

# Pilot Study on Laparoscopic Surgery in Port-Harcourt, Nigeria

E Ray-Offor, PE Okoro, I Gbobo, AB Allison

Department of Surgery, University of Port-Harcourt Teaching Hospital, Port-Harcourt, Rivers State, Nigeria

## ABSTRACT

**Background:** Video-laparoscopic surgery has long been practiced in western countries; however documented practice of this minimal access surgical technique are recently emanating from Nigeria. To the best of our knowledge, this is the first documented study on laparoscopic surgery from the Niger Delta region. **Aim:** To evaluate the feasibility of laparoscopy as a useful tool for management of common surgical abdominal conditions in our environment. **Patients and Methods:** This was a prospective outcome study of all consecutive surgical patients who had laparoscopic procedures in general and pediatric surgery units of our institution from August 2011 to December 2012. Data on patient's age, gender, indication for surgery, duration of hospital stay and outcome of surgery were collected and analyzed. **Results:** A total of 15 laparoscopic procedures were performed during this study period with age range of 2-65 years; mean:  $32.27 \pm 17.86$  years. There were 11 males and four females. Six laparoscopic appendicectomies, one laparoscopy-assisted orchidopexy, five diagnostic laparoscopy  $\pm$  biopsy, one laparoscopic trans-abdominal pre-peritoneal herniorrhaphy for bilateral indirect inguinal hernia and two laparoscopic adhesiolysis for small bowel obstruction were performed. All were successfully completed except one conversion (6.7%) for uncontrollable bleeding in an intra-abdominal tumor. **Conclusion:** The practice of laparoscopic surgery in our environment is feasible and safe despite the numerous, but surmountable challenges. There is the need for adequate training of the support staff and a dedicated theatre suite.

**KEYWORDS:** General, laparoscopy, pediatric surgery

## Address for correspondence:

Dr. Emeka Ray-Offor,  
Department of Surgery, University of Port-Harcourt Teaching Hospital,  
P.M.B. 6173, Port-Harcourt, Rivers State, Nigeria.  
E-mail: erayoffor@yahoo.com

## Access this article online

### Quick Response Code:



**Website:** [www.nigerianjsurg.com](http://www.nigerianjsurg.com)

**DOI:**  
10.4103/1117-6806.127104

The advent of minimal access technique of laparoscopy marked a new dawn in surgical care of patients. The panoramic view of laparoscopy aids accurate diagnosis. Video-laparoscopy allows surgical assistants; anesthesiologists and nurses to view what the surgeon is doing and to actively participate in the procedure in their respective roles.<sup>[3]</sup> The other benefits of laparoscopy include less post-operative pain, post-operative morbidity, early recovery and return to normal activity with shorter hospital stay. The cosmetic advantage has played a major role in the acceptance of this type of surgery amongst patients.

A developing country like Nigeria with a lean health budget and an unresolved primary communicable disease challenge has been slow in joining the trend. There is still a palpable skepticism even among surgeons of the feasibility and relevance of laparoscopy in our environment. Albeit pioneering efforts are documented from some parts of the country highlighting the feasibility of this minimal access practice despite immense challenges with a clarion emphasis on local adaptations.<sup>[4-6]</sup> To the best of our knowledge, this is the first documented study from the Niger Delta region to evaluate laparoscopy as a useful tool for management of common surgical abdominal conditions in a developing country.

## PATIENTS AND METHODS

This is a prospective outcome study of all consecutive surgical patients who had laparoscopic procedures in general and pediatric surgery units of our institution-a regional tertiary health facility, from August 2011 to December 2012. Informed consent was

## INTRODUCTION

The 20<sup>th</sup> century witnessed a myriad of advances in technology, which have found several applications in the field of medicine. Video technology was one of the most important factors that enhanced the ability of surgeons to perform complex laparoscopic surgeries. The advantages of laparoscopy were realized in adult surgeries long before its acceptance in pediatric surgery. The reasons for initial non-acceptance included lack of suitable equipment for the pediatric patient, uncommon need for cholecystectomy and perhaps the traditionally smaller incisions in pediatric patients making the cosmetic benefit of laparoscopy less evident.<sup>[1]</sup> Currently, laparoscopy can now be performed in infants weighing less than 1.5 kg without significant mortality or morbidity.<sup>[2]</sup>

obtained after verbal information. A printed educational leaflet on laparoscopy was given to literate patients.

Patients were selected after clinical, laboratory and radiological evaluation to exclude significant co-morbidities. An American Society of Anesthesiology class not greater than 2 was an inclusion criterion. In cases of adhesive small bowel obstruction, patients with features suggestive of carcinomatosis and ischemic necrosis or perforation were excluded. Furthermore cases of complicated acute appendicitis were excluded.

A non-dedicated theatre suite was used with a combination of privately-sourced and hospital equipment. In the absence of a trained endoscopy nurse or technician, resident doctors in the unit were trained by the operating surgeon on equipment handling and disinfection of laparoscopy instruments.

