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Research Paper

Role of Diagnostic Laparoscopy in Infertility – Study of 50 cases

Medical Science

KEYWORDS : Diagnostic laparoscopy, Endometriosis, PCOD

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ABSTRACT

Objective(s) : To evaluate role of diagnostic laparoscopy in evaluation of Uterine, Tubal, Ovarian and pelvic anatomy and pathology which is responsible for infertility.

Method(s) : A total of 50 women underwent diagnostic laparoscopy during the period of July 2010 to August 2012. Age ranged from 21 years to 40 years. After doing all the workup as required, diagnostic endoscopy was done under general anesthesia along with Chromopertubation for testing tubal patency.

Observations : Majority of patients (70%) were from age group of 21 – 30 years with average duration of active married life of 2 – 6 years. 68% of the patients were having primary infertility and 32% were having secondary infertility. Abnormal Laparoscopic findings were noted in 74% cases .Ovarian factor was responsible for 34% cases, tubal factor for 22% cases, pelvic pathology for 20% and uterine factor for 10% cases. Unilateral tubal blockage was diagnosed in 10% cases and bilateral tubal blockage in 3% . In 4% cases bilateral block with beaded appearance found suggestive of TB. Uterine anomalies were found in 10% patients. Myomas were found in 6% of the cases. Of total 50 cases, 14% cases were found to have endometriosis, 22% had polycystic disease of ovary (PCOD), chocolate cyst found in 10% cases and 11% had functional cyst of ovary. Pelvic adhesions were found in 7% patients. During laparoscopy 2% had extra peritoneal insufflations of air while during postoperative period 4% had abdominal pain and 4% had wound sepsis.

Conclusion: Approximately two third (74%) of cases had some form of tubal, peritoneal, uterine and ovarian pathologies which makes laparoscopy as an invaluable part of infertility workup. Its added value in reduced morbidity, shorter hospital stay and cosmetic has helped to establish its place in contemporary and future gynecologic practice. However, use of other non-penetrative tools should be considered first to avoid complications of the procedure.

INTRODUCTION

According to WHO, "Positive reproductive health of a women is a state of complete physical, mental and social wellbeing and not merely absence of disease related to reproductive system and functions".(1)"Infertility is defined as the capability of a couple to achieve conception after one year of unprotected coitus".Contrary to popular perception the overall incidence of infertility has remained relatively unchanged over the past 3 decades. It is affecting approximately 10-15% of married couples(2). Off all the couples attempting to conceive, 16% are unsuccessful after 1 year. This reduces to 8% after 2 years and 7% after 3 years(3). Diagnostic scopy is a basic skill which allows direct visualization of the abdominal and pelvic organs so that definitive diagnosis could be made where clinical evaluation and imaging techniques have failed or equivocal(4). It is very simple and safe, less invasive procedure with its cost effectiveness. The view obtained at laparoscopy is identical with appearance of these organs at the time of laparotomy.This is called "Panoramic view". Laparoscopy is a complimentary tool not only in diagnosis of infertility but also in treatment of selected cases(5). It is the field of infertility that laparoscopy has perhaps its most important use."It has been truly said "Better an eye in the pelvis than two fingers in the vagina"Grant(6).

METHOD(S)

