



A ten-year review of laparoscopy in the evaluation of infertility at a tertiary health center in Southwestern Nigeria

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Abstract: Background: Laparoscopy has been found to be very useful in the evaluation of tubo-peritoneal factors in female infertility in Nigeria. This is because of the peculiarity of infective tubo-peritoneal disease as the main aetiological factor of infertility in the region. **Objective:** The main objective of this study was to highlight the experience with out-patient laparoscopy at Olabisi Onabanjo University Teaching Hospital (OOUTH), Sagamu with particular reference to findings, its safety and complications. **Materials and Methods:** This is a retrospective study of 516 patients who had laparoscopy for infertility at the Olabisi Onabanjo University Teaching Hospital, Sagamu between January 1st, 1993 and December 31st, 2002. **Results:** Five hundred and sixteen women had diagnostic laparoscopy under conscious sedation for infertility evaluation at OOUTH, Sagamu from January 1st, 1993 to December 31st, 2002. The median age of the patients was 31.4 ± 3.8 years. Four hundred and seven (78.9%) of the women had secondary infertility. Pelvic adhesions were found in 60.3% of the women irrespective of tubal patency while 61.1% had varying forms of tubal occlusion. Fibroid nodules were the commonest additional significant findings in this study, present in 32.8% of the women. The complication rate was 0.6%. **Conclusion:** Diagnostic laparoscopy under conscious sedation is safe and very useful in the investigation of infertility.

Key words: Infertility; Laparoscopy; Nigeria; Reproductive health; Tubal disease

Introduction

Infertility in Nigeria and also worldwide, remains a common health problem, constituting the commonest indication for routine gynaecological consultations [1]. Tubo-peritoneal factors contribute the largest share to the aetiology of female infertility in Nigeria [2-7]. The evaluation of infertility in Nigeria as well as in Africa as a whole, may

therefore, generally be said to be skewed towards evaluation of tubo-peritoneal factors.

Laparoscopy is an endoscopic procedure in which the pelvic organs are visualized using a specialized fibre-optic instrument passed through the anterior abdominal wall [8]. Jacobaeus first performed it in 1910 and he coined the term laparoscopy. Two years later, Nordentoeft performed laparoscopy as undertaken today with the creation of

pneumoperitoneum and the use of the steep Trendelenburg's position. Palmer modernized the procedure by developing the fibre-optic system of endoscopic illumination [8].

Laparoscopy was introduced into gynaecological practice in the early 1970s [8]. The initial high complication rate is no longer so nowadays due to improved safety precautions. Laparoscopy not only affords a good visualization of the entire pelvis with a view to establishing a cause, it also helps to prognosticate a cure [9].

At Olabisi Onabanjo University Teaching Hospital, Sagamu, diagnostic laparoscopy is an out-patient procedure under conscious sedation. Conscious sedation is the use of intravenous Pethidine (or Pentazocine) and Diazepam, with local Xylocaine infiltration to the intended site of insufflation needle and trocar entry. This is combined with the employment of a series of appropriate words and sentences to produce verbal rapport [7]. Many workers have attested to the feasibility and acceptability of this method [5,9-11].

Diagnostic laparoscopy under conscious sedation has been part of infertility work-up for patients attending the infertility clinic of Olabisi Onabanjo University Teaching Hospital, Sagamu.

This study was carried out to highlight the experience with out-patient laparoscopy at Olabisi Onabanjo University Teaching Hospital, Sagamu with particular reference to findings, its safety and complications.

Materials and Methods

This is a retrospective study of 516 patients who had laparoscopy for infertility at the Olabisi Onabanjo University Teaching Hospital, Sagamu between January 1st, 1993 and December 31st, 2002. Information was obtained from the analysis of the hospital records, case notes and operating theatre records. Ethical approval to conduct this study was given by Ethics and Research Review Committee of the hospital.

All the patients had complained of inability to conceive for a period of 12 months or more. The timing of laparoscopy was usually in the secretory phase of the menstrual cycle. The patients' perineum, vagina and lower abdomen are cleansed and draped. The bladder is drained of urine and a vaginal speculum examination is done to expose the cervix, which is then cannulated with the Reuben's cannula and locked in place with the Volsellum to act as both

a uterine elevator and manipulator during the procedure.

