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Major complications of diagnostic laparoscopy and laparoscopic tubal resection at King Chulalongkorn Memorial Hospital: 10 years review

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Aim : *To study the major complications of diagnostic laparoscopy and laparoscopic tubal resection in King Chulalongkorn Memorial Hospital*

Design : *Descriptive study*

Materials and methods : *The medical records of 9,036 cases undergone diagnostic laparoscopy and laparoscopic tubal resection during January, 1991 to December, 1995 were reviewed. Age, major complications and factors related were reviewed.*

Results : *The mean age was 32.58 ± 5.5 years. Diagnostic laparoscopy were performed in 7,481 cases. Laparoscopic tubal resections were performed in 1,555 cases. Major complications were 26 cases (0.29 %). These included : bowel injuries 10 cases (0.11%), ureteric injuries 2 cases (0.02 %), vascular injuries 1 case (0.01%), hypotension 10 cases (0.11%) and apnea 3 cases (0.03 %).*

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In these cases, ureteric injuries, vascular injuries were related to inadequate sedation due to the inappropriate doses of sedatives and narcotics. Hypotension and apnea were related to higher dose of combined benzodiazepines and narcotics. Most cases of bowel injuries related to the trocar insertion technique and patient selection.

Conclusion : *The incidence of major complications in diagnostic laparoscopy and laparoscopic tubal resection may be related to poor patient selection and inappropriate anesthetic techniques due to the lack of anesthesiologist to give proper anesthesia. The improvement of patient selection and anesthetic techniques should be considered for the patient safety.*

Key words : *Major complications, Diagnostic laparoscopy, Laparoscopic tubul resection.*

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วัตถุประสงค์ : *เพื่อศึกษาถึงภาวะแทรกซ้อนชนิดรุนแรงในการผ่าตัดผ่านกล้องเพื่อการวินิจฉัยและการทำหมัน*

รูปแบบการศึกษา : *การวิจัยเชิงพรรณนา*

วัสดุและวิธีการ : *ทำการทบทวนประวัติการผ่าตัดผู้ป่วย 9,036 ราย ที่ทำการผ่าตัดผ่านกล้องเพื่อการวินิจฉัยและการทำหมันระหว่างวันที่ 1 มกราคม 2534 ถึง 31 ธันวาคม 2543 ทำการทบทวนอายุ ภาวะแทรกซ้อนที่พบชนิดการผ่าตัดและวิเคราะห์สาเหตุที่เกี่ยวข้อง*

ผลการศึกษา : *อายุเฉลี่ย คือ 32.58 ± 5.5 ปี มีการผ่าตัดผ่านกล้องเพื่อการวินิจฉัย 7,481 ราย การทำหมันผ่านกล้องฯ 1,555 ราย ภาวะแทรกซ้อนรุนแรง 26 ราย (0.29%) ได้แก่ บาดเจ็บต่อลำไส้ 10 ราย (0.11%) บาดเจ็บต่อท่อไต 2 ราย (0.02%) บาดเจ็บต่อเส้นเลือด 1 ราย (0.01%) ความดันโลหิตต่ำ 10 ราย (0.11%) และหยุดหายใจ 3 ราย (0.03%) ในจำนวนเหล่านี้ การบาดเจ็บต่อท่อไต ต่อเส้นเลือดเกิดจากผู้ป่วยขยับตัวไปมาขณะผ่าตัด จากการดมยาสลบที่ไม่ลึกพอความดันโลหิตต่ำและหยุดหายใจเกิดจากยาฉีดระงับปวดและยาคลายกังวล ภาวะแทรกซ้อนจากการบาดเจ็บต่อลำไส้ส่วนใหญ่เกิดจากการคัดเลือกผู้ป่วยที่ไม่เหมาะสม*

