

Experience with diagnostic laparoscopy for gynecological indications

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Abstract

Context: Diagnostic laparoscopy is an endoscopy procedure, which has become indispensable in the evaluation of the female reproductive organs especially in infertility.

Aim: Experience with conversion to open laparotomy is presented and ways of averting this complication are discussed.

Settings and Design: A retrospective study was performed.

Materials and Methods: All the 1654 diagnostic laparoscopies performed at a private fertility center over a 10-year period (January 2000 to December 2009) were analyzed for indications, cases of conversion to open laparotomy, and measures taken to prevent this complication.

Statistical Analysis Used: Simple percentage method was used.

Results: Infertility was the commonest indication for 1627 (98.4%) procedures, while primary amenorrhoea and chronic pelvic pain were responsible for 20 (1.2%) and 7 (0.4%) procedures, respectively. There was no mortality in this series. There was conversion to open laparotomy due to hemorrhage in only 2 (0.12%) procedures and this happened at the first year of practice.

Conclusions: The low rate of conversion was attributed to the surgeons experience, proper patient selection, and the use of Palmers point for insufflation in some patients with previous pelvic surgeries and use of supraumbilical access in patients with pelvic masses. Diagnostic laparoscopy for gynecological indications is safe and wider application of this modern technology is recommended for our practice.

Key words: Amenorrhoea, conversion, hemorrhage, infertility, laparoscopy

Date of Acceptance: 27-Feb-2012

Introduction

Diagnostic laparoscopy is best performed by a reproductive specialist as surgical treatment and can often be done during diagnostic evaluation. It is performed to evaluate the female reproductive system or other gynecological complaints like chronic pelvic pain.^[1-3] Diagnostic laparoscopy is traditionally done in operating theatre under general anesthesia;^[4] though there has been reports of use of local anesthesia with sedation for office laparoscopy.^[5,6] The procedure takes between 20 and 30 min and the patients are usually discharged from the hospital the same day.

The complications associated with laparoscopic procedures include damage to other abdominopelvic organs, hemorrhage, and unintended conversion to open surgery, although the later is uncommon.^[7-9] Like any other surgeries, it can also be complicated by anesthetic problems and postoperative infection.^[10]

In this study, experience with diagnostic laparoscopy and particularly conversion to open laparotomy is presented and ways of averting this complication are discussed.

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Materials and Methods

This is a 10-year review of diagnostic laparoscopy performed at a private fertility center from January 2000 to December 2009. Since the year 2000 to date, this center offers weekly sessions for diagnostic laparoscopy for fertility evaluation and other gynecological indications. It receives referrals from neighboring towns/states and has developed into a training center in minimal access surgery.

During the laparoscopy sessions, the patients and their spouses/relations are counseled on the procedure and they sign an informed consent. All the procedures were performed following an overnight fast and under ketamine general anesthesia by the author.^[4]

During the procedure, the patient is anesthetized and placed in lithotomy trendelenburg position. The abdomen, perineum, and vagina are cleansed and draped leaving only the umbilical area and the vulva. Vaginal examination is done and the cervix exposed and grasped with a pair of vulselum forceps transversely. Uterine cannula is introduced via the external cervical os and anchored to the vulselum forceps. An assistant usually performs this vaginal aspect and also injects the methylene blue dye in infertility cases during the procedure. Subsequently, the access point for the first port is determined and in most cases the infraumbilical area (smiling incision) is preferred. A stab skin incision is made on the area and the Verres' needle introduced for CO₂ insufflation to achieve the desired pneumoperitoneum. Then, the incision is extended to 11 mm and trochar and cannula were introduced. The trochar is withdrawn and the laparoscope passed into the peritoneal cavity for examination of the abdominal and pelvic organs. A second port may be required to pass an instrument that will expose the structures for proper visualization.

Methylene blue dye is then injected via the uterine cannula to access tubal patency. After this, the instruments and later the telescope and cannula are withdrawn and the port wound(s) closed with an absorbable suture in a subcortical manner. Dressing is applied and patient is discharged home on full recovery from the anesthesia. The procedure is recorded on video and available for review.

Results

A total of 1654 diagnostic laparoscopies were performed during the study period. The indications for the procedures were infertility (1627; 98.4%), primary amenorrhoea (20; 1.2%), and chronic pelvic pain (7; 0.4%), respectively. No mortality was recorded in this series. Only two conversions due to hemorrhage out of 124 procedures were encountered in the first year of practice, given a conversion rate of 1.61% for the first year of practice. There were no

conversions in the other years given a conversion rate of 0.12% for the 10-year study period. The details are shown in Table 1.

The details of the two conversions are as follows:

Case 1

Mrs. C.E. was a 32-year-old nulliparous woman who presented at Life Fertility Center on 3/4/2000 with a 1 year history of infertility and lower abdominal mass. The husband had a normal seminal fluid analysis result with a sperm count of $32 \times 10^6/\text{ml}$ and 60% actively motile sperms. She had a 28-day cycle with 5 days normal flow and her last menstrual period (LMP) was on 24/3/2000. She had splenectomy in 1995 via an abdominal incision extending from below the xiphoid sternum to a point above the symphysis pubis. Abdominal examination revealed a uterine mass equivalent to 16 weeks gestation size. She was scheduled for laparoscopy and dye test to evaluate both tubal and peritoneal factors.

