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Original Research Article

A study on laparoscopic sterilisation using 5mm laparoscope and direct trocar entry method

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ABSTRACT

Background: Laparoscopic sterilization is a widely accepted method of permanent contraception. The techniques of abdominal entry are open direct trocar and veress method. The objectives of this study were to performance and practice of 5mm direct trocar entry techniques in Laparoscopic sterilization. To prepare a list of benefits and complications.

Methods: Retrospective analysis of patients who underwent direct 5mm trocar entry for laparoscopic sterilization. Period: 1st April 2017 to 30th November 2017. Patient came on the day of surgery with empty stomach. Intravenous pethedine 50mg and phenergan 12.5mg and antibiotics were given. Injection lignocaine intraumbilically and incision of 5mm was made. 5mm trocar and canula inserted directly. 5mm scope inserted. After ensuring peritoneal cavity, pneumoperitonium created. Secondary 7mm port made under vision and ring applicator inserted and fallop ring applied on both tubes. Port closure done by N Butyl 2 cyano accrylate. Patient was observed for 6 hours and discharged with analgesics and antibiotics.

Results: We operated 220 interval sterilizations and 31 posts MTP. In 250 cases, the method was successful. Only in one woman 5mm trocar was insufficient to make peritoneal entry since the patient was morbidly obese. Hence 10mm trocar was used.

Conclusions: Laparoscopic tubal sterilization can be done with 5mm laparoscope and direct trocar entry method is safe and saves time.

Keywords: Direct entry, Laparoscopy, n-butyl 2 cyano acrylate, Sterilization, Veress needle, 5mm trocar

INTRODUCTION

Samuel Smith Longron of Ohio in 1880, is credited with having performed the first tubal sterilisation, along with caesarean section. But the availability and acceptability of tubal sterilisation as a method of fertility control remained limited until the mid-20th century. In the 1970s worldwide popularity of tubal sterilisation increased tremendously as a permanent method of contraception for women. This occurred concurrently with the widespread availability of laparoscopy. Hence laparoscopic tubal

sterilisation by applying silastic rings became popular by virtue of its safety, reduced recovery time and better cosmetic results.¹

Newer endoscopic equipment and techniques enables the use of small size scopes and faster surgery.^{2,3}

The objectives of this study were to evaluate the performance, safety and early outcomes of the surgical technique. To analyse the age group and important risk factors

METHODS

We conducted a retrospective study of all laparoscopic sterilisations done during the period, April to November 2017.

The study conducted at family welfare unit, department of obstetrics and gynaecology, Government Medical College, Kozhikode, Kerala, India. This was a record based study. Prior approval was obtained from Institutional Research and Ethics Committee. Women who opted for laparoscopic sterilisation as a permanent method of contraception were selected.

Inclusion criteria

- Women requesting laparoscopic sterilization as an interval procedure (>6 weeks after abortion or delivery)
- Women in the first trimester of pregnancy who wanted laparoscopic sterilization along with termination of pregnancy
- These women should satisfy the eligibility criteria for sterilization under National Family Welfare guidelines.

Exclusion criteria

- Women with medial illness in whom laparoscopy is contraindicated
- Hb <10gm%
- Presence of pelvic infection
- In women with 1st trimester pregnancy presence of any contraindication for termination of pregnancy.

The In selected patient a detailed history was taken and clinical examination was done. The investigations done were blood Hb, group and Rh, blood sugar, screening tests and urine RE. Patients were taken for surgery if the investigations were within normal limits. After selecting, the surgical technique and complications were explained. Informed consent was taken from patient and husband.

Patients were asked to come on the surgery day. Premedication Inj. Pethidine 50mg and Inj Promethazine 12.5mg was given intravenously 5 minutes before the surgery.

Patients were kept in the dorsal lithotomy position with legs on stirrups. A bimanual examination was done. Abdominal and perineal area cleaned with Povidone Iodine. Bladder was catheterized and uterine manipulator inserted. Surgeon standing on left side, local anaesthetic drug, 2% lignocaine without adrenaline is injected in the umbilical area. An intraumbilical incision of 5mm is made. Abdominal wall is lifted and 5mm trocar with cannula inserted by direct puncture.⁴ A straight, 30 degree 5mm telescope with light source is introduced. After ensuring peritoneal entry pneumoperitoneum was created with CO₂ and endocamera fixed. Uterus, both

Fallopian tubes and ovaries were visualized. Then a secondary port of 7mm is done under direct vision preferably on the left side 1 inch above and medial to the anterior superior iliac spine. Through that port a Ring applicator preloaded with 2 silicone rings is inserted. Fallopian tubes brought into view by manipulating the uterus. Grasping tongs are introduced from the applicator barrel. One of the tongs is used to gently hook and elevate the isthmus portion of the tube. The tongs were then retracted into the ring applicator, which closes both arms of the tongs around the grasped tube while pulling the loop of the tube into the applicator.

Immediate complications looked for were extra peritoneal insufflation, tubal serosa tear, transection of the tube, mesosalpinx tear and haematoma formation, omentum and bowel and vascular injury. Early complications were that seen before discharge.^{4,5}

Haemostasis was ensured and ports taken out in vision. Skin closure was done by sticking an adhesive plaster with n-butyl 2 cyano acrylate.

