

The Trend in Laparoscopic Surgical Practice in the Riverine Ondo, Southwestern Nigeria

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ABSTRACT

Background: Laparoscopic surgery is a minimally invasive surgical practice which is of diagnostic and therapeutic value.

Aim: To determine the indications, operative findings and interventions at laparoscopy in our resource challenged settings.

Methods: This was a two-year prospective study in the university of medical science teaching hospital Ondo and a private laparoscopy George and Martin laparoscopy center, Ore, Ondo State, Nigeria, between January 2020 and January 2022 which included 51 patients. Both diagnostic and therapeutic procedures were followed up during this period. Data on patients' age, gender, indications for surgery, duration of hospital stay, outcome of surgery were analyzed. Data analysis was by the SPSS version 23 (IBM incorporated, Chicago, USA).

Results: Fifty one patients were put under study. The median age was 42 years (mean = 41.73; age range of 8–75years). There were more females 29 (56.9%) than males 22 (43.1%). Laparoscopy was purely diagnostic ($n = 6$, 11.8%), therapeutic ($n = 45$, 88.2%), cholecystectomy ($n = 11$, 21.6%) and intraperitoneal onlay mesh (IPOM) ($n = 11$, 21.6%) were the two most common procedures done. The mean duration of surgery was 96.96 [minutes (diagnostic)], 150 [minutes (therapeutic)]; average duration of hospital stay was 2.3 (± 1.7 days).

Conclusion: Laparoscopic services are expanding in our center with improved facilities, females appear to benefit more in our study and the services involved the young and elderly.

Keywords: Diagnostic, Laparoscopy, Therapeutic.

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INTRODUCTION

Laparoscopy is a minimal access surgical system that permits direct visualization of the peritoneal cavity and its contents for diagnosis and therapy.

Historical Perspective

Giulio Cesare Aranzi (1530–1589) used sunlight for a nasal endoscopy procedure.

Hans Christian Jacobeus (1879–1937) a Swedish surgeon credited with coining the term laparoscopy (laparothorakoskopie) in 1910, performed the first laparoscopic operation in humans.^{1,2} Kurt Semm (1927–2003) performed the first laparoscopic appendectomy in 1980. Also, Phillipe Mouret performed the first laparoscopic cholecystectomy in 1987.

Laparoscopy is of immense benefit in making diagnoses, therapy, and other interventions such as biopsies, cultures, and laparoscopic ultrasonography.

The advantages of laparoscopy include the following:

- Shorter hospital stay
- Lesser wound pain/stress
- Less tissue trauma and related complications
- Better cosmetic results
- Quick return to work
- Video conferencing
- Records of procedures are stored and relayed in use for teaching research and medicolegal proceedings

However, laparoscopy is highly technology dependent. The cost of setup is substantial involving imported equipment and instruments.^{3,4} In an underdeveloped economy and low-resource setting where there is a limited supply of resources and consumables

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and suboptimal basic infrastructure such as poor power supply, the laparoscopic practice may turn out to be a nightmare.

Other challenges include limitations in manpower—doctors, nurses, and technicians skilled in the maintenance of the equipment, poorly funded health, poor level of awareness by the populace, and low willingness of medical personnel to refer patients for this laparoscopic service.⁵

The setup of the laparoscopic tower included the following:

- Hand instruments
- Light source technology
- Lens and optic system development
- Insufflation
- Energy sources such as diathermy, ligasure, harmonic, and thunderbeat energy systems
- Video cameras and monitors. Video laparoscopy is of immense advantage in telehealth and video conferencing. This also has a medicolegal impact on image storage and transmission.

METHODOLOGY

Our study was a 2-year prospective study based on patients from our riverine community who presented in our center between January 2020 and January 2022 and 51 patients were recruited for the study. Both diagnostic and therapeutic procedures were followed up during this period and patient selection was based on ASA 1 and ASA 2 (anesthesia) criteria. Data on patient age, gender, indications for surgery, duration of hospital stay, and outcome of surgery were analyzed using Statistical Package for the Social Sciences (SPSS), version 23, software (IBM Corporation, Chicago, USA).

