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(RESEARCH ARTICLE)

Experience with diagnostic laparoscopy for gynaecological indications

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Abstract

Laparoscopy is an endoscopic procedure, which has become an integral part of the evaluation of conditions involving the female reproductive organs. This study retrospectively evaluated all the 420 diagnostic laparoscopic gynaecological procedures performed over the last ten years in an endoscopic gynaecology unit at a tertiary-level hospital. The women's clinical characteristics, the indications for the laparoscopic procedure, the intraoperative findings and complications were evaluated. Ethical approval was obtained from The Institutional Review Board (IRB) for Research and Development (R&D). A simple percentage method was used for statistical analysis. The main indications for diagnostic laparoscopy in gynecology were infertility and chronic pelvic pain. However, in most procedures for chronic pelvic pain, no significant laparoscopic abnormalities justifying this diagnosis were found. There was no mortality or conversion to open laparotomy in this series. Diagnostic laparoscopy for gynecological indications is safe and wider application of this modern technology is recommended for our practice.

Keywords: Diagnostic laparoscopy; Primary amenorrhea; Infertility; Chronic pelvic pain; Endometriosis

Abbreviations

- IRB/R&D: The Institutional Review Board for Research and Development
- IUCD/IUD: Intrauterine contraceptive device
- PID: Pelvic inflammatory disease
- CPP: chronic pelvic pain

1. Introduction

The development of laparoscopy represents one of the most important steps forward in the field of surgery in the past 25 years. Since its introduction by Jacobaeus in 1910, laparoscopy has brought a dramatic change in the approach to the diagnosis and treatment of various diseases of the female reproductive organs. Its application has progressed from a diagnostic procedure into an operative surgical discipline. [1]

The laparoscopic procedure involves creation of an artificial pneumoperitoneum and visualisation of the abdominal cavity by means of an endoscope. Diagnostic laparoscopy is usually a day case procedure, traditionally carried out in an operating theatre under general anesthesia. The procedure is short-lasting: taking between 20 and 30 minutes to complete. It is performed under several indications, some of which are infertility, chronic pelvic pain, pelvic tumors, pelvic inflammatory disease, primary amenorrhea, ectopic pregnancy etc. It has been shown that in approximately 50% of the cases, laparoscopy can diagnose pelvic pathological conditions. [2]

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Though a simple technique, laparoscopy can be associated with potential complications, such as, anaesthetic complications, hemorrhage, injuries to other abdomino-pelvic organs (bowel, bladder and blood vessels), conversion to open laparotomy, post-operative pelvic infections and port-site herniation. Mortality is rare.

This study evaluated diagnostic laparoscopic procedures performed for gynaecological indications and the intra-operative findings in the endoscopic gynecology clinic of a tertiary-level hospital in Ghana over a ten year period (from 2010 to 2019).

2. Methodology

This retrospective descriptive study was conducted in the Department of Obstetrics and Gynaecology of a tertiary-level hospital in Ghana. A total of 420 theatre records of all diagnostic laparoscopic procedures performed for gynaecological indications in the endoscopic gynecology unit between 2010 and 2019 were analyzed. Included in the study were clients who underwent diagnostic laparoscopy in the Obstetrics and Gynaecology Directorate of Komfo Anokye Teaching Hospital (KATH), Kumasi, from 2010 to 2019 irrespective of where they were referred from.

The clinical characteristics of these women (age, menopausal status), the indications for laparoscopy and the intraoperative findings were evaluated. Cases in which the bio-data or other clinical and laparoscopic findings were missing were excluded from the study. Ethical approval for the study was obtained from The Institutional Review Board (IRB) for Research and Development (R&D) with approval number KATH-IRB/AP/008/20. Descriptive analysis (frequencies, means and standard deviations) was performed on the categorical variables.

3. Results

A total of 420 women underwent diagnostic laparoscopy for gynaecological indications between 2010 and 2019. The women's mean age was 32.85 years. The youngest patient was 19 years and oldest was 66 years. Two (0.48%) of the patients were postmenopausal and the rest (99.52%) were pre-menopausal.

The indications for diagnostic laparoscopy are summarized in **Table 1** below.

Table 1 The indications for diagnostic laparoscopy

Indications	Number (n)	Percentage (%)
Infertility	391	93.10
Chronic Pelvic pain	12	2.86
Primary Amenorrhoea	8	1.90
Lost Intrauterine contraceptive device (IUCD)	2	0.48
Suspected ectopic pregnancy	5	1.18
Pelvic Inflammatory Disease (PID)	2	0.48
TOTAL	420	100

Infertility was the commonest indication: 391 (93.10%) of procedures, while chronic pelvic pain and primary amenorrhea and were responsible for 12 (2.86%) and 8 (1.90%) procedures, respectively. The other indications: lost intrauterine device (IUCD), ectopic pregnancy and pelvic inflammatory disease (PID) together contributed to 2.14%.

