

## Indications and Outcomes of Laparoscopic Surgery in Pikine Hospital (Senegal): Retrospective Study of 65 Cases Reports

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### Abstract

**Introduction:** Laparoscopy or laparoscopy is a modern surgical approach that has seen its indications broaden daily in digestive and gynecological surgery. It has many advantages, but its practice requires a constant learning curve. The aim of our work was to evaluate the indications and results of laparoscopy in the surgical department of the hospital of Pikine (Senegal).

**Materials and Methods:** This was a retrospective cross-sectional study over 3 years from May 2017 to May 2020 that included all the files of patients operated on in general surgery by laparoscopic route, regardless of age and indication. We studied the epidemiological data, the diagnoses, the procedures carried out, the incidents and conversions as well as the operative consequences.

**Results:** We collected 65 files, or 3.2% of abdominal surgeries during our study period. The average age was 44 years with extremes of 8 years and 84 years. The sex ratio was 0.32, of which 49 cases (75.3%) were female. Sixty-two patients (95.3%) were operated on in a regulated program. Laparoscopy was for therapeutic purposes in 59 cases (90.7%). Biliary pathologies were the most frequent with 55 cases (84.6%) dominated by symptomatic gallstones (n = 49 or 75.3%) followed by appendicular pathologies with 6 cases (9.2%). Three cases (4.7%) of intraoperative diagnostic recovery were reported. Retrograde cholecystectomy was the most performed procedure in 55 (84.6%) followed by appendectomy in 6 cases (9.2%). Seven cases (10.7%) of intraoperative incidents were noted, including 3 cases of vesicular breach and one case of a wound of the esophageal mucosa. Conversion to laparotomy was performed in 2 patients (3.2%) following a splenic wound and a locally advanced tumor of the colon. Morbidity was 6.1% (n = 4) including 2 cases of suppuration through a trocar opening. Two deaths were noted following tare decompensation.

**Conclusion:** Despite the limited experience and technical platform, laparoscopy continues to gain space in daily practice in our contexts. A rigorous learning curve would be essential to broaden the indications and improve the postoperative course.

**Keywords:** Laparoscopy; Coelioscopy; Cholecystectomy; Conversion; Appendicectomy; Pneumoperitonea

**Introduction**

Born and first developed in gynecology, laparoscopy has revolutionized all fields of surgery by introducing the concept of minimally invasive surgery. His advent challenged the old adage “big incisions, big surgeons” [1]. Its many advantages (minimally invasive nature, reduction in post-operative morbidity, aesthetic benefit, magnified vision of the operating field, precision and efficiency of surgical procedures, respect for anatomy and physiology) quickly made it a cornerstone in abdominopelvic surgery [2]. After its introduction in Senegal in the 90s, laparoscopy has been performed in the surgery department of the Pikine National Hospital Center since May 16, 2017 for diagnostic and therapeutic purposes [3]. Since then, its practice has become more and more constant and its indications have been steadily expanding. We deemed it necessary to take stock of the epidemiological aspects but also to report the indications and results of laparoscopy in this level 3 hospital.

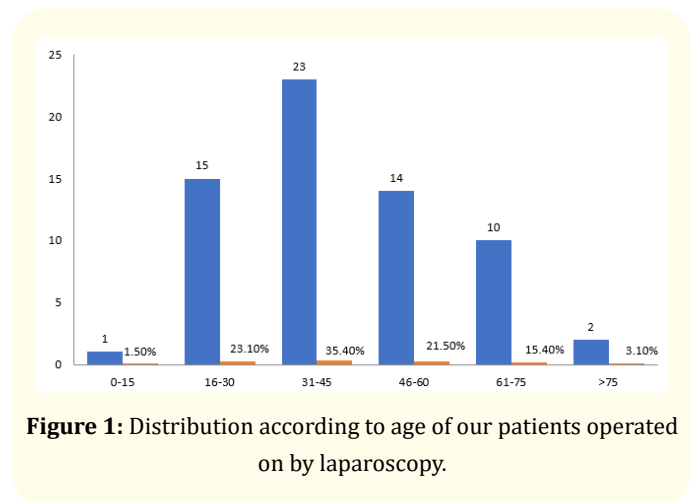
**Materials and Methods**

We carried out a retrospective descriptive cross-sectional study from May 16, 2017 to May 16, 2020 that included all the files of patients regardless of their age and sex, who underwent laparoscopic surgery for diagnostic and/or therapeutic purposes, regardless of the indication. The installation was in the French position in above-mesocolic surgeries. Insufflation by open-coelio was the most performed. Insufflation pressure was 15mmHg in adults and 12mmHg in children. We studied the epidemiological data (frequency, age, sex), pre-operative diagnoses, intra-operative diagnostic adjustment, procedures performed, intra-operative incidents, conversions to laparotomy, duration of intervention and hospitalization, time to resumption of transit, morbidity and mortality.

