

## Original Research Article

## Management of Abdominal Surgical Emergencies at the General Reference Hospital, What Place for Laparoscopic Surgery?

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**Abstract:** *Aim of the study:* The purpose of this article is to report the experience of the General Reference Hospital in the surgical management of abdominal emergencies. *Patients and Methods:* This was a prospective study over 3 years 5 months (08/12/2017 to 31/05/2021) which concerned patients operated for an abdominal emergency at the General Reference Hospital of Niamey. *Results:* We had 170 patients operated for an abdominal emergency (8.37%), with a male predominance (61.50%) and a sex ratio of 1.59. The average age was 36.08 years with a standard deviation of 17.46 and extremes of 2 to 79 years. Non-traumatic abdominal emergencies dominated with 96.47%. Abdominal ultrasound was performed in 92.35% (n=157) of patients and abdominal CT scan in 35.88% (n=61). General anesthesia was performed in 97.06% of cases (n=165). The approaches were laparotomy in 72.35% (n=123) and laparoscopy in 27.65% (n=47). The most reported intraoperative diagnoses were acute appendicitis 40.59% (n=69) followed by acute peritonitis 18.82% (n= 32) and acute cholecystitis 13,53% (n= 23). The main procedures performed by laparoscopy were appendectomies, cholecystectomies and acute peritonitis in respectively 15.29%, 10.59% and 1.76% of cases. Postoperative complications represented 2.35% (n=4) in laparoscopy and 9.41% (n=16) in laparotomy. *Conclusion:* Abdominal emergencies at the Reference General Hospital are frequent and postoperative complications are few especially at laparoscopy, which is a first way to encourage in our context; It gives better surgical outcomes than conventional surgery.

**Keywords:** Abdominal emergencies, laparoscopy, Reference General Hospital Niamey.

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## INTRODUCTION

According to the WHO, an abdominal surgical emergency is defined as abdominal pain evolving for a few hours or even a few days (less than 3 days) and which is related to a surgical pathology [1]. These are conditions requiring rapid surgical treatment. Surgical pathologies occupy an important place in medicine due to their frequency, their treatment, their mortality rates and their psychological impact [2]. Their etiologies are multiple. The prognosis of surgical emergencies depends on the time taken for treatment. It remains gloomy according to the literature, with a high mortality rate of around 4.7 to 9.7% and a morbidity rate of 12.6 to 22% [3, 4].

The management of these emergencies is increasingly done by minimally invasive way while respecting the indications. The General Reference

Hospital (HGR) being a new third level hospital structure which had just opened its doors, we propose to report our experience in the management of surgical abdominal emergencies and especially by laparoscopy.

## PATIENTS AND METHODS

This was a prospective and descriptive study over 3 years 5 months (08/12/2017 to 31/05/2021) which concerned patients operated for an abdominal surgical emergency at the General Reference Hospital of Niamey. Were included all patients operated on at the same time, for a traumatic and non-traumatic abdominal emergency, without age limitation. The non-inclusion criteria concerned patients undergoing emergency surgery in another hospital and transferred to the HGR. Depending on the indication and/or the surgeons, the patients were operated either by laparotomy or laparoscopy. These indications for

laparoscopy applied to patients who are not in a state of septic or hemodynamic shock, who have not been operated on multiple times and who are over 10 years of age. The parameters studied were epidemiological, clinical, paraclinical, therapeutic, evolutionary factors and postoperative complications.