This study was performed on 50 patients of infertility either primary or secondary. After thorough gynecological examination and with all necessary investigations(human semen analysis, baseline endocrinal investigations, post coital study, cervical mucus study, ovulation study ,post menstrual HSG) patient was admitted a day before surgery and preop fitness was taken.. On the day of surgery, patient was given general anesthesia and modified lithotomy position with legs flexed to 45 degrees. A bimanual pelvic examination under general anesthesia is done. After measuring uterocervical length Rubins cannula was fixed in position by holding cervix transversely with tenaculum. Cannula was useful for moving internal organ and for patency test as well as for the correction of retroverted uterus. Pneumoperitoneum was created using carbon dioxide gas (inert, safest, readily absorbable, not supporting combustion) through veress needle inserted through lower border of umbilicus keeping in mind not to choose an area adjacent to previous laparotomy scar for fear of damage to adherent bowel. The optimal sign for a successful puncture of abdominal skin is a soft listing sound as the needle enters. The gas flow rate was kept at 1 liter/minute and approx. 1 – 1.5 liter gas was required for diagnostic scopy to maintain pressure of 12mm Hg inside the peritoneal cavity. If the needle is attached to carbon dioxide pneumoapparatus, with the machine closed and abdominal wall is elevated a negative pressure indicates correct placement of needle. Pneumoperitoneum should be considered adequate when the abdominal wall is uniformly bulging and the liver dullness is obliterated. The trocar cannula is pushed in at 45 degrees with screwing movement after lifting the lower abdominal wall. The cannula is removed and laparoscope was introduced. The pelvic organs are first inspected by manipulating uterus, tubes, ovaries, pouch of Douglas are visualized for any pathology. Chromopertubation was done to check the patency of tubes by injecting dilute methylene blue through the intrauterine cannula. Any endometriotric implant is ruled out by thorough examination. Double puncture technique is more reliable to rule out pelvic pathology. After completion of procedure, laparoscope is removed and trocar sleeve is kept open to remove air from abdominal cavity. The trocar is introduced and trocar cannula is removed. The skin was sutured and sterile dressing was done. Complications such as extra peritoneal insufflation of air, uterine perforation, abdominal pain, wound sepsis, subcutaneous emphysema, peritonitis, hemorrhage, shock may occur during laparoscopic procedure.

OBSERVATIONS

Out of 50 patients 34 patients(68%) were of primary infertility and 16 (32%) were of secondary infertility .In primary infertility the maximum number of patients (18) belonged to age group of 21 – 25 years and in secondary infertility maximum no. of patients (8) belonged to age above 26 years. In primary infertility 65% patients had active married life of 2 – 4 years, while in secondary infertility 81% of patients had active married life of

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more than 6 years. In our study among 50 patients, single puncture technique was performed in 26% cases and double puncture technique was performed in 74% cases. Among 50 patients 13(26%) had absolutely normal laparoscopic findings. According to Leon Speroff the major causes of infertility are ovular dysfunction (40%), tubal and pelvic pathology (30-40%) and unusual problem like uterine factor responsible for 10% cases.

TABLE-1 CAUSES OF INFERTILITY

Type of pathology	Percentage of cases (%)
Ovular	34
Tubal	22
Pelvic	20
Uterine	10

Among the various pathologies of pelvic organ, ovarian pathology contributed the most (34%), followed by tubal (22%), pelvic (20%) and uterine (10%) pathologies.

TABLE-2 VARIOUS PATHOLOGIES OF PELVIC ORGAN RESPONSIBLE FOR INFERTILITY

Ovarian Factors(%)	Tubal Factors(%)	Uterine Factors(%)
Normal(66)	Normal(78)	Normal(90)
Bilateral cystic ovaries(22.36)	Unilateral block(10)	Fibroid(6)
Chocolate cyst (10.64)	Bilateral block(3)	Congenital Anomaly(4)
Simple cyst(1)	Tubo-ovarian mass(3)	
	B/L block with beaded appearance(2)	
	Hydrosalpinx(2)	
	Rudimentary horn(1)	
	Fimbrial cyst(1)	

Among the ovarian factors in present series, bilateral cystic ovaries were present in maximum no. of cases (22.36%), followed by chocolate cyst (10.64%) and simple cyst (1%). And next among the tubal factors unilateral tubal block contributed the most (10%) followed by bilateral block (3%) and tubo-ovarian mass (3%). Bilateral block with beaded appearance, hydrosalpinx, rudimentary horn and fimbrial block were other tubal pathologies which were seen. Fibroid uterus (6%) and congenital anomalies 4%) were among the uterine pathology. One patient had arcuate uterus and one had small uterus. Pelvic adhesions were seen in 10 patients and about 3 patients had Koch's abdomen.

TABLE-3 COMPLICATIONS OF LAPAROSCOPY

Complications	Cases (%)
Extra-peritoneal insufflation of air	2
Abdominal pain	4
Wound sepsis	2

During the operative period extra peritoneal insufflation of air was seen in 2% of patients and during the post-operative period abdominal pain and wound sepsis were experienced by 4% and 2% of patients respectively.