The main diagnostic laparoscopic findings are depicted in Table 2.

In the sub-group of women who had diagnostic laparoscopy with infertility as the indication, the mean age of the women was 33.15 years. As far as tubal function was concerned, 57.28% had bilateral tubal occlusion, 16.39% had unilateral tubal occlusion, 7.92% had hydrosalpinx (unilateral or bilateral) and 18.31% had bilateral tubal patency.

Table 2 Diagnostic laparoscopic findings according to indications

Laparoscopic findings	**Infertility (N = 391)**		**Chronic pelvic pain (N = 12)**	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Ovarian findings				
normal	192	49.10	11	91.67
adhesions	181	46.29	0	-
simple cyst	13	3.32	1	8.33
endometrioma	2	0.51	0	-
Not accessible due to adhesions	3	0.78	0	-
Total	**391**	**100**	**12**	**100**
Tubal findings				
Bilateral patency	72	18.41	12	100
Bilateral occlusion	224	57.28	-	-
Unilateral occlusion	64	16.39	-	-
Hydrosalpinx (unilateral or bilateral)	31	7.92	-	-
Absent	0	-	-	-
Total	**391**	**100**	**12**	**100**
Uterine findings				
normal	185	47.31	6	50.00
fibroids	202	51.67	5	41.67
anomaly	2	0.51	1	8.33
ademomyosis	2	0.51	0	-
Total	**391**	**100**	**12**	**100**
Peritoneal findings				
normal	200	51.15	7	58.33
endometriosis	7	1.79	3	25.00
adhesions	184	47.06	2	16.67
Total	**391**	**100**	**12**	**100**

For peritoneal abnormalities, 200 (51.15%) had normal findings, 184 (47.06%) had pelvic adhesions and 7 (1.79%) had endometriosis at its various stages.

For uterine factor, 185 (47.31%) had normal uterus with no fibroids or adenomyosis, 202 (51.67%) had uterine fibroids, 2 (0.51%) had uterine anomaly and 2 (0.51%) had adenomyosis.

For ovarian pathology, 13 (3.32%) had simple cyst, 2 (0.51%) had endometrioma, 184 (47.07%) had the ovaries involved in adhesions. 192 (49.10%) of patients had normal looking ovaries.

In the sub-group who had diagnostic laparoscopy with chronic pelvic pain as the indication, the mean age was 30.66 years. 25% of these had endometriosis, 16.67% had pelvic adhesions and 58.33% had no pelvic peritoneal pathology. As far as ovarian pathology was concerned, 11 (91.67%) had normal looking ovaries and 1 (8.33%) had a simple cyst.

All the 12 (100%) had normal looking bilateral patent tubes. For uterine pathology, 6 (50%) had normal uterus, 5 (41.67%) had uterine fibroids and 1 (8.33) had a uterine anomaly.

For complications associated with diagnostic laparoscopy, there was no mortality, visceral or vascular injury or conversion to open laparotomy in this series.

4. Discussion

Our study showed that the main indications for diagnostic gynaecological laparoscopy were infertility (93.10%) and chronic pelvic pain which showed a small percentage of 2.86%. The primary findings were tubal alterations in the sub-group of women with infertility (81.59%) and peritoneal alterations (41.67% endometriosis or adhesion) in the sub-group of women with chronic pelvic pain. Similar results are noted in the literature. In a study on 1654 diagnostic laparoscopic procedures, Ikechebelu JI., 2013 showed that the main indications for the procedure were infertility (98%) and chronic pelvic pain (2%). [2] In another study by Aziz N. in 2010, laparoscopy was indicated in 89% of the cases of infertility in the United States, while in Canada it was indicated in 63% of the cases. [3] In cases of chronic pelvic pain, (Bolach S., et al 2013) noted laparoscopy was indicated in 40% of cases. [4]

Our study showed that in patients with infertility, tubal abnormalities were the most prevalent finding followed by presence of adhesions involving the ovaries and the pelvic peritoneum. However, in a study on 206 women with infertility, laparoscopy showed that 20.4% had pelvic adhesions, 13.6% tubal obstruction and 5.8% endometriosis. [5]

Another study on 328 infertile women showed that laparoscopy diagnosed that 16% had pelvic adhesions, 19% tubal obstruction, 26% endometriosis and 13% pelvic infection. [6]

In the literature, in cases in which laparoscopy was indicated due to infertility, the main findings were tubal alterations and endometriosis. [3, 7] However, in our series, endometriosis was in the minority.