## RESULTS

During the study period, 2,030 patients had been operated on at the HGR, all urgent and non-urgent pathologies combined, including 170 cases of abdominal surgical emergencies i.e. an overall frequency of 8.37%. The male gender predominated with 61.50% (n=105), i.e. a sex ratio of 1.59, the mean age was 36.08 years with a standard deviation of 17.46 and extremes of 2 years and 79 years old. The age group of 16 to 30 years represented 40% (n=68). Majority of patients, 82.35% (n=140) came from the urban commune of Niamey. Hypertension was the antecedent and the most represented comorbidity factor with 19.41% (n=33) and 9 patients (5.29%) had undergone hernia surgery including 2 cases of umbilical hernia. It was noted that 97.65% (n=166) of patients were admitted in emergencies and the rest of the patients 2.35% (n=4) were reoperations in emergency for complications. According to the WHO general condition classification, 78.82% of patients (n=134) were WHO 0 and 5.29% (n=9) were in septic shock at initial clinical examination. Abdominal pain was the most found functional sign, i.e., 84.12% (n=143) followed by fever in 80.59% (n=137). Analysis of the complete blood count noted that 57.65% (n=98) of the patients had hyperleukocytosis and the hemoglobin level was normal in 83.53% of the patients (n=142). Most patients, 88.23% (n=150), had a positive CRP. Renal function was impaired in 16.47% of patients (n=28). Abdominal ultrasound was the most performed imaging examination with a frequency of 92.35% (n=157) followed by injected abdominopelvic CT scan

in 35.88% (n=61). Non-traumatic surgical abdominal emergencies accounted for 96.47% of cases (n=164) and traumatic 3.53% (n=6) including 3 cases of stab trauma. Among patients reoperating (table I), peritonitis accounted 1.18% (n=2). During the pre-anesthetic evaluation, there were 64.12% of patients classified as ASA 1 (n=109). General anesthesia was performed in 97.06% of patients (n=165). The most reported intraoperative diagnoses were acute appendicitis 40.59% (n=69) followed by acute peritonitis 18.82% (n= 32) and acute cholecystitis 13.53% (n= 23) (table II). Laparoscopy was performed in 27.65% of cases (n=47) including appendectomy in 15.29% (n=26), cholecystectomy in 10.59% (n=18) of cases and peritonitis by gastric perforation in 1.76% of cases (n=3). There was one case of laparotomy conversion due to surgical washing difficulty for generalized acute peritonitis. There were 16.47% of patients who had benefited postoperative preventive treatment for thromboembolic risk, with Enoxaparin. The average operative time in laparotomy was 98 minutes and 102.5 minutes in laparoscopy. The complication rate was 11.76% (n=20) with 4 cases in laparoscopy (2.35%) and 16 cases (9.41%) after laparotomy (Table III). In laparotomy, wound infection was the most common peri-operative complication in 3.52% (n=6) of cases (Clavien-Dindo IIIa), followed by parietal hematoma in 1.76% (n=3) of cases (Clavien-Dindo IIIa) and evisceration in 1.17% (n=2) of cases (Clavien-Dindo IIIb). Post-operative laparoscopic complications were trocar orifice infection in 1.76% (n=3) related to the management of appendicular abscess and parietal hematoma in 0.59% of cases (n=1). The hospitalization time was less than 7 days for more than half of the patients operated by laparotomy 52.84% (n=65) and 3 days for those operated by laparoscopy in 70.21% of cases (n=33). Mortality was 2.35% (n=4) and related to acute peritonitis operated by laparotomy in 3 cases (Clavien-Dindo V).

**Table I: Distribution of patients according to the different types of post-operative secondary emergencies**

Secondary emergencies	Frequency	Rate %
Postoperative peritonitis	2	1,18
Acute necrotizing pancreatitis	1	0,59
Hemorrhage after laparoscopic cholecystectomy	1	0,59

**Table II: Distribution of patients according to intraoperative diagnosis**

Mecanism	Diagnosis	Frequency	Rate %
<b>Appendicitis</b>	Acute appendicitis	44	25,88
	Appendicular abscess	25	14,71
<b>Acute peritonitis</b>	Appendiceal perforation	13	7,65
	Ileal perforation	9	5,29
	Duodenal gastro perforation	7	4,12
	Caecal perforation	3	1,76
<b>Acute cholecystitis</b>	Thick wall	18	10,59
	Normal wall	5	2,94
<b>Bowel obstruction</b>	On intussusception	4	2,35
	On flanges	9	5,29
	On right colon tumor	2	1,18

