MAJOR COMPLICATIONS OF LAPAROSCOPY IN 7,478 CASES†

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Laparoscopy, the so called "Band-Aid Surgery" is considered as a safe and simple procedure. However, as increasingly large number of patients are undergoing laparoscopy, a proportionately larger number and variety of complications are being observed.

Laparoscopy procedures are being performed at the KEM Hospital, Bombay, since 1972. A total number of 7,478 such procedures have been analysed for discussing the major complications encountered. Of these 7,478 laparoscopic procedures, 2,466 have been silastic ring sterilisations carried out in rural camp settings —during the last one and a half year. Of the remaining 5,012 procedures carried out in the KEM Hospital, 4,108 were diagnostic and 904 were laparoscopic sterilisations.

General anaesthesia with endotracheal intubation has been utilised for most of our hospital cases. However, a large number of sterilisations have been performed under local anaesthesia with pre-operative sedation. Diagnostic laparoscopy is, however, preferably done under general anaesthesia.

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About fifty per cent of these procedures have been carried out by the resident staff including the house surgeons.

Carbon dioxide has been the most commonly employed gas for establishing pneumoperitoneum. The insufflator used has been the Wisap's model with gauge showing the pressure at which the gas is infused and also the total volume infused. The use of air compressor for infusing atmospheric air in the peritoneal cavity has generally been restricted to the rural camps, wherein about 300 cases have been performed without any hazards. We do not advocate the use of air for pneumoperitoneum and it is only the lack of equipment coupled with the extremely large number of patients desiring sterilisations at the rural camps, that has forced us into using air for pneumoperitoneum.

We have encountered 17 major complications in these 7,478 procedures (2.2 per 1,000) Table I.

Discussion

Extensive subcutaneous emphysema occurred in 1 of our cases. Cul-de-sac insufflation can be resorted to in these cases where there is difficulty in establishing pneumoperitoneum due to subcutaneous emphysema. Obese patients as well as those with history of previous laparotomy scars can also be insufflated through this route.

We do not have any experience with direct trocar placement, though Dingfelder

TABLE I

1. Extensive subcutaneous emphysema	1
2. Omental haematoma requiring exploration	1
3. Cautery burns to bowel	3
4. Bleeding from mesosalpinx with tubal transection requiring laparotomy	5
5. Silastic ring application of small bowel	1
6. Injury to small bowel by trocar	1
7. Injury to ureter during gonadal biopsy	1
8. Esophageal intubation—leading to death	1
9. Flare-up of pelvic inflammatory disease	2
10. Loss of scalpel blade in peritoneal cavity	1
Total	17

(1978) has documented his small series of 301 such cases of direct trocar placement without any complications.

Omental haematoma by Verres needle was seen in 1 case which was big enough to necessitate a laparotomy for its evacuation and ligation of the injured vessel.

The other major complications of establishing pneumoperitoneum like gas embolism and major vessel injury were not observed by us.

Penfield (1978) gives details of 1 patient, where the Verres needle injured the abdominal aorta and also the iliac vessels —the patients required 22 units of blood, a dacron graft on the aorta and the surgeon is facing a malpractice suit of about half a million dollars. He also mentions of a patient who developed gas embolism through a Verres needle placed in the commol iliac vein.

Wadhwa *et al* (1978) in their experience of 5,266 laparoscopic procedures find the incidence of gas embolism to be extremely low. Hasson (1977) has been advocating the routine use of his "Open Laparoscopy" technique to avoid these complications, but his procedure is not yet widely practised. His series of 800 patients with only 1 major complication of small bowel incision is fairly impressive.

During our initial years when a visiting team brought the unipolar cautery equipment for demonstration and teaching, we encountered 2 cases of bowel burns during laparoscopic cautery sterilisation. One of these recovered after an exploratory laparotomy but the other succumbed to generalised peritonitis inspite of repair of the bowel burn. A serosal burn on the large bowel occurred during an ovarian biopsy and required closure of the defect. Cautery burns to small bowel during sterilisations have been reported in large numbers all over. Wheeless (1978) while reviewing 7,350 cases of electrosurgery has observed 14 patients of bowel burns—an incidence of 0.19 per cent.

Unipolar cautery has been primarily responsible for these burns. The use of bipolar cautery pioneered by Rioux and Cloutier (1974) and the thermal cautery of Semm is considered much safer and except for an isolated unpublished case there have been no other cases of bowel burns associated with the use of bipolar cautery.

We however, almost entirely switched over to the silastic rings. Silastic rings and its applicators are now freely available indigenously at a low cost and have proved to be much safer than the cautery.

The necessity of a proper technique for silastic ring application cannot be over emphasised. If the tube is held too close to the cornual end, or if the prongs hold a lot of mesosalpinx alongwith the tube, transection of the tube with bleeding from the

mesosalpinx is a real possibility. Thickened and oedematous tubes also lead to similar problems. During our initial expecience with the silastic rings, whenever a tube was thus transected, we resorted to laparotomy to handle this situation. This was necesary in 5 of our cases. Now-a-days with increasing experience, we do not create this problem often, and in cases where it occurs, we manage it by the application of silastic rings on the two cut ends of the tube which achieve haemostasis as well as block the tube effectively. Another complication of silastic ring encountered was a wrongly applied silastic ring on the small bowel and a laparotomy was necessitated to remove this. Poliakoff *et al* (1978) and others reported a similar case of ileal application in which the misplaced ring was removed after a laparotomy.

In the last two years we have performed over 2,500 silastic ring sterilisations and in no case was a laparotomy necessary, thus supporting Yoon *et al* (1947) claim that it is a safe, simple and effective method of sterilisation.

