CASE SERIES

VAGINAL CUFF DEHISCENCE AFTER TOTAL LAPAROSCOPIC HYSTERECTOMY: PROSPECTIVE COMPARISON OF TWO TYPES OF SUTURING TECHNIQUES

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Background: To compare the frequency of vaginal cuff dehiscence after total laparoscopic hysterectomy between two different suturing techniques. Place and duration of study: The study was conducted at three centers; postgraduate tertiary care hospital, university affiliated hospital and private multidisciplinary hospital. The studied duration was from January 2019 to June 2020. **Method:** All patients with indication of total laparoscopic hysterectomy during the study period were included. These were randomly divided in to two groups A and B. Group A was performed upon the conventional interrupted figure of 8 vault suturing and group B with continuous, running, double layered suturing. Keeping the demographics almost same the frequency of a known but rare complication of vaginal cuff dehiscence (VCD) was determined. **Results:** A total of 195 patients were enrolled. Of these 87 were in group A and 108 in group B. The results were unequivocal as only one patient had the said complication. **Conclusion:** The morbid complication has no relation with the technique of vault suturing.

Keywords: Laparoscopic Hysterectomy; Vaginal cuff dehiscence; Vaginal vault

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INTRODUCTION

Hysterectomy is the most commonly performed major gynaecological surgery worldwide. Conventional open Total Abdominal Hysterectomy (TAH) has its place but minimally invasive surgical techniques, laparoscopy and robotics have gained popularity for this procedure since the last two and a half decades. Extensive literature is available over many aspects of Total Laparoscopic Hysterectomy (TLH) but only limited data is available over colpotomy methods, vault suturing techniques and their effects on vault dehiscence.[1]

The reported cumulative incidence among patients undergoing abdominal, vaginal or laparoscopic hysterectomy is 0.14%.[2] With the popularity of Minimal Invasive Surgery (MIS), it has been observed that the incidence of vaginal cuff dehiscence has risen, from about 0.79–4.93%.[2] For robotic hysterectomies the rate has also increased up to 4%.[3] This aspect has not been studied extensively especially before the minimally invasive surgery; one reason being its rare occurrence. Moreover, there is no consensus on the management of its sequelae.

The increased rate of this particular complication after the TLH and robotics has directed the thoughts to the probable causative steps. The colpotomy, its suturing technique, the type of suture material, the use of energy and its type have gained the attention of gynaecologists. These factors are hypothesized as the causative or the predisposing factors.[1,2,4]

There are different techniques of colpotomy and cuff closure. For the vault closure technique conventional figure of eight, continuous running single layer, continuous running double layer, interrupted, with or without single sutures or clips at the angles are being performed. Similarly, various types of suture materials have been and are being used. These include mono-braided, poly-braided and recently barbed sutures. However, there is no consensus about which suture material has superior efficacy with lower adverse outcomes.[1] Currently, there is no regional study available that compares the two surgical techniques used for total laparoscopic hysterectomy. As far as international studies are concerned much of work has been done in this regard; that is comparing different suture types and techniques. But specifically talking of the two techniques compared in our study none of the study has been found in literature. Thus, the objective of prospective study is to compare the primary outcome of frequency vaginal cuff dehiscence and secondary outcomes of blood loss and surgical time.

MATERIAL AND METHODS

The study was conducted at three centres; postgraduate tertiary care hospital, university affiliated hospital and private multidisciplinary hospital. All the patients for total laparoscopic

hysterectomy (TLH) with benign and premalignant indications were enrolled in the study between January 2019 and June 2020, using the research protocol approved by the hospital research committee. Total laparoscopic hysterectomy was performed by two experienced gynaecologists, to limit procedure bias. The technique used for TLH was the Rajesh Modi technique with few modifications.[5] This technique has been used in our endoscopy unit since 2013. We used a uterine manipulator instead of myoma screw and a ligasure instead of standard bipolar grasper. With uterine manipulator in place, the pedicles were coagulated and cut using ligature (Covidien / Medtronic). Peritoneum was reflected on both the anterior and posterior aspects. The uterine vascular pedicle was coagulated using standard bipolar grasper. Colpotomy was done by using an advanced bipolar grasper (Ligasure). For vaginal cuff suturing, the enrolled patients were into Group-1 or Group-2, based on the surgeon performing the procedures. Two types of suturing techniques were adopted. Group-1 was sutured by three sutures of figure of N type using vicryl (monofilament braided, Ethicon). Double-layer continuous running sutures using the same suture material were used in Group-2.