Mecanism	Diagnosis	Frequency	Rate %
	On transverse colon tumor	1	0,59
	On volvulus of the sigmoid	5	2,94
<b>Strangled umbilical hernia</b>	Without necrosis	17	10,00
	With necrosis	2	1,18
<b>Plaies perforantes</b>	Liver wound	1	0,59
	Caecum wound	1	0,59
	Right kidney wound	1	0,59
	Diaphragmatic rupture	1	0,59
	Fecal peritonitis	1	0,59
	Vesical, rectal, ileal wound	1	0,59
<b>Total</b>		170	100

**Table III: Distribution of patients by type of post-operative laparotomy complications**

Complications		Frequency	Rate (%)
<b>Perioperative</b>	Wound infection	6	3,52
	Parietal hematoma	3	1,76
	Eviscerate	2	1,17
<b>Medium term</b>	Eventration	5	2,94
<b>Total</b>		16	9,41

## DISCUSSION

The HGR is a 3rd level hospital which serves as a reference for other hospitals of the same level; it was in its fifth year of operation when the study was conducted. It is a little out of the city; access is recently tarmacked to facilitate its attendance. We wanted to highlight the experience of this new structure in the management of abdominal surgical emergencies.

Abdominal surgical emergencies represent a large part of surgical activity. They can be extremely urgent and put the patient's life at stake in hours or even minutes. They are grouped into traumatic and non-traumatic emergencies.

Abdominal surgical emergencies constituted 8.37% of all urgent surgical activities at the HGR during the period of our study. This result is higher than that of Abdou Labo M. [5] in 2020 at the Niamey National Hospital (HNN) which reported a rate of 3.94% but identical to those of Sogan A. in Togo [6] who reported 10.56% in their series. But the two studies only concerned non-traumatic abdominal emergencies, unlike ours, which took into account traumatic and non-traumatic abdominal emergencies.

There was a male predominance with 61.50% and a sex ratio of 1.59, this is practically the case of the Camara M study [7] in Guinea which had reported a sex ratio of 1.8. The average age of our patients was 36 years old and the age group from 16 to 30 years old was the most represented with 40%. This is in line with the analysis of Harouna Y et al [8] in Niger who estimated that in Africa, overall digestive surgical emergencies concern young adult males. This could be explained by the fact that men are more exposed to accidents, trauma and/or digestive infections.

Abdominal pain was the main functional sign found in the majority of our patients, ie 84.12%, followed by fever in 80.59% of cases. These results are superimposed on those reported by Chaïbou MS [9] in Niger with 98.4% of cases. Indeed, pain is the main symptom of abdominal surgical emergencies.

Abdominopelvic ultrasound was the most frequently performed examination (92.35%). Our results were superior to those reported by Ibrahima G [10] in Senegal with 54.15%. Ultrasound is an easily accessible, less expensive, and non-irradiating examination; but it is ineffective in case of suspected intestinal obstruction because of the digestive gases which form a barrier to its reading. However, the abdomino-pelvic CT scan injected with contrast product remains the most efficient examination, it was performed in 61 patients, i.e. 35.88%. This result is higher than that reported by Abdou Labo M [5] in Niger with 1.4%. The CT scan is an essential and recommended examination in case of acute abdominal pain in an adult in the emergency room. It is easily accessible in our establishment, but it is an expensive examination, and which takes more time to carry out.

Non-traumatic surgical abdominal emergencies were more frequent, i.e., 96.47% against 3.53% of traumatic abdominal emergencies. Our results are similar to those reported by Harouna Y [8] in Niger, and those of Sogan A. in Togo [6] with 90.11% and 91.05% respectively of non-traumatic surgical abdominal emergencies. This could be explained by the resurgence of digestive infections in our context, in particular infections linked to typhoid fever and the digestive complications they cause. The search for the etiologies of non-traumatic ileal perforations could not be determined in our study by the lack of emergency blood culture and/or stool culture. These examinations

are very expensive and above all are not carried out in an emergency (coproculture).

