

# Trend Over Time for Cholecystectomy following the Introduction of Laparoscopy in a Nigerian Tertiary Hospital

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ABSTRACT

**Background:** There still exist some concerns about the desirability of laparoscopic surgery in lower-middle income countries. We recently adopted laparoscopy for common general surgical procedures and observed many benefits. This study aims to describe the changing rate of cholecystectomy before and after the introduction of laparoscopy in our hospital. **Methods:** We reviewed the records of cholecystectomies performed before and after the introduction of laparoscopic cholecystectomy (LC) in 2009 in a single general surgery unit of the Ife Hospital Unit of the Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria. Cholecystectomy was reviewed as a percentage of general procedures performed, and postoperative length of stay was calculated. **Results:** A total of 173 cholecystectomies were performed in the hospital between January 2005 and December 2015. The yearly number rose from 7 in 2005 to 31 in 2015 corresponding to 2.7% of total elective major general surgery procedures in 2005 and 9.1% in 2015. A marked progressive increase was observed in the number and rate of cholecystectomies from 2009 following introduction of LC. From 0% in 2005, LC rose to 90% of all cholecystectomies in 2015. The mean postoperative length of stay of patients undergoing cholecystectomy declined from 5.2 days in 2005 to 3 days in 2009 and 1.8 days in 2015. **Conclusion:** This study demonstrates an increased rate of cholecystectomy following the introduction of LC in our setting. We recommend increased adoption of laparoscopy and other forms of minimally invasive surgery across the country.

**KEYWORDS:** Cholecystectomy, laparoscopy, rate

## INTRODUCTION

The initial skepticism for laparoscopic surgery and other forms of minimally invasive surgery (MIS) for common surgical conditions in lower-middle income countries (LMICs) particularly those in sub-Saharan Africa was premised, among others on inadequate and unsatisfactory health-care financing in such countries viz-a-viz the high cost of establishment of MIS, the investment required for training and retraining surgical personnel in the face of insufficient health-care delivery and the perception of MIS as luxurious surgical option in countries where primary health-care goals remains largely unmet.<sup>[1-3]</sup> The criticism and concerns started subsiding with several reports demonstrating particular benefits in LMICs where MIS had been adopted.<sup>[4-6]</sup> Laparoscopy and other forms of MIS are now believed to be more beneficial to poor patients than the affluent ones.<sup>[2,7]</sup> Indeed, the Lancet Commission on Global

Surgery recently proposed the inclusion of MIS in the primary health-care scheme of LMICs.<sup>[8]</sup>

Laparoscopy in general surgical practice commenced fully in our center in 2008. We were able to make some local adaptations and improvisations that enabled the provision of services at costs affordable to the largely agrarian patients we serve,<sup>[9]</sup> and had been able to consistently deploy it for many common surgical conditions in our setting over the past 6 years.<sup>[10-12]</sup> Although previous studies from our part of the world had noted a low incidence of gallstones and other gallbladder diseases,<sup>[13-15]</sup> we continued to observe a change in the turn-over of cholecystectomy since the introduction of laparoscopy

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**How to cite this article:** Adisa AO, Lawal OO, Adejuyigbe O. Trend over time for cholecystectomy following the introduction of laparoscopy in a Nigerian tertiary hospital. Niger J Surg 2017;23:102-5.

Access this article online	
<b>Quick Response Code:</b> 	<b>Website:</b> www.nigerianjsurg.com
	<b>DOI:</b> 10.4103/njs.NJS_56_16

in our center. This spurred the present study which aimed to present the trend and highlight what adoption of laparoscopy impacted on the treatment of gallstone diseases in a tertiary hospital in Nigeria, West Africa.

## METHODS

The setting was Ife Hospital Unit, a 350-bed facility of the Obafemi Awolowo University Teaching Hospitals Complex located in Ile-Ife, Osun State, South-Western Nigeria, which received patient referrals from within the state as well as adjoining states of Oyo, Ondo, and Ekiti. Laparoscopy service was domiciled in one of the two general surgery units of the hospital and has received referrals for laparoscopy from many more states in the South West than the usual catchment areas.

All consecutive elective cases of cholecystectomy in the hospital from 2005 through 2015 formed the subjects of the study. The records were retrospectively studied in cases of open operations done earlier than 2008 and prospectively for laparoscopic and open operations from thence for a yearly rate of cholecystectomy, intra- and post-operative complications, postoperative length of stay and 30 days postoperative mortalities.