Injury to small bowel during trocar placemelt occurred in 1 case. This was diagnosed immediately by visualisation of the bowel mucosa. As exploration with repair of the injured wall was followed by an uneventful post-operative recovery. This patient had bowels adherent to the parietal peritoneum due to abdominal Koch's infection. This being a common condition in our country, such complications may be encountered and cases with a strong suspicion of the same should be subjected to a laparoscopy with due care.

A trocar has a potential for creating major vascular injuries and is one of the most dreaded complications. Penfield (1978) mentions about his knowledge of 100 such cases, most of them undocumented and some in the hands of experienced laparoscopists. We have, however, yet to encounter a major vascular iljury by the trocar. This complication has been attributed to the following factors by Penfield (1978):

(1) Inexperience and carelessness, (2) Blunt trocar, (3) Patient not in Trendelenberg position, (4) Failure to elevate the abdominal wall, (5) Perpendicular insertion of Verres needle and trocar, (6) Inadequate pneumoperitoneum, (7) Forceful arm and shoulder thrust during trocar insertion (8) Failure to locate anatomic landmarks.

Injury to ureter during biopsy for streak gonads through the laparoscope has been a recognised complication and 1 of our patient sustained such an injury which was immediately recognised and treated.

In 1972, we had a very unfortunate accident when an endotracheal tube was misplaced in the oesophagus, a cardiac arrest occurred and inspite of the best possible efforts at resuscitation, the patient could not be revived. Local anaesthesia with pre-operative sedation has been found to be fairly useful especially in laparoscopic sterilisations.

We performed 5 laparoscopic procedures in our patients of acute pelvic inflammatory disease to assess the degree and extent of the infection in the pelvis. Two of these 5 patients showed a marked flaring of the infection inspite of antibiotic cover following the laparoscopy. These 2 patients survived after a prolonged and stormy period. We have since discontinued the use of laparoscopy in diagnosed cases of acute pelvic inflammatory disease.

The last complication in our series i.e. the loss of scalpel blade in the peritoneal cavity necessitating a laparotomy for its removal is indeed the most unusual of all complications.

An ill-fitting blade on a scalpel handle, an extremely thin patient and probably an over-enthusiastic surgeon led to this complication. As the initial stab was made to incise the skin prior to introduction of the Verres needle, the depth achieved was more than the required and as the handle was pulled out, the blade got detatched and fell into the peritoneal cavity. A laparoscope was then introduced after establishing a pneumoperitoneum and the blade was seen lying over the omentum covering the bowel. A long haemostat was introduced an extension of the initial incision and the blade was caught with this haemostat with the help of laparoscopic visualisation. But, as attempts were made to wriggle out the blade through the anterior abdominal wall it broke into two pieces and fell back again in the peritoneal cavity. A laparotomy was then performed to recover these two broken pieces of the blade.

Thus we had a total of 17 major complications in 7,478 laparoscopic procedures —a rate of 2.2 per 1,000. There were two deaths giving a mortality rate of 26 per 100,000.

Edgerton and Kleppinger relating their experience of major complications secondary to 7,270 laparoscopic procedures, report a major complication rate of 5.9 per 1,000 and a mortality rate of 13 per 100,000.

The mortality rates reported from the survey of A.A.G.L. has been very impressive. They report only 6 deaths in 226,464 patients who had undergone a laparoscopy during the years 1975 and 1976—a mortality rate of 2.6 per 100,000. Similarly Chamberlain *et al* (1978) Confidential Enquiry into Gynaecologic Laparoscopy from U.K. report 4 deaths in 50,247 laparoscopies—a rate of 8 per 100,000.

To conclude, though laparoscopy is a safe, simple and a very useful procedure, it should be carried out when indicated after good clinical evaluation and with full awareness of the possible complications and making all efforts to minimize them.

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References

1 Chamberlain, G. V. P. (Chairman) and Carron, B. J. A., et al: Report of the Working Party of the Confidential Enquiry into Gyenecologica lLaparoscopy. Brit. J. Obstet. Gynec. 86: 401, 1978.
2. Dingfelder, J. R.: J. Reprod. Med. 21: 45, 1978.
3. Edgerton, W. and Kleppinger, R..: Laparoscopy, Edt. Phillips, J. M., Baltimore, 1977, Williams & Wilkins Co., p. 265.
4. Hasson, H. M.: Laparoscopy, Edt. Phillips, J. M., Baltimore, 1977, Williams Wilkins Co., p. 145.
5. Penfield, J. A.: Endoscopy in Gynecology, Edt. Phillips, J. M., St. Louis, 1978, A.A.P.L., p. 301.
6. Poliakoff, S. R., Yoon, I. and King, T. M.: Endoscopy in Gynecology, Edt. Phillips, J. M., St. Louis, 1978, A.A.G.L., p. 204.
7. Rioux, J. E. and Cloutier, D.: Am. J. Obstet. Gynec. 119: 737, 1974.
8. Semm, K.: Endo-coagulation: A new field of Endoscopic Surgery: J. Reprod. Med. 16: 195, 1976.
9. Wadhwa, R. K., McKenizie, R. and Wadhwa, S. R.: Anaesthesiology. 48: 74, 1978.
10. Wheeless, C. R.: Endoscopy in Gynecology, Edt. Phillips, J. M., St. Louis, 1978, A.A.G.L., p. 3117.
11. Yoon, I., King, T. M., Parmley, T. H.: Am. J. Obstet. Gynec. 127: 109, 1977.