Acute appendicitis was at the forefront of non-traumatic abdominal emergency conditions reported, with 40.59%, followed by acute peritonitis in 18.82%; our results are similar to those of Camara M [7] in Guinea, who found 38.04% of acute appendicitis and 15.22% of acute peritonitis. On the other hand, in certain African series, acute appendicitis had occupied the 3rd rank, reported by Zaré C [11] in Burkina Faso and Ibrahim G [10] in Senegal. A study in two hospitals in Douala, Cameroon reported first-order bowel obstruction, followed by acute appendicitis and acute peritonitis, respectively in 32%, 24.6% and 22.7% of cases [12].

Once the diagnosis has been made, the therapeutic approach is based first on preoperative resuscitation to maintain vital functions, then surgery. General anesthesia was practiced in almost all patients, i.e., 97.06%; Our results are well above those of Touré A [10] in Mali and Faboye N [13] in Senegal with 32.9% and 51.2% respectively.

In our study, the approach was represented in 72.35% by laparotomy, and in 27.65% of cases by laparoscopy. The latter allows a complete exploration of the abdominal cavity by a minimally invasive approach, it also makes it possible to rectify the diagnosis in case of doubt in certain patients [14].

The most common surgical procedures performed by laparoscopy were appendectomy, cholecystectomy, and gastric perforation peritonitis in 15.29%, 10.59% and 1.76% of cases, respectively. The Tokyo Guidelines published in 2007 [15] concluded that it was preferable to perform cholecystectomy early in case of lithiasic acute cholecystitis (grade A recommendation). Our results are different from those of Samake N [16] in Mali who reported 35.2% for cholecystectomy in the foreground and 27.9% for appendectomy. Laparoscopic surgery is increasingly used as a minimally invasive approach in abdominal emergency surgery, especially in young and/or obese patients. It sometimes represents a means of diagnosis, or of differential diagnosis [14]. The poor general condition of patients with generalized peritonitis does not allow them to be managed by this route, which will prolong the operative time and, above all, washing the abdominal cavity remains difficult and ineffective in laparoscopy, responsible for the known postoperative abscesses [17]. This was the case with the cause of our conversion to laparotomy.

We noted 16.47% of our patients who had benefited from postoperative preventive anticoagulation made of Enoxaparin. Abdou Labo M [5] in Niger had reported a lower rate with only 0.2% of patients in her series of non traumatic abdominal surgical emergencies.

The average duration of hospitalization in our series was 7 days for laparotomy, similar in the series of Camara M [7] in Guinea which reported 7, 5 days. While for laparoscopy it was less than 3 days. Our result is similar to that reported by Samake N [16] in Mali which was 2 days. This short duration of hospitalization could be explained by the higher frequency of minimally invasive surgery in our series. This is one of the recognized qualities of minimally invasive surgery in the literature [14].

The reported a complications rate of 11.76%. These results are much lower than those of Camara M [7] in Guinea who had recorded 33.4% of complications dominated by parietal suppurations; certainly, thanks to our not negligible rate of laparoscopy which had generated few complications.

We reported an overall mortality of 2.35% for 4 cases of death. This result is lower than that of Zaré C [11] in Burkina Faso, which reported a rate of 8.7%. On the other hand, Harissou A *et al.*, [18], in their study on the diagnostic delay in the management of digestive emergencies at the national hospital of Zinder in Niger, had found a higher result with a rate of 12% and Harouna Y *et al.*, [8], still in Niger at the HNN, found a rate of 14.8%. This can be explained by a better technical platform at the HGR which is the national reference center in Niger.

## CONCLUSION

Urgent surgical abdominal pathologies occupy an important place due to their urgency, frequency and severity; most patients were seen urgently in a context of abdominal pain and fever. Young male subjects constituted most of our patients and infectious non-traumatic emergencies were the most represented. The well-conducted clinical examination, the realization of medical imaging, the adequate resuscitation allows to obtain a better result. Laparoscopy is a promising approach in our context with a better postoperative course than conventional surgery.

The enhancement of the technical platform, the introduction of video surgery in the continuous training of surgeons in Niger could improve the management of urgent abdominal pathologies.

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