Diagnostic laparoscopy was performed on the patient using ketamine general anesthesia. The following findings were observed. Bulky retroverted uterus with multiple fibroid masses (intramural and subserous). The uterine cavity was 9 cm in depth and the external os was nulliparous. There was a small puncture on the anterior fibroid mass by the Verres' needle with leakage of blood into the peritoneal cavity. Both fallopian tubes and ovaries were shielded from view by the multiple fibroid masses and no evidence of dye spillage was noted. There were no pelvic adhesions. The patient recovered fully from anesthesia but continued to complain of weakness. Six hours postlaparoscopy, her vital signs revealed a rising pulse rate and falling blood pressure of 80/40 mmHg. There was also abdominal distension with tenderness and guarding. Abdominal paracentesis yielded blood and a diagnosis of hemoperitoneum was made. An emergency laparotomy was performed and the bleeding was confirmed to be from the puncture site. She then had myomectomy and received 3 units of whole blood. She had an uneventful recovery and was discharged home on

Table 1: Conversions during diagnostic laparoscopy

Year	No. of diagnostic laparoscopies	No. of conversions	%
2000	124	2	1.61
2001	108	0	0.0
2002	173	0	0.0
2003	160	0	0.0
2004	202	0	0.0
2005	139	0	0.0
2006	146	0	0.0
2007	175	0	0.0
2008	223	0	0.0
2009	204	0	0.0
Total	1654	2	0.12

the 8th postoperative day after removal of the skin sutures. Two months later, she became pregnant and went ahead to deliver a live female baby at term.

Case 2

Mrs. A.A. was a 34-year-old nulliparous woman who presented at Life Fertility Center on 13/08/2000 with a 4 year history of primary infertility. Her husband had a normal seminal fluid analysis with a sperm count of $45 \times 10^6/\text{ml}$ and 75% progressive motility. She had a 28-day cycle with 3-4 days of menstrual flow and her LMP was on 6/08/2000. She was obese with a body mass index (BMI) of 28 and no palpable abdominal mass. She had a hysterosalpingogram (HSG) that showed bilateral tubal occlusion and was then scheduled for diagnostic laparoscopy. The hematological parameters were normal.

Diagnostic laparoscopy was performed using ketamine general anesthesia. The following findings were observed. There was an active arterial bleed from the uterine mass. Inadvertently, the Verres' needle had perforated a vessel running superficially on one of the uterine fibroid masses. We had no instrument for operative laparoscopy or for cauterization. The procedure was abandoned for an emergency laparotomy. She had a successful laparotomy and myomectomy and was discharged home on the 8th postoperative day.

Discussion

This conversion rate of 0.12% in my 10 years of performing diagnostic laparoscopy is lower than reports from other centers.^[7,9] The conversions took place in the first year of practice and agree with presentation by other laparoscopic surgeons that the rate of conversions/complications is inversely related to the surgeon's experience.^[7] This is in keeping with the long learning curve for laparoscopic surgery.

The conversions in this study were due to hemorrhage caused by the Verres' needle injury to uterine fibroid mass. Other factors or complications that can lead to conversion include damage to a major vessel, bowel injury, the nature of the procedure, the overall patient health, level of laparoscopic complexity, BMI greater than 30 kg/m², suspicion of malignancy, history of laparotomy, presence of adhesions, and intraoperative technical difficulty.^[7,9]

These were not encountered in this series. The introduction of the Verres' needle via the infraumbilical access point in the presence of pelvic mass (though unnoticed in case 2) predisposed to these complications. Instead, the Palmers point (2-3 cm below left costal margin, at the midclavicular line) should have been used for introduction of Verres' needle to avoid this complication, or open method using

Hanson's cannula should have sufficed. Indeed, I had subsequently used the Palmers point even for pelvic masses up to 18 weeks without similar complication. Second, I now perform pelvic ultrasonography for all patients scheduled for diagnostic laparoscopy to assess for pelvic masses and decide on the access point for the Verres' needle. This is recommended since some pelvic masses may not be palpable per abdomen especially in obese patients as reported in case 2. Third, supraumbilical access point can also be used to minimize risk of trauma to pelvic masses. These three approaches have been used effectively in my practice without any further conversions.

The hemorrhage would have been controlled or control attempted laparoscopically with injection of vasopressin or cauterization. These options were not used in the cases presented because the center was then equipped for only diagnostic laparoscopy. It is argued that diagnostic laparoscopy alone without facilities for operative laparoscopy should not be done as this will amount to double exposure to anesthesia if the pathologies found at diagnostic laparoscopy will be dealt with at another operation. However, diagnostic laparoscopy offers the young laparoscopic surgeon an opportunity to learn the art of laparoscopy, especially the hand-eye coordination and movement appreciation. Also diagnostic laparoscopy for fertility evaluation is pertinent in our environment where there is high incidence of tubal and peritoneal factors as causes of the female infertility.^[11]

Conclusion

Diagnostic laparoscopy is safe and conversions to open laparotomy especially from hemorrhage is rare and can be avoided by proper patient selection and use of Palmers point for insufflation, supraumbilical access point, or open (Hanson's) technique especially in those patients' with pelvic masses or previous abdominopelvic surgeries.

Acknowledgments

My sincere thanks go to the different medical officers and resident doctors who have worked with me and assisted me in performing the laparoscopy procedures at different times. I also thank the theater staff of the hospital for their support and cooperation during the ten years of this review.

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How to cite this article: ???

Source of Support: Nil, Conflict of Interest: None declared.

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