**Results**

During our study period, 2020 abdominal surgeries were performed. We had 65 cases of laparoscopic surgery, i.e. 3.2% of abdominal surgeries and an average of 5.4 laparoscopies per month, i.e. an average of 21.6 laparoscopies per year. Sixty-two patients (i.e. 95.3%) were operated on in a regulated program. Laparoscopy was for therapeutic purposes in 59 cases (90.7%), for diagnostic and therapeutic purposes in 4 cases (6.1%) and for diagnostic purposes in 2 cases (3.2%). 44 years with extremes of 8 years and 84 years. The most represented age group was that

between 31 and 45 years old (n = 23 or 35.4%) as shown in figure 1. The female sex was the most frequent in 49 cases or 75.3% with a sex ratio of 0.32. In emergency, all our 4 patients were female and were respectively 66 years old, 69 years old, 62 years old and 28 years old. Gallstone disease, complicated or not, was the most common pathology with 55 cases (84.6%) as shown in table 1.



**Figure 1:** Distribution according to age of our patients operated on by laparoscopy.

Pathology	Frequency	Percentage (%)
Symptomatic gallbladder lithiasis	49	75,3
Acute cholecystitis	6	9,5
Under hepatic Acute appendicitis	2	3,2
Acute appendicitis	1	1,5
Appendicular Pelvi-peritonitis	1	1,5
Appendicular Plastron	1	1,5
Rupture of Appendicular mucocele	1	1,5
Right Hydatid liver cyst	1	1,5
Achalasia	1	1,5
Hiatal hernia complicated to severe oesophagitis	1	1,5
Multinodular splenomegaly	1	1,5
TOTAL	65	100

**Table 1:** Pathology in our study and their frequency.

The preoperative diagnosis was confirmed in 62 cases out of the 65 studied (95.3%) or 3 cases (4.7%) of diagnostic recovery (Table 2). Retrograde cholecystectomy was the most performed procedure in 55 (84.6%) followed by appendectomy in 6 cases (9.2%) as shown in table 3. Seven cases (10.7%) of intraoperative incidents were noted. They involved gallbladder breach (n = 3) and hepatic, splenic, esophageal injury and arterial clip release each in 1 case. Two cases (3.2%) of conversion to laparotomy were notified following a splenic wound during esophageal dissection for fundoplication, and the fortuitous discovery of a locally advanced tumor of the ascending colon respectively. The average duration of the operation was 69 min in the case of laparoscopy alone (with extremes of 35 min and 92 min), where as it was 150 min for converted laparoscopy.

Pre operative diagnosis	Final Diagnosis
Appendicular pelvi-peritonitis	Pelvi-peritonitis on salpingitis with healthy appendix
Acute lithiasis cholecystitis	No lithiasis cholecystitis with Fitz Hugh Curtis Syndrome
Ruptured appendicular mucocele	Unruptured appendicular mucocele + locally advanced metastatic ascending colon tumor + high abundance ascites

**Table 2:** Diagnoses corrected intraoperatively in our study.

Gestures	Frequency	Percentage
Cholecystectomy	55	84,6%
Appendectomy	6	9,2%
Fenestration of liver cyst	1	1,5%
Heller Seromyotomy and Dor Fundoplication	1	1,5%
Splenic Biopsy	1	1,5%
Toupet’s Fundoplication	1	1,5%
TOTAL	65	100%

**Table 3:** Gestures performed under laparoscopy in our study.

For all the laparoscopic procedures, the average duration of intervention was 73 min with extremes of 35 min and 195 min. The sequels were uncomplicated in 59 patients (90.7%). The average duration of hospitalization was 3 days, with extremes of 2 and 8 days. The average time to resumption of food was 11 hours, with

extremes of 6 hours and 144 hours (i.e. 6 days). The average transit recovery time was 1.2 days with extremes of 9 hours to 6 days. Four cases (6.1%) of postoperative complications were reported, including suppuration on the trocar orifice (n = 2), reflex ileus (n = 1) and decompensation of diabetes in the ketoacidosis mode (n = 1). Two deaths (3.2%) were reported following decompensation of hypertensive ischemic heart disease, occurring respectively immediately postoperatively and on postoperative day 3 in 70-year-old and 35-year-old patients operated on respectively for fundoplication and appendectomy with ileocecal diversion.

**Discussion**

Laparoscopic surgery represented 3.2% of our surgical activities with an average of 5.4 laparoscopies per month. These rates are low compared to Western series whose frequencies vary between 6 and 22 laparoscopies per month [4,5]. This is a more regular activity and subject to fewer constraints in the West. Our numbers are however superimposable or lower than those of the African series with frequencies of 2.16% to 17.34% [6-9]. This weakness is explained on the one hand by our short period of study but by the lack of personnel trained in the manipulation of the laparoscopic column, the frequent breakage and/or the lack of maintenance of consumables, but also a lack of experience of surgeons. The average age of our patients was 44 years. This average age is generally superimposable on those reported in the African series [8,10,11].