All the procedures were conducted under general anesthesia with endotracheal intubation. There was non-invasive monitoring of temperature, SpO<sub>2</sub>, blood pressure, respiration, pulse rate and urinary output. There was manual ventilation and no functional capnography.

Based on surgeon's preference and presence of previous abdominal scar a closed or open technique was chosen using the Veress needle and Hasson cannula respectively. Visibility was achieved with a 30° 10 mm laparoscope mounted on a Karl Storz (Germany) or Hawk (China) single-chip camera unit connected to a video monitor. The light source was from either a Karl Storz 175W Xenon cold light or Hawk Halogen light sources. A Medilap diathermy unit (India) was the energy source used. Pneumoperitoneum was achieved with carbon dioxide at a pressure of 10-14 mmHg. Two or three ports were used in the diagnostic laparoscopies and conventional 3-ports (10 mm optical and two 5 mm working ports) were used for laparoscopic appendectomy. There was random lateralization or centralization of the optical port i.e. 5 mm working ports at either left iliac and supra-pubic or right lumbar and left iliac fossa respectively to compare ergonomic advantage. Tissue retrieval was routinely carried out using the cannula method and scarcely with an endo-bag.

## Statistics analysis

Data was analyzed using IBM SPSS version 20.

## RESULTS

A total of 15 laparoscopic surgeries were performed during the study period. The age range was from 2 to 65 years (mean: 32.27 ± 17.86 years). There were four females and 11 males. The surgeries included: Six laparoscopic appendectomies, five diagnostic laparoscopies ± biopsy, one laparoscopic-assisted orchidopexy, two laparoscopic adhesiolysis for adhesive small bowel obstruction and one trans-abdominal pre-peritoneal hernia repair for adult bilateral

inguinal herniorrhaphy [Figure 1]. The patients for laparoscopic appendectomy had an even sex distribution (Male: Female 1:1). All were successfully completed irrespective of the position of the optical port [Table 1].

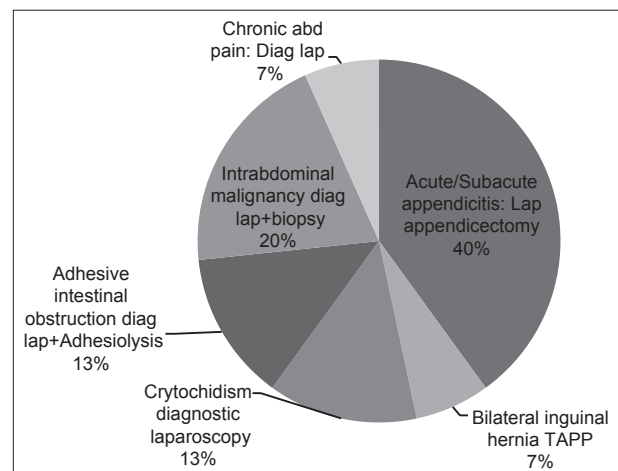
A case of chronic abdominal pains had no pathology observed during diagnostic laparoscopy. The positive findings during the other diagnostic laparoscopies performed are as shown in Table 2. Operating time was from 40 to 300 min and challenges encountered included power outages, equipment failures and technical difficulties. Oral sips of water was commenced within 24 h and patients discharged by 2<sup>nd</sup> day post-operation except for a case of conversion for an intra-abdominal tumor (soft-tissue sarcoma) from uncontrollable bleeding. Surgical complications encountered were Grade I and II of the Clavien-Dindo classification: One wound dehiscence of a 5 mm port site; two post-operative pyrexia; one neuropraxia of superficial peroneal nerve and leg edema from pressure effect of stirrup in lithotomy position during evaluation of the pelvis prior to an appendectomy. Cosmetic outcome was good. No mortality was recorded.

**Table 1: Laparoscopic appendectomies performed**

| Indication             | Age (years) | Sex | Optical trocar position |
|------------------------|-------------|-----|-------------------------|
| Sub-acute appendicitis | 15          | F   | Lateral                 |
| Chronic appendicitis   | 23          | M   | Central                 |
| Acute appendicitis     | 22          | F   | Lateral                 |
| Sub-acute appendicitis | 25          | F   | Lateral                 |
| Acute appendicitis     | 26          | M   | Central                 |
| Acute appendicitis     | 38          | M   | Central                 |

**Table 2: Diagnostic laparoscopies performed**

| Indication             | Age (years) | Sex | Findings                       |
|------------------------|-------------|-----|--------------------------------|
| Intra-abdominal mass   | 53          | M   | Sub-hepatic multi-cystic tumor |
| Intra-abdominal mass   | 65          | M   | Antral gastric tumor           |
| Right iliac fossa mass | 33          | M   | Caecal tumor                   |
| Abdominal pain? cause  | 35          | F   | No abnormality seen            |
| Cryptorchidism         | 2           | M   | Intra-abdominal testis         |



**Figure 1: Laparoscopic surgery during study period**

## DISCUSSION

The indications for laparoscopy are diagnostic or therapeutic. In this study, suspected appendicitis was the predominant indication for surgery. A two-center study from the South-Eastern part of the country also had laparoscopic appendectomy as the most performed procedure.<sup>[6]</sup> This is probably due to the fact that acute appendicitis is a common abdominal pathology and laparoscopic appendectomy requires basic laparoscopic skills to execute. The lateralization or centralization of the optical port was observed not to have a significant effect on the outcome of laparoscopic appendectomy in the early career of a laparoscopic surgeon since all cases were successfully completed. There was no laparoscopic cholecystectomy due to a low incidence of gall stone disease in our center.