RESULTS

A total of 51 patients were recruited for the study. The median age was 42 years (mean = 41.73 ± 11.4 years; age range 8–75 years). The male-to-female ratio was 1:1.3. Laparoscopy was purely diagnostic (*n* = 6; 11.8%), therapeutic (*n* = 45, 88.2%). Cholecystectomy (*n* = 11, 21.6%) and intraperitoneal onlay mesh (IPOM) (*n* = 11; 21.6%) were the two most common procedures performed. Table 1 shows the age-group and frequency distribution of the patients. Figure 1 shows the age and gender distribution of patients. Figure 2 describes gender distribution among patients. Table 2 shows the

indications for laparoscopy while Figure 3 shows the distribution of the procedures that we performed. Table 3 shows the histological findings of specimens taken at laparoscopy.

DISCUSSION

The progress in the practice of laparoscopy in recent times in the developing countries is commendable.⁶ Benefits of laparoscopic surgical services in the low resource setting has improved the outlook in the management of patients.⁷

Table 1: Age-group and frequency distribution of patients

Age-group (years)	Frequency	Percent	Cumulative percent
0–10	2	3.9	3.9
11–20	5	9.8	13.7
21–30	3	5.9	19.6
31–40	12	23.5	43.1
41–50	18	35.3	78.4
51–60	7	13.7	92.2
61–70	3	5.9	98.0
71–80	1	2.0	100.0
Total	51	100.0%	