Cancellations and delay of operation due to nonavailability of supplies and closure of operating theaters during perennial industrial disputes uniformly affected the elective operation, and cholecystectomy rates in both the open and laparoscopic era studied.

Data were subjected to descriptive analyses using the Statistical Package for Social Sciences Version 22 for Windows (SPSS Inc., Chicago, IL, USA.)

## RESULTS

There were 173 cases of cholecystectomies representing 5.2% of all major general operations performed in the hospital within the study period. The annual elective major general surgical operations rose from 261 in 2005 to 330 in 2015 with some annual spikes in between. Correspondingly, the yearly number of cholecystectomies rose steadily from seven cases in 2005 to 31 in 2015 giving a phenomenal rise of more than 270%. Other common elective procedures performed in the hospital such as thyroidectomy and elective colorectal surgeries witnessed up to 100% increased rates over the years but none compared to the rise in cholecystectomies [Figure 1]. Cholecystectomies, which were 2.7% of total elective major general surgeries in 2005, therefore stood at 9.1% in 2015 as shown in Figure 2.

The number of cholecystectomies consistently increased right from the time of introduction of laparoscopic

operations in 2008 [Figures 1 and 3]. On the other hand, the rate of open cholecystectomies [OC] dropped from 7 and 9 in 2005 and 2006 to 1 and 2 in 2014 and 2015, respectively. There was thus an inverse relationship in the trend of laparoscopic cholecystectomy (LC) to OC between 2008 and 2015 as depicted in Figure 3.

Mean postoperative lengths of hospital stay of patients following cholecystectomy which was 5.2 days in 2005 reduced to 3 days in 2009 following introduction of laparoscopy with a further decline to 1.8 days by 2015 [Figure 4].

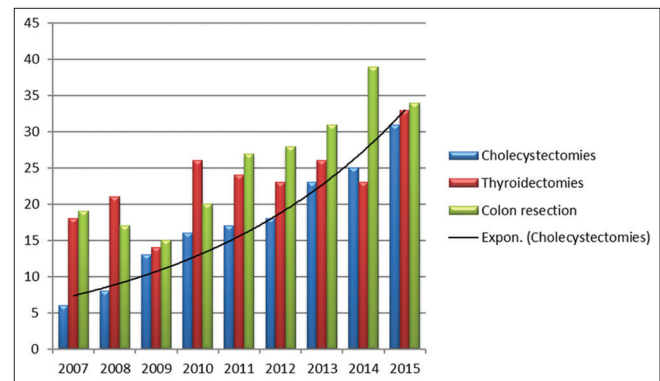


Figure 1: Yearly rates of cholecystectomy in relation to elective colorectal surgeries and thyroidectomies

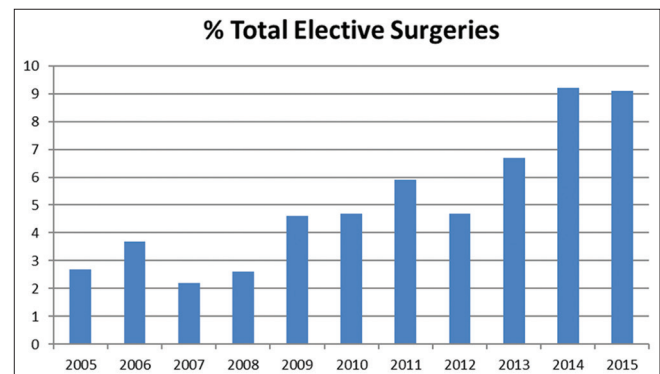


Figure 2: Changing trend of cholecystectomies as a percentage of total elective general surgeries