This is explained by the young age of the African population. The predominance of the female sex noted in our series (n = 49 or 75.3%) is widely reported in the literature [12,13]. The indications for laparoscopic surgery in gynecological conditions and lithiasis, which are more frequent conditions in women, would explain this female predominance [4,6,12,13]. In our series, retrograde cholecystectomy was the most performed procedure in 55 (84.6%). The laparoscopic route is recommended in the treatment of uncomplicated cholelithiasis (grade A) [14]. The mortality rate is similar to open surgery. On the other hand, the risk of wound of the bile duct was higher in laparoscopy (0.46%-0.47% vs 0.19%-0.20%) but tends to decrease with time and with the experience of this technic.

In our study, appendectomy followed cholecystectomy with 6 cases (9.2%). The advantages of laparoscopic appendectomy are, in addition to those of any laparoscopic procedure, the fact of avoiding,

by a complete abdominal exploration, in particular in young women, diagnostic errors and of reducing unnecessary appendectomies. It is therefore an indication to be promoted in our particular contexts where the means of diagnostic investigation are limited. We performed two oesogastro-duodenal surgeries by laparoscopy, namely a Heller seromyotomy and a fundoplication. Laparoscopic spleno-hepatic surgery in our study was rare (respectively one case of splenic biopsy and fenestration of hepatic cyst). The indications for laparoscopy are variously discussed according to the authors as summarized in table 4. Our conversion rate was 3.2% or 2 cases, following a splenic wound during esophageal dissection for fundoplication, and the incidental discovery of a locally advanced tumor of the ascending colon respectively.

Which is more or less superimposable to those of most series ranging from 7.4% to 13% [15-17]. In the literature, adhesions are the main conversion factors as described by the French Society of Digestive Surgery [18]. For most authors, iatrogenic intestinal breaches during viscerolysis for band occlusion are, as a rule, causes of conversion. These are iatrogenic complications favored by the fragility of the dilated loops [18,19]. Moreover, the lack of training in laparoscopy, and the often defective equipment partly explains the high rate of conversion noted in our contexts. Thus in his study conducted in our department, Fall reports that defective laparoscopic equipment was the cause of conversion in 8 cases (11.2%) because it did not allow percoelioscopic management of the incidents [20].

Our morbidity was 6.1% (4 cases) including suppuration on the trocar orifice (n = 2), reflex ileus (n = 1) and decompensation of diabetes in the ketoacidosis mode (n = 1). Previous Senegalese series report respectively a morbidity of 1.4% and 5.1% [21,22]. Other Western studies have shown a low prevalence of laparoscopic complications compared to our contexts [23]. Dominated by septic complications, they can be specific to the operation (digestive fistula, postoperative peritonitis). Sometimes they are related to laparoscopy and can be minimal, such as subcutaneous emphysema, or more serious (gas embolism, pneumothorax, etc.) [24]. In our study, the overall mortality of 3.2% is comparable to that found in the series in the literature, which vary between 0% and 4.4% [24-26]. This mortality is related, in our case, to a decompensation of tare. In the literature, laparoscopy is rarely involved outside of a particular pre-existing site. This condition, generally detected preoperatively, may contraindicate the use of laparoscopy [27].

Pathology	Recommended Grade	
	Non	Oui
1 Rolling hiatal hernia		X C
2 Gastroesophageal reflux		X A
3 Achalasia		X C
4 Epiphrenic diverticula		X C
5 Benign tumors of the esophagus		X C
6 GIST		X C
7 Pancreatic resection	X	C
8 Splenic resection		X B
9 MICI :		
10 Ileocecal resection		X A
11 Subtotal colectomy		X C
12 CPT-AIA		X C
13 Obesity		X A
14 Cholelithiasis: * Uncomplicated		X A
* Acute cholecystitis		X A
15 Common bile duct lithiasis		X B
16 Groin hernia	X	A
17 Events	X	B
18 Rectal prolapse		X B
19 Sigmoid diverticulosis		X B
20 perforated UGD		X A
21 Open abdominal trauma		X C
22 Appendicitis	X	A
23 Obstruction of hail	X	C

**Table 4:** Recommendation of laparoscopy in Benign Digestive Pathology [14].

**Conclusion**

Technical innovation increases the feasibility of laparoscopic surgery. However, it requires a rigorous learning curve and experience to expand its indications in general surgery in developing countries.

**Conflicts of Interest**

The authors confirm that they have no conflict of interest

**Author’s Contributions**

The authors confirm to have read and participated in the drafting of the document.

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