สรุปผลการศึกษา : *พบอุบัติการณ์ของภาวะแทรกซ้อนชนิดรุนแรงในการผ่าตัดผ่านกล้อง ฯ เพื่อการวินิจฉัยและการทำหมันมีสาเหตุส่วนใหญ่เกิดจากการคัดเลือกผู้รับบริการที่ไม่เหมาะสมและการดมยาที่ไม่เพียงพอและไม่เหมาะสม การพัฒนาการคัดเลือกผู้รับบริการและการดมยาสลบโดยให้วิสัญญีแพทย์และวิสัญญีพยาบาลในการดูแลผู้ป่วยขณะผ่าตัดจะช่วยให้เกิดความปลอดภัยยิ่งขึ้น*

The applications of laparoscopy have been extendedly employed from a simple diagnostic tool of pelvic pathology to tubal sterilization and not until previously, the treatment of multiple intrabdominal diseases. Similar to many surgical interventions, laparoscopic procedures can be complicated by infections, traumatic or hemorrhagic morbidities. Problems associated with visualization of the operative field, together with the change in anatomical perspective may increase the likelihood of damage to blood vessels or vital structures such as the bowels, the ureters, or the bladder. There were many reports of the incidence of 1- 4 % and 0.3 to 2.8 %, respectively.[1-5] In Germany, after development of new instruments in the field such as bipolar techniques, there were reports of an inclination of the incidence from 0.09 % (1949 -1977) to 0.008% (1986 -1988). The serious complication started at 3.56 % (1949-1977), but now ranged between 1.93 to 2.36 %.[6] The complications can be classified as major or minor. Major complications are namely, death, or severe injury that mandates a laparotomy or termination of the procedure. The lowest incidence of death was 0.057 per 1000.[7] Otherwise it was reported as ranging from 0.08-0.2 per 1000.[8-10]

Injury that requires laparotomy occurred in 4.2 per 1000.[7, 11] Minor complications where the injury or problems were dealt with laparoscopy and definitive procedure proceeded. It was impossible to quote the incidence of such complications.

Diagnostic laparoscopy and laparoscopic tubal resection were the two most common laparoscopic procedures practiced at King Chulalongkorn Memorial Hospital. Up until now, there was no report of major complication of the procedures in Thailand. The aim of this study was to review the incidence of major complications and their related factors.

Materials and methods

Medical records of 9,036 cases who underwent diagnostic laparoscopy and laparoscopic tubal resection, during January, 1991 to December 2000, were reviewed. The patient's age, major complications and related factors were records.

Laparoscopic diagnosis and tubal resection was performed under anesthesia : diazepam (0.2-0.3mg/kg BW); Meperidine (2 mg/kg) was also given intravenously followed by plain 1% Xylocaine (10 ml) infiltrated at the site of the incision. After 1997, diazepam was changed to midazolam (0.1-0.15 mg/kg. BW). Blood pressure, pulse and respiratory rate were recorded at: 0, 5, 10, 15 minutes, respectively, after the drug administration, and there after every 30 minutes. Immediately, when the procedure was complete, the patients were transferred to recovery room for further observation .

Results

Diagnostic laparoscopy was performed in 7,481 cases. Laparoscopic tubal resections were performed in 1,555 cases. Major complications were 26 cases (0.29 %)

Table 1. Major complications (N=9,036).

Complications	n (%)
Bowel Injuries	10 (0.11)
Ureteric Injuries	2 (0.02)
Vascular Injuries	1 (0.01)
Hypotension (Systolic blood pressure dropped below 20 % of baseline)	10 (0.11)
Apnea	3 (0.03)
Total incidence =	26 (0.29)

Bowel injuries (10 cases)

Seven cases had a history of previous laparotomy. The metallic trocars without the safety tip were used in 5 cases. Disposable trocars with were safety tip were used in 5 cases. Seven cases were performed by third years resident and 3 cases by faculty staff. Sites of bowel perforation were at the small bowel 8 cases (80 %) and transverse/descending colon in 2 cases (20 %). The treatment was laparotomy with simple closure in 8 cases (80 %) and colostomy in 2 cases (20 %). Immediate diagnoses were noted in 6 cases (60%) while there were 4 cases (40 %) of 48 hours-delayed diagnoses .