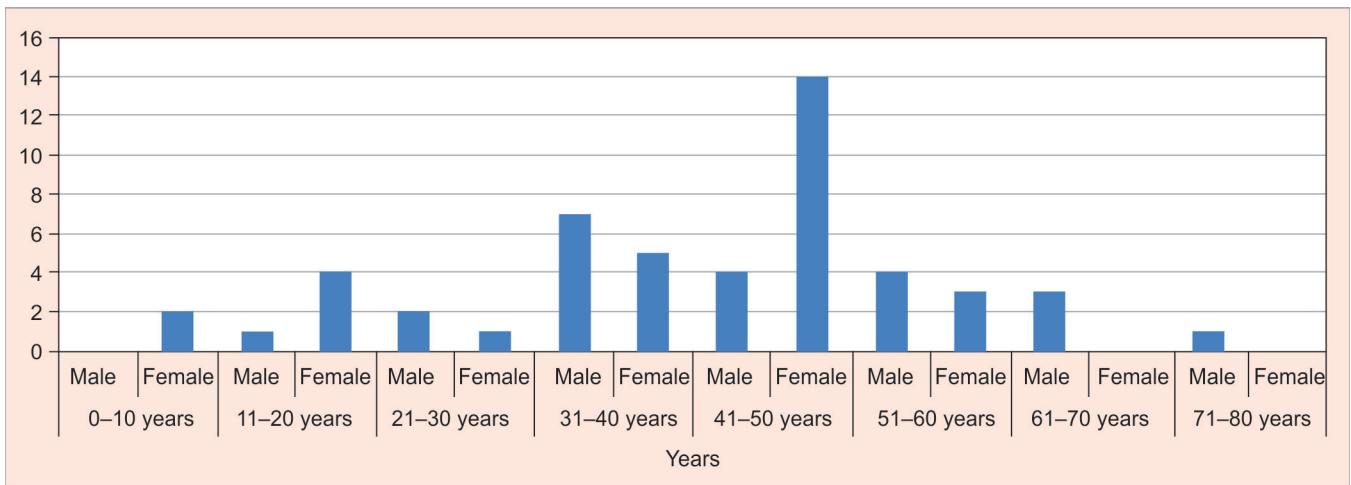


Fig. 1: Age and gender distribution of patients

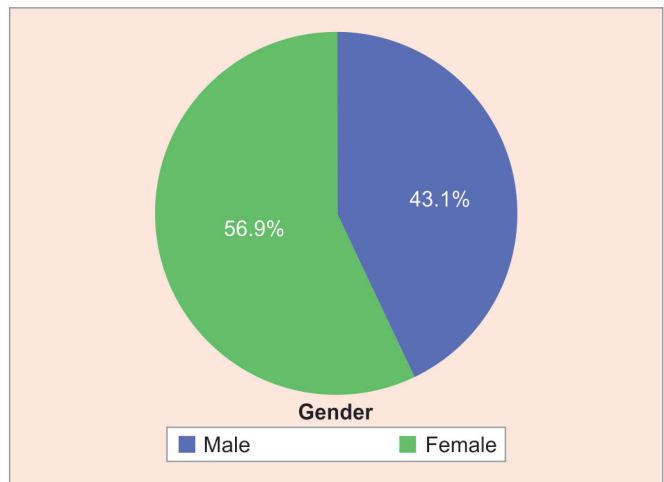
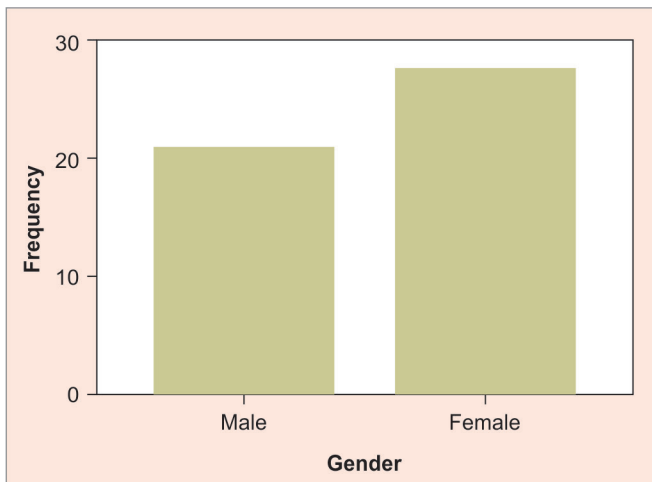


Fig. 2: Gender distribution among patients

Table 2: Indications for laparoscopy

Aim of laparoscopy	Diagnosis	Frequency	Percentage	
Diagnostic laparoscopy	Intra-abdominal mass	4	7.8	
	Blunt abdominal trauma	2	4	
Therapeutic laparoscopy	Appendicitis	9	17.6	
	Perforated peptic ulcer	2	4	
	Paraumbilical hernia	1	1.9	
	Epigastric hernia	5	9.8	
	Cholelithiasis	8	15.6	
	Cholecystitis	3	5.8	
	Recurrent postoperative adhesions	3	5.8	
	Empyema gallbladder	2	4	
	Mucocele gallbladder	1	1.9	
	Pancreatic pseudocyst	2	4	
	Amebic liver abscess	1	1.9	
	Incisional hernia	5	9.8	
	Groin hernia	1	2	
	Reflux esophagitis	2	4	
	Total		51	100

Despite the high cost in the initial setup of this surgical practice our experience revealed local adaptations that could mitigate this cost.⁸

This relates to the practice elsewhere, where such adaptations have been used to make provision for basic requirements in both manpower and equipment setup.

Diagnostic laparoscopy as recorded in our work is beneficial where there are limited resources for modern diagnostic imaging facilities. This diminishes unnecessary laparoscopy with improvement in obtaining tissue samples for histological analysis. This is evident in the literature that estimated the equipment cost ratio of laparoscopy/computed tomography (CT)/magnetic resonance imaging (MRI) at 1:2500:4500.⁹⁻¹¹

The trend in laparoscopic cholecystectomy as seen in our work shows the progressive acceptance of laparoscopy in our developing economy, for even more painstaking abdominal surgeries and a changing pattern in the management of gallbladder disease in a low-resource setting such as ours. This is in contrast to some work elsewhere that highlighted mistrust for new technology, lack of education, poor health knowledge and non-scientific beliefs as barriers to showcasing laparoscopy in poor-income communities.¹²⁻¹⁴

The lower incidence of amebic liver abscess in our study vindicated the spirited effort made via public health intervention

