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Original Research Article

Comparative study of peri-operative outcome following laparotomy versus laparoscopic technique of abdominal hysterectomy for benign gynaecological lesions

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ABSTRACT

Background: Laparoscopic technique of hysterectomy is becoming increasingly popular in developing and developed world. Laparoscopic hysterectomy is a minimal access procedure that allows patients to recover faster. The study was undertaken to assess the impact of two abdominal techniques (laparoscopic and conventional laparotomy) on various variables like operative time, hospital stay, complications and convalescence period.

Methods: An observational longitudinal study was carried out at tertiary care centre. Two hundred and ten women, as per inclusion and exclusion criteria, who had undergone abdominal hysterectomy for benign uterine pathology, either by laparotomy (Group A) or by laparoscopic technique (Group B) during study period were included. Data was analyzed and compared by using different variables between two methods of hysterectomy, using percentages and Chi square test for normal distribution. P value less than 0.05 was considered significant.

Results: The mean duration of surgery was 100 minutes in group A and 175 minutes in Group B. There were two cases (1.90%) of minor injury to urinary bladder in Group A and one case (0.95%) of thermal injury to urinary bladder in Group B. The mean blood loss was around 240 ml and 70 ml in Group A and B respectively. The need for postoperative analgesia was observed in 100% cases from Group A and 38.09% from group B. The average duration required for out of bed ambulation was 25 hours and 14 hours in Group A and B respectively. The mean hospital stay in group A and B was 7.5 days and 3.5 days respectively.

Conclusions: Following laparoscopic hysterectomy, women had less morbidity, less need for post-operative pain relief, had early ambulation, short hospital stay and early resumption of routine activities at home as compared to women who had undergone abdominal hysterectomy by conventional method.

Keywords: Abdominal hysterectomy, Complications of hysterectomy, Laparoscopic hysterectomy, Surgical site infections

INTRODUCTION

Hysterectomy is one of the most frequently performed operations in Gynecology. Traditionally the uterus has been removed by an abdominal or vaginal route. In spite of the lower complication rate in vaginal hysterectomies, abdominal hysterectomy has been the main method of

hysterectomy in the developed countries.¹⁻⁵ Laparoscopic hysterectomy (LH) is an innovation in the Gynaecologist's armamentarium. It is a minimal access procedure that allows patients to recover faster. Approximately 6,00,000 hysterectomies are performed annually in the United States, of which 70% are performed by the abdominal route.^{6,7} In some countries

the rate is as high as 95%.⁸ However, the laparoscopic approach is clearly superior to laparotomy.^{7,8} The advantages of laparoscopic hysterectomy over abdominal hysterectomy have been reported to be less postoperative pain, shorter hospital stays and more rapid return to normal activities and work.^{9,10} The study was undertaken to assess the impact of two abdominal techniques (laparoscopic and conventional laparotomy) on various variables like operative time, hospital stay, complications and convalescence.

METHODS

An observational longitudinal study was carried out at tertiary care centre over a period of 22 months. Two hundred and ten women, as per inclusion and exclusion criteria, who had undergone abdominal hysterectomy for benign uterine pathology, either by laparotomy or by laparoscopic technique during study period were included. Cases were distributed as follows.

Group A: Hysterectomy performed through laparotomy and

Group B: Hysterectomy performed by laparoscopy. Hysterectomy operation by either of the techniques was performed under general anaesthesia by same team of surgeons. Patients operated by either of the techniques received a single dose of prophylactic antibiotic in the form of Inj.Cefotaxime 1 gram and Inj.Metronidazole 500 mgs at 8am on the day of surgery. Same antibiotics were continued for seven days.

In addition to the antibiotics, all cases received anti-inflammatory drugs in the form of combination of diclofenac sodium-50 mg twice daily and tablet vitamin-C 500mg once daily from second to seventh day after hysterectomy operation.

Data related to age, indication for hysterectomy, technique of operation, duration of surgery and anaesthesia, intra-operative complications, need for post-operative nursing care, need for post-operative pain relief, duration of parenteral fluid therapy, timing of ambulation, infective morbidity, surgical site infections, hospital stay, wound related late complications and period of post-operative rest taken in hysterectomy by conventional laparotomy and by laparoscopy, was collected.

Data was analyzed and compared by using different variables between two methods of hysterectomy, using percentages and chi square test for normal distribution. P value less than 0.05 was considered significant.