DISCUSSION

The fallopian tube has numerous functions, including ovum pick-up, the place of fertilization of the ovum and cleavage of the embryo, and transfer of the embryo to the uterus. Tubal pathology impairs functions of the fallopian tube and reduces fertility. Hysterosalpingography (HSG) is often performed as a first line approach to assess tubal patency and the presence of adhesions; however, HSG has limitations in detecting tubal pathology. In present study, we evaluated the significance of laparoscopy in determining the optimal management plan for infertile patients with suspected tubal pathology revealed by HSG. Technically, the major advantages of laparoscopic surgery is that it provides adequate visualization of the entire abdominal cavity and localization of pathology, allows more precise irrigation of peritoneal cavity under pressure. It also averts delays in instituting appropriate surgical management and avoids extensive pre-operative studies. These, together with reduced morbidity, smaller, cosmetically acceptable wounds and early recovery will continue to be the major driving force to its wide-spread use and demand. In developing countries with high rates of pelvic inflammatory disease resulting in tubal infertility diagnostic laparoscopy provides a cost effective and accurate means of diagnosis of various pathologies responsible for infertility. The present study shows abnormal pelvic findings in 74% cases of infertility. The mean age group of women was 21 – 30 years. This is consistent with the observation of **Sholapurkur series.** According to Kanal Sharma's study maximum cases of infertility (45%) are in the age group of 21 – 25 years followed by 35% of cases of infertility in the age group of 26 – 30 years. Maximum number of patients (46.67%) presented with less than 6 years of infertility. Ovarian pathology and tubal blockage were found to be the most common cause of infertility i.e. 56% followed by pelvic adhesions. Cystic ovaries, endometriosis, uterine myoma, genital tuberculosis and hypo-plastic uterus were also seen. These findings were similar to the study conducted in Thailand by **Sinawat et al [4].** Laparoscopy combined with Hysterosalpingography (HSG) is more effective method to reveal tubal blocks. However, its wide-spread use is still being restricted by the necessity for special expertise in minimal access surgery, issues related to the necessary infrastructural facility adjustments to the apparent high-tech equipments and operating room set-up.

CONCLUSION

The position of diagnostic laparoscopy in current fertility practice is still under debate. Until recently, laparoscopy was the final diagnostic

Procedure of the female fertility exploration, as outlined by the American Fertility Society in 1992 and by the World Health

Organization guidelines (Rowe et al., 1993). In 1997, Glatstein et al. (1997) reported that 89% of all reproductive endocrinologists in the USA routinely performed a laparoscopy in the diagnostic work-up of infertility. However, some investigators showed that the diagnostic laparoscopy did not reveal any pathology or only minimal and mild endometriosis in 40–70% of all cases (Forman et al., 1993). Already by the mid-1990's, the test 'diagnostic laparoscopy' failed to be an ideal predictor for infertility (Collins1995). These findings convinced some authors to challenge the need for this procedure in the work-up of infertility (Fatum et al., 2002). Worldwide, diagnostic laparoscopy is increasingly bypassed by IVF clinics in an effort to be cost-effective on the one hand and on the other hand, to protect patients from possible hazards of surgical complications and general anesthesia. Disadvantages of diagnostic laparoscopy include the need for general anesthesia, patient's anxiety and the possibility of adhesion formation. In a large Finnish follow-up study, the complication rate of diagnostic laparoscopy was 0.6 per 1000 procedures

(Ha¨rkki-Sire´n et al., 1999). However, advantages include the possibility to perform both diagnosis and therapy at the same time, and the opportunity to combine the laparoscopy with the hysteroscopic exploration of the uterine cavity. Laparoscopy along with HSG is very effective method in evaluating cases of primary infertility especially tubal blockage. Further studies are needed to investigate the etiologies of these abnormalities at the earliest this could be a measure to bring down the occurrence of such conditions. It should be appreciated that HSG and Laparoscopy are complimentary rather that competitive procedures. The accuracy of diagnosis is enhanced when two procedures are combined especially in those cases where the result of one of the tests is doubtful. In the days of modern gynecology, salpingoscopy and falloscopy via hysteroscope are the alternatives available for assessment of tubal patency. In conclusion, there is undeniable evidence that laparoscopic surgery for the management of infertility is a feasible, safe and effective challenging alternative to open surgery (7,8). Its added value in reduced morbidity, shorter hospital stay and cosmesis has helped to establish

its place in contemporary and future gynecologic practice. The use of laparoscopy in pregnancy needs further studies to establish safety for both the baby and pregnant woman.

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