Technical difficulties are common in laparoscopy. The peculiar challenges are access, port placement and pneumoperitoneum. The open Hasson port technique is favored by many surgeons in view of less likelihood of visceral and vascular injury, however, the closed access method using the Veress needle is safe, fast and efficacious even in children of all ages.<sup>[7]</sup> We routinely used the closed access method in the absence of previous abdominal surgery; however following access the working ports were inserted under direct vision. A two-port laparoscopic and single port laparoscopic appendectomy are feasible but these have limitations in conditions of extensive adhesion and gangrenous appendix.<sup>[8,9]</sup> There was no perforation of viscus, blood vessel injury nor hemodynamic instability resulting from capnoperitoneum peri-operatively.

The only conversion was for a case of uncontrollable bleeding. This conversion rate of 6.7% ( $n = 1$ ) is similar to 4.1% ( $n = 1$ ) recorded from 24 laparoscopic surgeries performed in a tertiary health facility in Nigeria.<sup>[4]</sup> Comparatively, another Nigerian study of 145 laparoscopic surgeries recorded a conversion rate of 0.027% ( $n = 4$ ).<sup>[10]</sup> This suggests proficiency with volume of practice. Some other challenges encountered during were power outages and lack of trained support staff (endoscopy nurses and technicians). The onus is on the laparoscopic surgeon to acquire an in-depth knowledge of all aspects of the practice from a certified oversea or on-site training to effectively train his support team.<sup>[11,12]</sup> An alternate power supply was adopted as routine during later surgeries.

It is important to note that the operational cost for laparoscopy is not huge after initial set-up i.e., training of personnel, acquisition of equipment and relevant infrastructure. Cost reducing measures adopted included: Use of reusable instruments, cannula

method for tissue retrieval and the choice of extracorporeal knot placement for ligation. These measures though cheap and effective prolong set-up and operating time. In the face of competing theatre usage this is a problem. A dedicated theatre suite for laparoscopy is ideal.

## CONCLUSION

The practice of laparoscopic surgery in our environment is feasible and safe despite the numerous, but surmountable challenges. An institutional will to achieve a routine laparoscopy in a resource-poor setting is achievable with adequately trained surgeons, support staff and necessary infrastructure.

## REFERENCES

1. Zitsman JL. Pediatric minimal-access surgery: Update 2006. *Pediatrics* 2006;118:304-8.
2. Fujimoto T, Segawa O, Lane GJ, Esaki S, Miyano T. Laparoscopic surgery in newborn infants. *Surg Endosc* 1999;13:773-7.
3. Tam PK. Laparoscopic surgery in children. *Arch Dis Child* 2000;82:240-3.
4. Misauno MA, Ismaila BO. Pioneering laparoscopic general surgery in Nigeria. *Niger Med J* 2011;52:104-6.
5. Adisa AO, Lawal OO, Alatisi OI, Adesunkanmi AR. An audit of laparoscopic surgeries in ile-ife, Nigeria. *West Afr J Med* 2011;30:273-6.
6. Ekwunife CN, Chianakwana GN, Anyanwu SN, Emegoakor C. Pioneering laparoscopic surgery in South-Eastern Nigeria: A two-center general surgery experience. *Niger J Basic Clin Sci* 2012;9:75-9.
7. Yanke BV, Horowitz M. Safety of the Veress needle in pediatric laparoscopy. *J Endourol* 2007;21:695-7.
8. D'Alessio A, Piro E, Tadini B, Beretta F. One-trocar transumbilical laparoscopic-assisted appendectomy in children: Our experience. *Eur J Pediatr Surg* 2002;12:24-7.
9. Visnjic S. Transumbilical laparoscopically assisted appendectomy in children: High-tech low-budget surgery. *Surg Endosc* 2008;22:1667-71.
10. Adisa AO, Lawal OO, Arowolo OA, Alatisi OI. Local adaptations aid establishment of laparoscopic surgery in a semiurban Nigerian hospital. *Surg Endosc* 2013;27:390-3.
11. Singh Y. Training and credentialing in laparoscopic surgery-the need of the day. *Med J Armed Forces India* 2005;61:7-8.
12. Galukand M, Jombwe J. Laparoscopic surgery in a resource limited setting: Cost containment, skills transfer and outcomes. *East Afr J Surg* 2012;16:112-7.

**How to cite this article:** Ray-Offor E, Okoro PE, Gbobo I, Allison AB. Pilot study on laparoscopic surgery in Port-Harcourt, Nigeria. *Niger J Surg* 2014;20:23-5.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.