RESULTS

The mean duration of surgery was 100 minutes in group A and 175 minutes in Group B (Table 1).

Table 1: Distribution of cases as per duration of surgery.

Duration of surgery (hrs)	TAH (Group A) (n=105) (%)	TLH (Group B) (n=105) (%)
<1	03 (02.80)	00 (00.00)
1-1.5	17 (16.10)	04 (03.80)
1.5-2	46 (43.80)	21 (20.00)
2-2.5	24 (22.80)	37 (35.20)
2.5-3	11 (10.40)	24 (22.80)
>3	04 (03.80)	19 (18.09)
Mean±SD	1.78±0.26	1.93±0.87

Value of $\chi^2=37.758$, $p=0.0001$, significant.

There were two cases (1.90%) of minor injury to urinary bladder in Group A and one case (0.95%) of thermal injury to urinary bladder in Group B (Table 2).

Table 2: Distribution of cases as per intra operative complications.

Intra operative complication	TAH (Group A) n=105 (%)	TLH (Group B) n=105 (%)
Injury to bladder	2 (01.90)	0 (00.00)
Injury to bowel	0 (00.00)	0 (00.00)
Primary hemorrhage	0 (00.00)	0 (00.00)
Thermal injury to viscera	0 (00.00)	1 (00.95)
Need for conversion to laparotomy	0 (00.00)	0 (00.00)

The intra-operative blood loss in maximum number of cases (40.00%) in Group A, was in between 200-300 ml, whereas; in maximum number of cases (66.33%) in Group B, it was less than 50 ml. The mean blood loss was around 240 ml and 70 ml in Group A and B respectively (Table 3).

Table 3: Distribution of cases as per estimated intra-operative blood loss.

Intra-operative Blood loss (ml)	TAH (Group A) n=105 (%)	TLH (Group B) n=105 (%)
<50 ml	08 (07.60%)	70 (66.60%)
50-100 ml	07 (06.60%)	31 (29.50%)
100-200 ml	38 (36.10%)	04 (03.80%)
200-300 ml	42 (40.00%)	00 (00.00%)
300-400 ml	08 (07.60%)	00 (00.00%)
>400 ml	02 (01.90%)	00 (00.00%)
Mean ± SD	212.26±47.48	38.97±12.14

Value of $\chi^2 = 143.96$, $p=0.0001$, significant.

The need for postoperative analgesia was observed in 100% cases from Group A and 38.09% from group B. Maximum number of cases (57.10%) from Group A, needed post-operative analgesia for duration of 12-24

hours, whereas; maximum number of cases (57.10%) from Group B needed post-operative analgesia for duration up to 12 hours. The average number of doses of injectable analgesics, required for pain relief were 5 and 2 in Group A and B respectively (Table 4).

Table 4: Distribution of cases as per duration of post operative analgesic medication need.

Duration of analgesic medication (Hrs)	TAH (Group A) n=105 (%)	TLH (Group B) n=105 (%)
< 12 hrs	13 (12.30)	60 (57.10)
12-24 hrs	60 (57.10)	38 (36.10)
25-36 hrs	22 (20.90)	03 (02.80)
>36 hrs	10 (09.50)	00 (00.00)
Mean±SD	24.06 hrs. ±6.89hrs.	10.57hrs. ±2.14 hrs.

Value of $\chi^2 = 59.584$, $p=0.0001$, significant.

Maximum number of cases (78.00%) from Group A, needed post-operative intravenous fluid therapy for a duration of 24-48 hours, whereas; maximum number of cases (91.40%) from Group B, needed post-operative intravenous fluid therapy for a duration up to 24 hours. Maximum number of cases (80.90%) from Group A, could be ambulated out of bed within 19-24 hours, whereas; maximum number of cases (73.33%) from Group B, could be ambulated out of bed within 7-12 hours.

Table 5: Distribution of cases as per duration of hospital stay.

Duration of hospital stay (Days)	TAH (Group A) n=105 (%)	TLH (Group B) n=105 (%)
1-2	00 (00.00)	32 (30.40)
3-4	00 (00.00)	66 (62.80)
5-6	56 (53.30)	07 (06.60)
7-8	32 (30.40)	00 (00.00)
8-10	12 (11.40)	00(00.00)
>10	05 (04.70)	00(00.00)
Mean±SD	6.64 days ±2.04 days	2.14 days±0.97 days

Value of $\chi^2 = 185.11$, $p=0.0001$, significant.