In women who had intra-abdominal adhesions, due to previous caesarean section or any other abdominal surgeries, the secondary port is made on an a vascular site under vision either on left or right side of abdomen. After the surgery, patients were observed for four hours and sent home. Antibiotics and analgesics were prescribed. A review was done after one month.

Instruments

- Metallic reusable trocars of 5mm and 7mm diameter
- 5mm laparoscope 30 degree
- Ring applicator
- Size 11 scalpel
- Gamma sterilized silastic ring manufactured by Hindustan Lifecare Limited. Port closure plasters.
- A reusable veress needle also included.
- Endocamera system (6) Pneumo insufflator of Karl Storz (Germany).

Statistical analysis

Statistical analysis was done using MS Excel. Data was expressed as frequency and percentages.

RESULTS

Majority of the patients were in the age group of 20-30 years.

We had 220 women for interval sterilisation. 31 patients were pregnant and underwent termination of pregnancy before sterilisation. Majority of the women had two or three children. In 250 patients we entered the peritoneal cavity by direct puncture inserting a 5mm trocar and cannula and proceeded with surgery. In one obese woman

5mm trocar length was insufficient to traverse through the abdominal wall and hence we used 10mm trocar and cannula. There were 5 patients with previous CS, but no difficulty was encountered due to adhesions. In our series we did not have complications like tubal or mesosalpinx tear or injury to other organs. Sterilisation could be done on both Fallopian tubes.

Table 1: Age distribution.

Age in years	Number	Percentage
22-30	150	59.5
31-35	69	27.6
<36	32	12.7

We have noted a few advantages - The average surgery time was less (5 minutes) than the veress needle method. Hence the patients were more comfortable.

- We found satisfactory pain relief with oral analgesics
- The picture clarity was good and comparable to 10mm
- We did not do fascia repair for 5mm ports as the manipulation was minimal
- Procedure was completed as day care and patients went home in the evening
- The cost of 5mm trocar and laparoscope was less and maintenance of equipment was easier.

DISCUSSION

In this study we used direct trocar entry for accessing the peritoneal cavity. The entry with 5mm trocar is easy and needs less force.

Byron JW, in his study of two hundred and fifty-two women had no major complications associated with either direct or verres needle entry technique.⁶ Minor complications (preperitoneal insufflation, failed entry or more than three attempts necessary to enter the peritoneal cavity with the trocar) were significantly more frequent ($p < 0.05$) in the Verres needle technique group. 113 of these patients underwent sterilization. The time saved using the direct insertion technique is explained by a significant ($p < 0.01$) reduction in the mean laparoscope insertion time, which was 2.2 minutes and 5.9 minutes for the direct insertion and Verres needle techniques, respectively. Our results were also comparable. We prefer the direct insertion technique for trocar placement.

Borgatta L, in a randomized, prospective trial designed to compare direct trocar insertion with prior peritoneal insufflation with the Verres needle for laparoscopic tubal sterilization, stated that Direct trocar insertion resulted in fewer instrument insertions (21.8% versus 7.8%) and use of smaller volumes of CO₂ (2.67 versus 2.32L).⁷ Direct trocar use resulted in a decrease in operating time from 9 minutes, 40 seconds in the needle group to 7 minutes, 30 seconds in the trocar group. Minor omental injuries

occurred in a small percentage of each group, while serious complications occurred once in each group.

Dimitrios K, states that reusable instruments can be dismantled and washed and sterilized with much less cost.⁸ We also used metallic trocar and cannula after autoclaving. The instruments lose sharpness after repeated use and more force is necessary for insertion, this may cause injury to the vessels in direct entry. However a controlled force and directing the trocar towards the pelvis helped us to avoid injury to vital organs. This study had parous women with a lax abdominal wall, hence entry was done without much difficulty. Similar to his study we did not find any infection with on the abdominal wall or inside.

Yamamoto M, in his meta-analysis reported that trocar size <10mm do not require fasciae closure. Expert opinion and small case report suggests that in cases of prolonged manipulation of 5mm trocar sites, the surgeons would consider fasciae closure because of extensions of initial incision. Since our manipulations were less, extension of the incision and tearing of muscle fibres did not occur. Suturing of port site was not done. We did not see any immediate complication.

Khurshid et al, published a case report of bowel herniation detected while closing the 5mm port.¹⁰ Concluded that Bowel herniation can occur through a 5mm port. All port sites should be closed to avoid such complications.

A study by Huber et al that reviewed 27,653 women undergoing sterilization in Switzerland concluded that laparoscopic sterilization, whether performed as an interval or postpartum procedure, is superior over a postpartum mini-laparotomy in terms of major and minor complications.

DL Prince, reported that laparoscopic sterilization in the post partum period (72 hours) is feasible.¹¹ But in India laparoscopic sterilisation can be done only as interval or post abortal procedure. In our state women opt for sterilization after second or third delivery. Hence it is only prudent that we do permanent sterilization a few months or years after delivery.

Strength of the study

This was the first time we assessed the advantages of the above technique. We have seen that less experienced surgeons in District level hospitals can safely perform the above procedure. It is practical to have low cost laparoscopy set with reusable instruments.

CONCLUSION

Laparoscopic tubal sterilisation can be done with 5mm laparoscope and direct trocar entry method is safe and saves time.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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