Interrupted figure of N, also known as figure of 8 sutures is now the conventional technique. Usually, three or sometimes two sutures at interval of less than one centimeter are taken depending upon the length of the vault. Double-layer continuous running sutures start at the right angle of the vault and continued towards the left with the assistant following the thread. This is turned back to the right again from the left corner and the second layer is completed until the right corner where the knot is tied. The predisposing factors taken as variables in the current study were the age, BMI, duration of the surgery, blood loss and the time taken for vault suturing.

The outcomes analyzed were the basic demographics including the patients' age and their BMI, frequency of vaginal cuff dehiscence in each group, time duration of the surgery and the amount of blood loss.

The ages and BMI of all patients were recorded, to have the two groups almost similar; that these might not be the confounding factors affecting the primary and secondary outcomes.

The frequencies of the primary outcome of vaginal cuff dehiscence were noted on the basis of symptoms and examination on two and four weeks follow up. The symptoms asked for were bleeding or discharge per vaginum. On examination the vault was visualized by speculum and integrity checked. The time of surgery was noted in both groups to determine if there is any significant time difference due to change in technique. Similarly, blood loss was recorded with the aim of determining the change in technique if, has affected the volume of blood loss. The secondary outcomes if affected might in turn have affected the primary outcome.

RESULTS

One hundred and ninety-five (195) participants were enrolled in the study; 87 (44.6%) were sutured using interrupted technique and 108 (55.4%) were sutured using continuous technique. The most common age group in this study was between 41–50 years (57.9%). Majority of participants in this study were obese (44.1%) (Table-1)

Vaginal cuff dehiscence occurred in only one patient. She presented with heavy bleeding per vaginum. She was managed conservatively by antibiotics and vaginal packing. Blood loss was less than 10 mL in 116 (59.5%), at the maximum of 150–200 ml. 50.8% procedures were completed within 61–120 minutes, only 6% required more than 180 minutes. Only one patient had vault dehiscence (Table-2). The blood loss was not significant in both groups. Duration of surgery and frequency of vault dehiscence was comparable between two groups (Table-3).

Table-1: Age of patient and BMI

Characteristics	N (%)
Age of Patient (in years)	
20–30	1 (0.5%)
31–40	22 (11.3%)
41–50	113 (57.9%)
51–60	58 (29.7%)
> 60 years	1 (0.5%)
BMI (kg/m^2)	
<18.5	6 (3.1%)
18.5–24.9	38 (19.5%)
25–29.9	65 (33.3%)
>30	86 (44.1%)
Uterine Weight (in grams)	
<100	23 (11.6%)
101–300	130 (66.7%)
30–500	36 (18.4%)
>500	5 (3.0%)

Table-2: Blood loss and duration of surgery in minutes

Variable	N (%)
Blood Loss (in mL)	
Less than 10	116 (59.5%)
10–50	54 (27.7%)
51–100	17 (8.7%)
101–150	2 (1.0%)
150–200	6 (3.1%)
Duration of Surgery in Minutes	
<60	24 (12.3%)
61–120	99 (50.8%)
121–180	58 (29.7%)
181–240	12 (6.2%)
>240	2 (1.0%)
Vault Dehiscence	
No	194 (99.5%)
Partial	1 (0.5%)