The average duration required for out of bed ambulation was 25 hours and 14 hours in Group A and B respectively. Post-operative pyrexia was the commonest morbidity observed in both the groups. It was two times more in group A than Group B. Surgical site infections were seen in 3.80 and 1.90% cases from Group A and B respectively. Complications related to skin suture site was observed in 7 cases (7.55%) in group A and 2 cases (1.80%) in group B. Four cases (3.80%) in group A had SSI without dehiscence and 4 cases (3.80%) had SSI with dehiscence. One case (0.95%) in Group B had SSI without dehiscence and one case (0.95%) had SSI with

dehiscence. Maximum number of cases (53.30%) from group A had hospital stay of 5-6 days and maximum number of cases (62.82%) from group B had hospital stay of 3-4 days. The mean hospital stay in group A and B was 7.5 days and 3.5 days respectively (Table 5). Average duration for resumption of routine activity after discharge from hospital was 4 and 2 weeks in Group A and B respectively (Table 6).

Table 6: Distribution of cases as per post-operative resumption of routine activity.

Duration required for post-operative resumption of routine activity(weeks)	TAH (Group A) n=105 (%)	TLH (Group B) n=105 (%)
1 week	00 (00.00)	02 (01.90)
2 weeks	15 (14.20)	56 (53.30)
3 weeks	27 (25.70)	44 (41.90)
4 weeks	32 (30.40)	03 (02.80)
5 weeks	25 (23.80)	00 (00.00)
6weeks and more	06 (05.70)	00 (00.00)
Mean±SD	4.67weeks± 1.32weeks	2.64weeks± 0.97weeks

Value of $\chi^2 = 84.775$, $p=0.0001$, significant.

DISCUSSION

The present study was conducted to compare the outcome of both the techniques of hysterectomy in the same set up. One hundred and five cases each were randomly distributed in both the groups and outcome was compared.

Learning curve

In the present study, the junior faculty members who operated most of the cases in the study had average experience of 5-7 years of performing abdominal hysterectomy and 2-3 years of experience in performing laparoscopic hysterectomy. The surgical expertise in performing hysterectomy by laparoscopic technique improved over the period of time. The surgeons showed great improvisation in their individual skills with every case. They had adequate confidence after performing approximately ten to twelve cases independently.

Clinical outcome

Some comparative studies on clinical outcome between different hysterectomy techniques were reported and there have been eleven randomized controlled studies in which laparoscopic and abdominal or vaginal hysterectomy have been compared.¹¹⁻²¹ Munro and Deprest analyzed all reported studies from 1989 to 1994. A total of 2975 laparoscopic hysterectomies were recorded, with 314 reported in the context of a comparative study.²² Meikle et al reviewed published literature on laparoscopic hysterectomy from 1989 to September 1995. Cases identified included 3112

laparoscopic, 1618 abdominal and 690 vaginal hysterectomies. The studies were from eight countries, but more than half of them were from the United States.²³ Two other reviews were concentrated only on complications: 29 studies and 3189 procedures and 34 studies and 2412 procedures.^{24,25} In the present study, it was observed that the clinical outcome was much better in laparoscopic hysterectomy and also the complications were less as compared to abdominal hysterectomy.

Operating time

The mean operating time for abdominal and laparoscopic route was 1.78 hours and 1.93 hours respectively. Laparoscopic procedure took relatively longer time, but the difference was not significant. The shortest surgical time was 60 minutes and 65 minutes for abdominal hysterectomy and laparoscopic hysterectomy respectively. Similarly, the longest surgical time was 210 minutes and 240 minutes for abdominal hysterectomy and laparoscopic hysterectomy respectively. The operating times have ranged on average from two to four hours in personal reports by experts in laparoscopy.²⁶ The group with a 4-hour average operating time had 29 surgeons, but 13 performed the procedure only once and only four surgeons performed more than five operations.²⁷ The shortest reported operating times were those of a single surgeon or small groups of surgeons, who reported more than 100 laparoscopic hysterectomies (range 65-180 min).