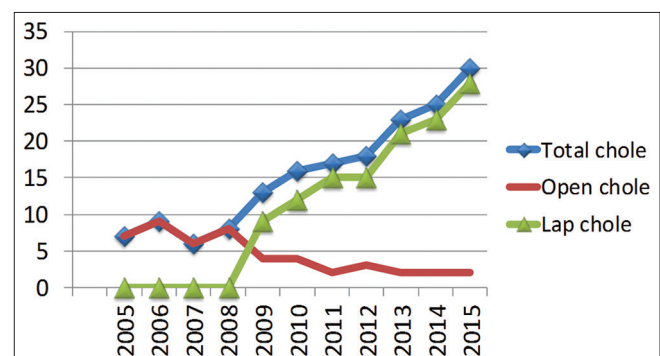
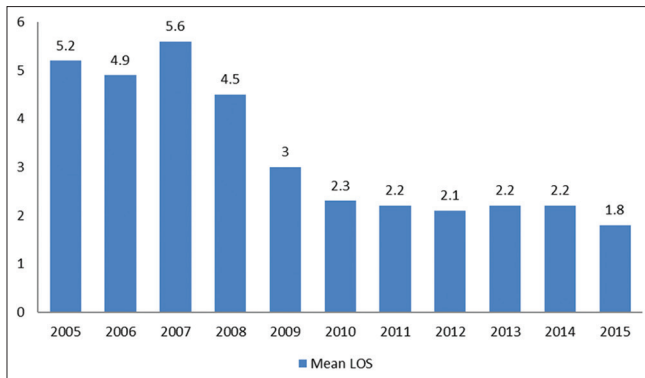


Figure 3: Changing trend of open and laparoscopic cholecystectomies



**Figure 4:** Mean postoperative length of stay for all patients undergoing cholecystectomy

Indications for LC include acute and chronic calculous and acalculous cholecystitis. Patients with preoperative diagnosis of common bile duct stones were excluded from this study. There were six conversion to OC due to uncertain anatomy, excessive bleeding and extensively fibrosed gallbladder in two cases each. No mortality was recorded in this series.

There were no substantial differences in the age range and gender distribution of patients over the study period. Annually, more than half of the patients were young adults in the fourth decade of life, and female patients constitute between 87% of all subjects.

## DISCUSSION

Establishing and sustaining laparoscopy in general surgery through innovative local adaptations in a public-owned health institution in a country where health-care financing takes one of the bottom rungs requires periodic evaluation to experience. The findings of an increase in rate of cholecystectomy following the adoption of LC, the procedure in focus in this series, not only paralleled but also surpassed what had been earlier reported in the Western World and the Middle East. The increase reported ranged between 18.7% in Scotland,<sup>[16]</sup> 22%–29% in the USA,<sup>[17-20]</sup> and 63.7% in Saudi Arabia.<sup>[21]</sup> We observed an increase of more than 270% in this study indicating the degree of impact MIS can attain in a relatively short period of introduction in an LMIC.

In spite of the phenomenal increase we found, the absolute number of cholecystectomies performed is still very low compared to many centers in Western countries. This is due to the relatively low incidence of gallstone disease in Nigeria and other West African countries which has been reported to range between 3%–6% in hospital-based studies<sup>[13,14,22,23]</sup> compared to 64%–73%/among American Indians and 14% among Black Americans in major population-based studies.<sup>[24]</sup>

Being a public hospital, a number of months in different years within the period of this study were lost to incessant industrial actions of health workers across the country. Perhaps without this, the absolute number of cases performed may have been larger.

The peculiar advantages of MIS clearly manifested in the decline of postoperative length of stay of patients within the period of this study. While we are yet to practice day case LC due to logistic problems regarding patients' access to the hospital, the drastic reduction from more than 5 to <2 days on the average presents benefits not only to the hospital in terms of increased surgical bed turnovers but also to the patients who in our developing economy, may have significant economic losses for each day on admission. We believe that expansion of laparoscopy and other forms of MIS in LMICs will impact positively not only on the surgical practice but also on the quality of life of the patients in such populations.

Our study and its findings have certain limitations. The challenges with record keeping in the era of open cholecystectomy in our center made it impossible for us to compare the complications recorded in the open to that of the laparoscopic era. Our experience is also limited to a single general surgical unit in a public tertiary hospital. We are hopeful that with many more public hospitals adopting laparoscopy, we may be able to carry out a multicenter study across our country in the near future. We are also currently studying the possible impact adoption of laparoscopy may have on other common general surgical procedures in our setting.

## CONCLUSION

Although comparatively small in size and of a short time frame, this study essentially demonstrated a trend of increased turnover rate of cholecystectomy following introduction of LC similar to what had been described in other advanced centers. This is in support of the fact that globally and irrespective of where patients may be located, they would generally be attracted by a surgical treatment option associated with particular advantages such as early return to normal activities, short duration of hospitalization, and tiny scars as LC offers. We recommend increased adoption of laparoscopy and other forms of MIS in Nigeria and settings similar to ours.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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