formulation of diagnostic hypotheses, interpretation of examinations, or reassessment of an initial diagnosis. At the cognitive level, premature closure, anchoring, confirmation bias, or inappropriate pattern recognition may contribute to diagnostic error [2] [3] [6].

Our findings support the need for a non-punitive approach to diagnostic error. The objective should not be to assign blame but to understand how and why an error occurred and to implement corrective measures. Regular multidisciplinary case reviews, improved access to appropriate imaging and endoscopy, better communication between clinicians and radiologists, and systematic reassessment of discordant clinical findings may help reduce diagnostic errors.

5. Limitations

This study has several limitations. First, it was conducted in a single surgical department and therefore may not be representative of other hospitals or surgical services in Guinea. Second, only operated patients were included, meaning that diagnostic errors managed non-operatively or in other departments were not captured. Third, the study was descriptive and did not allow us to determine the independent factors associated with diagnostic error or mortality. Finally, some definitive diagnoses, particularly those involving tumors, should ideally be con-

firmed by histopathological examination and documented follow-up. These limitations should be considered when interpreting our findings.

6. Conclusions

Diagnostic errors remain an important issue in surgical practice in Guinea because of their potential impact on the quality and safety of patient care. In our series, diagnostic discrepancies involved a wide range of gastrointestinal, hepatobiliary, gynecological, and abdominal conditions. Gastric tumor was the most frequent preoperative diagnosis, while several patients were ultimately found to have other surgical or malignant conditions.

Diagnostic errors result from complex interactions between clinical reasoning, interpretation of complementary investigations, access to diagnostic resources, and organizational factors. Their prevention should not rely primarily on sanctions. Instead, errors should be analyzed in a non-punitive manner to identify their causes and implement corrective measures.

Continuous clinical training, systematic reassessment of discordant findings, improved access to appropriate diagnostic investigations, multidisciplinary collaboration, and learning from previous errors are essential to improve patient safety and surgical outcomes.

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The authors received no financial support for the research or publication of this study.

Ethical Approval and Consent

The study was conducted anonymously, and confidentiality was respected. Verbal informed consent was obtained from all participants. The study was approved by the head of the department and the Chair of General and Visceral Surgery.

Author Contributions

All authors contributed to the conception, data collection, analysis, interpretation of the results, and preparation and revision of the manuscript. All authors approved the final version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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