Operative blood loss

Aniuliene et al performed a comparative analysis of hysterectomies. The amount of blood loss depended on the type of hysterectomy--less blood was lost during laparoscopic and more during abdominal hysterectomy (123.4 vs. 308.5 ml, respectively).²⁸ In the Belcohyst study, the hematocrit drop was 6.2% from the preoperative value and the blood transfusion rate was 5.4%.²⁹ In one observational retrospective study the hematocrit drop was 5.4% in abdominal, 5.5% in vaginal and 6% in laparoscopic hysterectomy, but there was no statistical difference in these parameters.³⁰ In the present study the mean blood loss was 220 ml and 38 ml for abdominal and laparoscopic hysterectomy respectively.

Complications /morbidity

In the present study, it was observed that the rate of major intra-operative complication was 1.90% and 95% in abdominal and laparoscopic hysterectomy respectively. There were two cases of bladder injury in abdominal hysterectomy group and one case of thermal injury to urinary bladder following use of electro-cautery in laparoscopy group. There was no case of ureteral injury or excessive haemorrhage in any of the groups. There was no urinary or bowel fistula following surgery. In the LASH group, the minor complication rate was 0.99% and the major complication rate 0.37%. The results from this series of 4505 women clearly showed that, in experienced hands, laparoscopic hysterectomy is not associated with

any increase in major complication rates. The minor complications observed in the present study were pyrexia, paralytic ileus, drug induced gastritis, thrombo-phlebitis, surgical site infections and urinary tract infections. The complications were more in abdominal hysterectomy group than laparoscopy group. The higher complication rates were reported by Debodinance.³¹⁻³⁵

Postoperative pain

In the present study the mean duration of requirement of analgesic medication was 24 hours and 11 hours for abdominal hysterectomy and laparoscopic hysterectomy respectively. In Meikle's review, postoperative analgesia was reported by six authors.²³ Analgesia requirements were measured either by the duration of use of any analgesic or the amount of both oral and injectable pain medication. In one prospective study, the least postoperative pain was experienced in laparoscopic and laparoscopic subtotal hysterectomy, followed by vaginal and abdominal hysterectomy.³⁶

Out of bed ambulation

In the present study, women could be ambulated out of bed much earlier following laparoscopic hysterectomy as compared to abdominal hysterectomy. The mean duration required for ambulation was 25 hours and 14 hours respectively. Ambulation was determined on the postoperative pain and the intravenous fluid therapy. The average duration of intravenous fluid therapy was 35 hours and 16 hours in abdominal and laparoscopic hysterectomy respectively. Delayed ambulation and pain also determined the duration of indwelling bladder catheter. The catheter was removed after 24 hours and 12 hours respectively following abdominal and laparoscopic hysterectomy respectively.

Hospital stay

In the present study, the mean duration of hospital stay was 6.64 days and 2.14 days in abdominal and laparoscopic hysterectomy respectively. As the women were nutritionally deficient and were staying far away from the hospital, they preferred to stay little longer in the hospital. Aniuliene et al performed a comparative analysis of hysterectomies. In their study, abdominal hysterectomy required on average a longer hospital stay compared with laparoscopic hysterectomies.²⁸ In the Belcohyst study the mean duration of hospital stay was 4.0 days, but a patient having an abdominal hysterectomy usually stayed in hospital for 7 to 9 postoperative days.²⁹

Convalescence time

In the present study, it was observed that the mean period of convalescence was 4.67 weeks and 2.29 weeks for abdominal and laparoscopic hysterectomy respectively. The information was either collected during follow up visit or by telephone, if patient had failed to report for follow up. Educated women and those who had

undergone laparoscopic hysterectomy opted to start their routine activities much earlier than their counterparts. Aarts et al reported similar observations.³⁷ In one comparative study the patients returned to work in two weeks after laparoscopic hysterectomy compared with five to six weeks after abdominal and vaginal hysterectomy.³⁸

CONCLUSION

Laparoscopic hysterectomy offers many advantages over abdominal hysterectomy, with minimal operative blood loss and pain and a short hospital stay and recovery time. The patient's symptoms as well as the Gynaecologist's skills influence the choice between these two methods, but Gynaecologist should have experience of all techniques of hysterectomy to offer the best treatment to patient.

Today, laparoscopic hysterectomy should be the preferred technique. Endoscopic surgeon should keep patience during learning phase and should operate independently, only after gaining sufficient experience under supervision of experienced endoscopic surgeon. The present comparative study confirmed the advantages of laparoscopic hysterectomy over conventional abdominal hysterectomy.

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