Ureteric injuries (2 cases)

Both cases were injured during electric cauterization. One case developed right urinoma on the second day after the operation. The operator did not notice the injury. The patient moved back and forth during the operation because of her inadequate sedation. She later required laparotomy to repair her fistula. In the other case, the operator detected the injury. She was treated conservatively.

Vascular injury (1 case)

There was one case of accidental tear of venous plexus at the pre-sacral area during trocar insertion. The patient moved back and forth during trocar insertion due to inadequate anesthesia. Exploratory laparotomy to repair the vessels and stop bleeding was required.

Hypotension (10 cases)

Hypotension (Systolic blood pressure dropped below 20 % of the baseline) after intravenous injection of benzodizepine and narcotics was noted. Fluid resuscitation and vasoconstrictor agents were given. The operators were not able to continue the operations.

Apnea (3 cases)

Apnea after intravenous injection of benzodiazepines and narcotics was noted. One hundred percent oxygen with positive pressure ventilation in combination with fluid resuscitation with vasoconstrictive agents were given.

Discussion

From our study, we found the rate of bowel injury (0.11 %) similar to other reports (0.16 - 0.18 %)[9,12] From literature review,[13-17] the rate of injury increased in patients with inadequate umbilical incisions, uncontrolled sudden entry of the trocar, blunt trocar, intestinal obstruction, previous intestinal surgery, previous lower abdominal incision scars, obesity and extremely thin.[13-17] From our data, previous surgery was noted in 7 cases. Patient should be carefully selected for contraindications. In cases of previous surgery that required diagnostic laparoscopy, open technique and other modifications[18-21] should be done to avoid bowel injuries. We confirmed the -non-safetiness of the "Safety" disposable trocars, since we found 5 cases of bowel injuries using trocar with safety tip.

Even in the hands of the experienced staff of our department, we still found the bowel injury in 3 cases. We recommended a careful selection of the patients to avoid such complication. We found 2 cases of ureteric injuries during cauterization. Only one case was detected during the operation. The others were detected after the complication already occurred. In one case of pelvic endometriosis, the cauterization should be more meticulous. The continuous attention to the location of the ureter will reduce these complications.[22] The vascular injury in our series was

related to the inadequate anesthesia. The injury occurred during trocar insertion and accidentally injured the pre-sacral vessel plexus. The ureteric injury and the vascular injury were related to the inadequate anesthesia. The hypotension and apnea were related to the intravenous narcotics combined with benzodiazepines.[23-24] This combination can cause vasodilatation and respiratory depression.[13-24]

Hypotension may be caused by the sudden raised intra-abdominal pressure (due to abrupt venocaval compression reducing venous returns). Hemorrhage and gas embolism. Prompted controlled ventilation with 100 % oxygen, fluid resuscitation and vasoconstrictive agents were required. There was a report of the use of ketamine hydrochloride without the risk of such side effects.[25] But there was the high rate of excitation phenomenon which made this method less popular.[25]

At King Chulalongkorn Memorial Hospital, there was no anesthesiologist or anesthetist to provide anesthesia. The operator had to use sedation technique. So we can found the inadequate anesthesia due to the inadequate and improper dose of narcotic and benzodiazepine. To provide the adequate anesthesia, higher doses of medication should be required. These can create the problem of vasodilatation and respiratory depression. To avoid these problems and its complications, we stressed the need of having the anesthesiologist in the operative room for laparoscopic diagnosis and laparoscopic tubal resection for the safety of patient as the standard service.

Conclusion

The incidence of major complications in diagnostic laparoscopy and laparoscopic tubal resection may be related to the poor selection of the patients and inappropriate anesthetic techniques, due to the lack of anesthesiologist to give proper anesthesia. The improvement of patient selection and anesthetic techniques should be considered as the patients' safety.

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