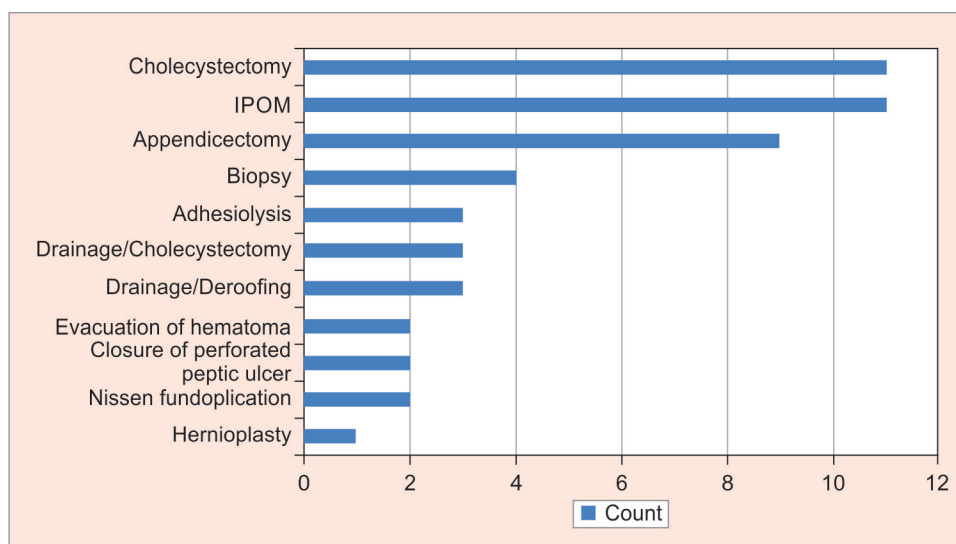


Fig. 3: Distribution of procedures done

Table 3: Histological findings of specimen taken at laparoscopy

Histological findings	Frequency	Percentage
Biopsy not taken	24	47.1
Metastatic gastric adenocarcinoma	1	2.0
Advanced gastric lymphoma	1	2.0
Hepatocellular cancer	1	2.0
Cirrhosis	1	2.0
Chronic cholecystitis	4	7.8
Calculous cholelithiasis	10	19.6
Appendicitis + Fecolith	4	7.8
Appendicitis – kinked	2	3.9
Appendicitis – without fecolith/kinking	3	5.9
Total	51	100.0

in environmental hygiene which otherwise could have been a problem in such a riverine community. Also, no case of appendicitis was associated with schistosomiasis as compared to our previous pilot study.¹⁵

In our work, we did not encounter conversion to open surgery. We also had no technical difficulties like challenges in port placement and loss of tactile feedback likely to be experienced by surgeons in their initial learning curve. We did not experience complications at the establishment of pneumoperitoneum and there were no visceral or vascular injuries.

While some studies showed higher anesthesia-related mortalities in low and middle-income communities compared to developed economies, our study did not show such because of our method of meticulous patient selection.^{16,17}

After the initial expensive setup of the laparoscopy system, some adaptations may be required to lessen the subsequent cost of the equipment.¹⁸ This was credited to Adisa et al. and Galukand and Jombroe.^{19,20}

These cost-effective strategies include the use of reusable instruments, a rubber glove system of tissue retrieval instead of an endo bag, and the use of a television set instead of standard monitors. A dedicated theatre suite for laparoscopy is ideal to allow for a more relaxed atmosphere for surgeons and other staff involved in the delivery of laparoscopy services.

The endpoint in our clime is to establish a dedicated laparoscopy unit with improved facilities and adequate manpower to also achieve on-the-job training and retraining of health workers. Collaborative work among hospitals in laparoscopy services will be fulfilling to improving the more advanced robotic laparoscopy system.²⁰

CONCLUSION

Laparoscopic services are expanding in our center. Appendicitis secondary to schistosomiasis and amoebiasis are no longer the most prevalent pathological findings in our riverine community. Instead, gallbladder diseases are the most predominant finding. Laparoscopic services are beneficial to both the young and elderly. Females appear to benefit more in our study. Cholecystectomy and IPOM hernioplasty are the more popular procedures from our study followed by appendectomy.

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