Chronic pelvic pain is characterized by a painful sensation in the lower abdomen or pelvis, which may be either intermittent or constant, with or without a cyclic nature, lasting for at least six months and intense enough to lead the woman to seek medical care. Its prevalence has been estimated at between 12% and 29%. [8] Laparoscopy is an indispensable diagnostic aid in cases of chronic pelvic pain. It can be useful for diagnosing diseases such as endometriosis, pelvic adhesions, ovarian cysts and pelvic inflammatory disease. In cases of suspected endometriosis, laparoscopy is the gold standard for diagnosis. It is used for staging the disease (endometriosis grades 1, 2, 3 and 4). Laparoscopy can be used to evaluate subserosal fibroids as well as ovarian cysts and pelvic adhesions. It can be used to diagnose some uterine anomalies such as congenital uterine malformations (unicornuate, bicornuate or didelphys uterus), which is not always possible with ultrasound.

In our series, in the group with chronic pelvic pain, 25% had endometriosis, 16.67% had pelvic adhesions and 58.33% had no pelvic peritoneal pathology. As far as uterine factor was concerned, 41.67% had uterine fibroids. It is debatable if these fibroids were the cause of chronic pelvic pain in these women.

Many studies have evaluated laparoscopy in women with chronic pelvic pain. In one study that evaluated 44 women with chronic pelvic pain in comparison with 31 women without pain, laparoscopy found that 88.4% of the group with pelvic pain and 42% of the group without pain presented alterations. In the literature, the incidence of laparoscopic findings among women with chronic pelvic pain was between 35% and 83%. [5] In another recent study on 85 women with chronic pelvic pain, laparoscopy showed that 20% had pelvic tuberculosis, 13% endometriosis, 9% adhesions and 7% adnexal cysts. [4]

Diagnostic laparoscopy has associated complications. Commonly occurring complications include: damage to other abdominopelvic organs (such as urinary bladder, bowel and blood vessels), hemorrhage, and unintended conversion to open surgery, although the later is uncommon. [9.10,11] Like any other surgeries, it can also be complicated by anesthetic problems and postoperative infection. [12]

Our series recorded no complication rate. This can be attributable to careful patient selection, ensuring that the procedure was actually indicated, Palmer's point entry in patients with previous midline abdominal incisions, use of safe entry techniques and the experience of the surgeon.

Laparoscopy may be indicated in gynaecological emergencies. In cases of acute pelvic pain it aids in the identification of pelvic inflammatory disease, adnexal torsion, ruptured and unruptured ectopic pregnancy and ruptured hemorrhagic

cysts. It is also very useful in the evaluation of the pelvis and the uterus in cases of uterine perforations during hysteroscopy or insertion of an intrauterine device (IUCD).

However, certain patient co-morbidities may limit the use of laparoscopy. These may be either a permanent or a temporary health condition presented by the patient. Such conditions might present an absolute or relative contraindication to surgery or might require open surgery instead of laparoscopy because of technical difficulties. Among these conditions are severe heart disease, hemodynamic instability (septic or hypovolemic shock) and severe respiratory diseases, which may worsen through pneumoperitoneum created during laparoscopy. Intracranial hypertension can also be aggravated by the head-down position adopted during laparoscopy. Other conditions that limit the use of laparoscopy include the presence of distended bowels, which can be damaged by the equipment; presence of a large abdominal mass; advanced pregnancy; histories of several previous surgeries, which might distort the anatomy and hinder viewing; and obesity, which can make it impossible to implement pneumoperitoneum. Multidisciplinary team pre-assessment of these patients with anaesthetic team will help to ensure better outcomes for these patients.

Laparoscopy has significant advantages of low complication rates, shorter duration of operations and shorter hospital stay. It enables diagnosis and efficient planning of definitive treatment for gynaecological conditions. It has therefore become an indispensable and widely used field in gynecology. It is undoubtedly beneficial to ensure regular training updates for surgeons and trainees, careful patient selection and use of safety principles if we want to maintain these safety trends.

5. Limitations

Since this study was a retrospective one, some cases which lacked some data and surgical findings were excluded. The findings cannot be generalized as this was conducted in a tertiary unit. A more extensive prospective study is therefore required. This is a prelude to a prospective study we intend to conduct on laparoscopic surgeries that are performed in our unit.

6. Conclusion

The main indications for laparoscopy in gynecology were infertility and chronic pelvic pain. However, in patients with chronic pelvic pain, in most procedures, no abnormalities justifying the diagnosis were found. Diagnostic laparoscopy for gynecological indications is safe therefore, wider application of this modern technology is recommended for our practice.

Compliance with ethical standards

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Disclosure of conflict of interest

None of the authors of this manuscript have any conflict of interest to declare.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors. However since this study was conducted at a health institution, ethical approval was given by the Institutional Review Board for Research and Development (IRB R&D)

Statement of informed consent

This study did not involve information about any individual e.g. case studies, survey, interview etc. As such informed consent from individual participants was not required.

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