The single-puncture approach was utilized and it was performed under conscious sedation with intravenous Pentazocine 30mg and Diazepam 10mg coupled with local Xylocaine infiltration at the site of puncture. A transverse incision about 1cm in size was usually made just below the umbilicus and slightly deepened into the subcutaneous layer. The Verres needle was introduced through the incision into the peritoneal cavity and the needle was connected to an insufflator bag. Two to three litres of room air was introduced through the Verres needle to create pneumoperitoneum. A trocar and cannula was then introduced into the peritoneal cavity through the infra-umbilical incision. The trocar was withdrawn and the laparoscope introduced through the cannula. The entire pelvis was visualized, assisted by manipulation of the intrauterine cannula. The test of tubal patency was carried out by injection of methylene blue dye through the cannula, looking for evidence of dye spillage into the peritoneal cavity. At the end of procedure, the laparoscope and cannula were withdrawn, the air within the peritoneal cavity expelled manually and the infraumbilical skin incision was closed in layers using absorbable sutures.

The following details were analyzed, namely the patient's age, type of infertility, tubal patency, additional pelvic findings deemed relevant to infertility prognosis and obvious complications encountered. The results were analyzed using simple statistics such as percentages, ratios, median and mean.

Results:

Five hundred and nineteen procedures were performed in the hospital during the period while five hundred and sixteen case files were available for analysis, making a retrieval rate of 99.4%.

Age distribution

Table 1 shows the age distribution of the patients. The age varied between 22 and 45 years with a median of 31.4 years.

Table 1 showing the age distribution of patients who had laparoscopy

Age range (years)	Number	Percentage
20 – 24	77	14.9
25 – 29	169	32.8
30 -34	199	38.6
35 – 39	60	11.6
40 and above	11	2.1
Total	516	100

Type of infertility

Table 2 shows that 78.9% of the patients had secondary infertility while only 21.1% had primary infertility.

Table 2 showing the type of infertility in patients who had laparoscopy

Type of infertility	Number	Percentage
Primary infertility	109	21.1
Secondary infertility	407	78.9
Total	516	100

Type of pelvic adhesions

Table 3 shows that 60.3% of patients had pelvic adhesions and 60.0% of those adhesions were of moderate and severe degrees. Pelvic adhesions were classified according to Siegler [10].

Table 3 showing the types of adhesions seen in patient who had laparoscopy

Type of adhesions	Number	Percentage
No pelvic adhesions	205	39.7
Pelvic adhesions present	311	60.3
Filmy adhesions	115	22.3
Fibrous or moderate adhesions	137	26.6
Dense or severe adhesions	59	11.4

NB:

Mild adhesions

Filmy pelvic adhesions with less than 1cm of tube or ovary involved in bands or strings of adhesions.

Moderate adhesions

Adhesions partially surround tube or ovary.

Severe adhesions

Encapsulating peritubal and/or periovarian adhesions.

One or both tubes or ovaries bound down by adhesions. Obliteration of the cul-de-sac from adhesions.

Test of tubal patency

Table 4 shows the results of tubal patency test. Three hundred and eighteen (61.6%) patients had evidence of tubal occlusion with 211 (40.9%) patients having bilateral tubal occlusion whilst 107 (20.7%) patients had unilateral tubal occlusion.

Table 4 showing the results of tubal patency test in patients who had laparoscopy

Dye test result	Number	Percentage
Both tubes patent	198	38.4
Unilateral occlusion	107	20.7
Bilateral occlusion	211	40.9
Total	516	100

Significant additional findings at laparoscopy

Uterine fibroid was the most significant additional finding at laparoscopy, occurring in 169 (32.8%) of patients. Seventy (13.6%) patients had ovarian cysts while 13 (2.5%) patients had polycystic ovaries- all the 13 patients having presented with primary infertility and oligomenorrhoea (Table 5).

Table 5 showing significant additional findings in patients who had laparoscopy

Findings	Number	Percentage
Uterine fibroids	169	32.8
Ovarian cysts	70	13.6
Polycystic ovaries	13	2.5
Total	252	48.9

Other findings

The duration of the procedure varied from 35 – 50 minutes with a mean duration of 40 minutes.

The commonest technical problem encountered during laparoscopy in this study was obesity, difficulty in dilating and cannulating the cervix, and wrong insufflation of air into subcutaneous tissue. Vomiting occurred in 4 patients but this did not warrant the procedure being abandoned. The procedure was abandoned in a patient due to cervical stenosis with failed attempt at dilatation and the procedure was repeated 4 weeks later after the cervix had been successfully dilated. One patient had superficial wound sepsis. Two cases of surgical emphysema were

recorded. It was mild and it resolved spontaneously. The complication rate was 0.6%. There was no mortality.