Table-3: *p*-value of variables

Variables	Running	Interrupted	*p*-values
Blood Loss (in mL)			
Less than 10	79 (73.1%)	37 (42.5%)	0.005
10–50	18 (16.6%)	36 (41.3%)	
51–100	8 (7.4%)	9 (10.3%)	
101–150	1 (0.9%)	1 (1.1%)	
150–200	2 (1.8%)	4 (4.5%)	
Duration of surgery (in minutes)			
<60	17 (15.7%)	7 (8.0%)	Not Significant
61–120	52 (48.1%)	47 (54.0 %)	
121–180	31 (28.7%)	27 (31.0%)	
181–240	7 (6.4%)	5 (5.7%)	
> 240	2 (1.8%)	1 (1.1%)	
Vault Dehiscence			
Yes	1 (0.9%)	0	Not Significant
No	107 (99.1%)	87 (100%)	

DISCUSSION

Advanced laparoscopic procedures in the field of gynaecology have proved their superiority over open methods over the years.[6] Having known the overwhelming advantages of minimally invasive surgery, there is a significant increase in the incidence of vaginal cuff dehiscence in total laparoscopic hysterectomy. Vaginal cuff dehiscence was a rare event otherwise; that is why this is the focus of the work in our current study. Identification of predisposing factors for the morbidity is a challenging task keeping in view the scarcity of relevant comparative studies and the studies with weak concrete conclusions

Our study had almost equal numbers of patients in both the groups with almost similar demographics. The BMI ranged from 18 to more than 30. Since other factors including blood loss and the time taken for the whole procedure remained insignificant, the result of suturing technique became more credible. Internationally, the aetiology of the said complication is still unclear. We opted for two methods; one conventional interrupted figure of 8 or N and another continuous running double-layered.

There are some studies conducted comparing the influence of various vaginal vault closure techniques on the incidence of VCD after TLH. The only prospective study with comparison of two different methods of suturing is by Jeung *et al*. Our results are comparable to this original comparison; both showed unequivocal results. The Jeung results, between figure of 8 and knotted double-layer running sutures were 1.6 and 0.8 %, respectively.[7] Almost contradictory results were seen when Uccella *et al*. conducted such study. There was a threefold increased incidence in the laparoscopic single-layer interrupted suturing group which was compared to transvaginal closure with interrupted sutures. The results were 0.18 and 0.64 %, respectively.[8] This one had a different suturing technique and approach; thus, detecting a conclusion with its comparison is not well justified. M D Blikkendaal *et al* conducted a comparative retrospective study with three types of suturing techniques.[9] The methods were transvaginal interrupted, laparoscopic interrupted and laparoscopic single layer running. 3.3% of VCDs occurred in laparoscopic interrupted, 2.4% in laparoscopic running and 1.3% in vaginal interrupted type. The techniques matched our ones except the vaginal group and the results were almost the same as ours; the result being not significant. Siedhoff M T *et al*. study had a different suture material and thus cannot be used to determine the conclusion. It compared two sutures and two different techniques one of which was barbed bidirectional running suture and found no VCDs in the barbed suture group versus a VCD rate of 3.1% for other methods of closure.[10] Similarly, Einarsson *et al*. described a non-comparative cohort in which the vaginal cuff was closed with a barbed suture, 0.6% of the patients requiring vaginal cuff re-suturing.[11]

Despite the studies over different techniques and different suture materials, the incidence of VCD is still there as compared to open and vaginal approaches. This leads us to the need of considering other factors such as amount and type of coagulation.

The strengths are that to the best of our knowledge, this is the first study from Pakistan that compares the frequency of vaginal cuff dehiscence in total laparoscopic hysterectomy with two different suturing techniques. Secondly this is a multicentric study and surgery performed by similar technique except for the vault. Also, the variables in both groups were almost similar.

The limitation of the study was its smaller sample size. Secondly it cannot be compared with the local data due to scarcity of the local studies.

CONCLUSION

The vaginal cuff dehiscence is rare but significant morbidity associated with TLH. The change in the technique of vault suturing did not affect the result in this prospective study.

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