Discussion

The finding that only 519 laparoscopies were performed for infertility evaluation at Olabisi Onabanjo University Teaching Hospital over a ten-year period may reflect the fact that only diagnostic laparoscopy was done during the period.

Gynaecological laparoscopy is a complex art which requires much versatility and skill in the use of fibre-optics, light sources, electric current, gas under pressure, cameras and an array of rapidly changing and improving instruments [12].

The age distribution and the type of infertility of subjects in this series are similar to that reported in other studies [5,9,13]. Secondary infertility was very common, accounting for over three-quarters (78.9%) of the cases. This is probably due to tubal blockage resulting from pelvic inflammatory disease, post-abortal or postpartum sepsis [13-15].

Laparoscopy is said to be superior to hysterosalpingography (HSG) in the investigation of infertility and it is now being increasingly used in the developing countries for infertility investigation [5,8,16,17]. The two procedures are complementary but Okonofua *et. al.* recommended that laparoscopy should be performed first and HSG should only be performed if laparoscopy showed abnormalities [18]. The most valid criticism of this recommendation is the invasive nature of the procedure but the often quoted high complication rate of laparoscopy can be considerably reduced by taking the necessary precaution as shown in this study.

The high proportion of women in this study who had pelvic adhesions irrespective of tubal patency, (60.3%) also makes a hysterosalpingogram alone rather inadequate for infertility evaluation. Laparoscopy permits a true assessment of pelvic adhesions, their locations, and severity and whether such adhesions can be separated via the laparoscope (where applicable) [19,20]. Dilatation of a phimotic tubal ostium (condonolysis) can also be carried out via a laparoscopy.

The visualization of fibroid nodules in 32.8% of the women is instructive. The size(s) of the fibroid nodules might not have reached ranges of ultrasonic resolution. While their presence constitutes no obvious harm, their existence may portend an eventual need for surgery of some sort especially if conception is delayed.

The prevalence of polycystic ovaries in this study (2.5%) is lower than the rate reported from other studies, which ranges between 4.2–7.4% [5,13,21]. As ultrasonography and hormone assay facilities become increasingly available in Nigeria, these less invasive and yet more efficient modalities of detecting polycystic ovary syndrome would become cheaper and more widely practiced. This should result in increased detection of polycystic ovaries and only then can the true prevalence of this condition in Nigeria be known [13].

Complication that can occur following laparoscopy include death from general anaesthesia if it is used, skin and internal burns, perforation of organs or blood vessels, haemorrhage, electric shock, post laparoscopy pain, subcutaneous emphysema, nausea and vomiting and rarely carbon dioxide (air) embolism [22].

One of the important findings in this study was the very low rate of complication, which occurred in only three cases out of 516 cases studied. One was the case of a 28-year old woman who developed superficial wound sepsis, which was discovered 48 hours after surgery and it resolved promptly on daily wound dressing and simple broad-spectrum antibiotics (Ampiclox 500mg 6 hourly PO x 5 days); and the other two cases of subcutaneous emphysema, which resolved spontaneously). Similar low complication rate has been reported with laparoscopy under conscious sedation [5,9,10].

This study also revealed a low rate of failed attempt at laparoscopy. There were three cases of such; two cases of subcutaneous emphysema due to wrong placement of Verres' needle and inadvertent insufflation of air into the subcutaneous tissue. The procedure was promptly abandoned and patients observed in the intensive care unit until they recovered from the sedating effects of drugs administered at the beginning at dilatation of the cervix, and the procedure was repeated 4 weeks later after the cervix had been successfully dilated.

Conclusion

Laparoscopy under sedation reduces the risk associated with general anaesthesia. Procedure time and recovery time are shorter. It is cheap and administration is easy without the need for a skilled anaesthetist [8,9]. This is of particular importance in a developing country like Nigeria where not all hospitals that can afford a laparoscope can easily secure the services of an anaesthetist [7].

The disadvantages of under conscious sedation are related to the slightly increased risk of

trauma and occasional failure to achieve good muscle relaxation, which is required for extensive manipulation and detailed inspection of pelvic organs.

In Nigeria, poverty is rife and investigative procedures are expensive. Since patients bear the full cost of health services, the need for practitioners to ascertain the cost effectiveness of every investigation cannot be over-emphasized.

Diagnostic laparoscopy under conscious sedation is cost effective and with the low complications associated with its use in this center, we recommend its use in other hospitals.

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