

VAGINAL VAULT CLOSURE TECHNIQUES IN TOTAL LAPAROSCOPIC HYSTERECTOMY: A COMPARISON BETWEEN LAPAROSCOPIC ROUTE VAULT SUTURING AND VAGINAL ROUTE SUTURING

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ABSTRACT

Objective: To study and compare the two approaches for vaginal vault closure in patients undergoing total laparoscopic hysterectomy.

Material and methods: A comparative study was undertaken in 70 patients who underwent total laparoscopic hysterectomy for benign gynaecological disorders in Kesar SAL medical college, Ahmedabad. In half of the patients, vault closure was done through laparoscopic route and in the other half it was done through vaginal route.

Results: The group who underwent vaginal vault suturing by laparoscopic route, the mean operative time was 77.0 (± 6.4 SD, range 70-94) minutes as compared to the group in which vaginal vault were sutured through vaginal route (88.5 minutes with a SD ± 4.9 , range 80 - 100), the observed difference was statically significant (p <0.00). The post operative vaginal length was better preserved in laparoscopic suturing (8.4 cm with a SD of ± 0.4 , range 8.5 - 10) as compared to vaginal suturing (7.34 cm with a SD of ± 0.4 , range 7.5 - 9.2) and difference was statically significant (p <0.00). Post operative complications were also statically significantly lower in the laparoscopic route vault closure(28.5%) as compared to vaginal route vault closure(88.5%) and difference was statically significant (Z= 6.42, p < 0.000).

Conclusion: laparoscopic route vault closure was less time consuming and comparatively safer than vaginal route vault closure.

Key words: Total Laparoscopic Hysterectomy, Vaginal Vault closure

INTRODUCTION

As more and more laparoscopic surgeons have already crossed their learning curve, laparoscopic suturing is no longer a tedious and time consuming prospective. Therefore vaginal vault closures by laparoscopic and vaginal routes are comparable to each other in terms of advantages and disadvantages.

Total laparoscopic hysterectomy has been classified by American Associations of Gynecological Laproscopists. This method describes laparoscopic hysterectomy using anatomical landmarks involved during

operation. It has five stages stratification but it does not mention the method of closure of vaginal vault making it difficult to quantify the difference between the various methods of vault closure. The newer classification by Ioannis Koutoukos suggests four types of laparoscopic hysterectomy using five descriptions.¹⁻⁵

This classification not only inculcates the different anatomical levels and but also defines the vaginal vault closure methods. The method of vaginal closure is a very important step in classification.

Table 1: Hysterectomy classification by Ioannis Koutoukos

Classification	Type	Descriptions
Laparoscopic assisted vaginal hysterectomy	I	Laparoscopic dissection of infundibulopelvic ligament
Laparoscopic hysterectomy	II	Trans-section of uterine artery
Laparoscopic hysterectomy	III	Trans-section of uterosacral and cardinal ligaments
Laparoscopic hysterectomy	IV	Laparoscopic culdotomy with vaginal suturing
Total laparoscopic hysterectomy	IV	Laparoscopic culdotomy and suturing

Objectives of our study are to evaluate the outcomes in regarding to operative time, post operative complications and post operative vaginal length in two different methods i.e. vaginal and laparoscopic route for vault closure in total laparoscopic hysterectomy.

MATERIALS AND METHODS

Analysis of 70 cases undergoing total laparoscopic hysterectomy was done during the period of December 2009 to April 2011 in the Department of Gynecology of Kesar Sal Medical College, Ahmedabad. Patients were selected with the common criteria of benign gynecological disorders for hysterectomy. The indications varied from dysfunctional uterine bleeding, fibroid, adenomyosis, endometriosis, endometrial hyperplasia, benign ovarian cyst and chronic pelvic inflammatory diseases (PID). The age groups were 35 to 55 years. The same operative/anesthetic team was involved in all the cases.

The standard surgical technique is followed. All the patients were given standard laparoscopic (modified Lloyd) lithotomy position with aseptic painting and draping. After dilating the cervix to Hegar no. 10, uterine length was measured; colpometizer was adjusted and placed inside the uterus. The colpometizer is specially designed. It comprises of steel rod with a surrounding cup made of polyvinyl chloride. Instruments included graspers, bipolar forceps, scissors, a needle holder, and a unipolar hook electrode. A 10-mm supra-umbilical port and three secondary 5-mm ports are introduced. With help of bipolar forceps and scissors first cauterization and desiccation of the tubo-ovarian pedicle is done; the round ligament is desiccated after cauterization and parametrium is opened anteriorly and posteriorly. To highlight the anterior fornix, the cup of the colpometizer is pushed up firmly. At the level of the fornix, the uterovesical peritoneum is incised and bladder dissected down to expose 1 to 2 cm

of the anterior vagina. Next desiccation of uterine vessels is done after proper cauterization posteriorly dissection is done up to the level of insertion of uterosacrals; the same is done on the opposite side. The cup is pushed cephalad for proper exposure and also so that the ureters will fall away. Bladder dissection is completed by pushing vesical fascia down with the help of scissors. With unipolar hook electrode anterior fornix is incised after assuring that the cup is well placed just beneath, extended posteriorly till entire circumference is cut open. Uterus is pulled into vagina if it uterus can remain there to maintain pneumo-peritoneum during suturing. Alternatively, the uterus is removed and a glove with an abdominal mop inside is placed into the vagina to maintain pneumoperitoneum. If the uterus is too large to remove through the vagina, would be morselled transvaginal with care.

Vaginal vault closure: Laparoscopic suturing vicryl no.1, 30 cm in length is taken introduced inside through the left side port with the help of needle holders, box type stitch is taken starting from the right side through vaginal angle incorporating the right uterosacral, then anteriorly through vaginal mucosa then again through vaginal mucosa of left side and posteriorly through the left uterosacral. The stitch is then tightened centrally so that the uterosacrals are pulled medially. Suction irrigation is done. Vaginal suturing is done by continuous suture with vicryl no.1; hemostasis is achieved. Post operatively routine antibiotic coverage and analgesia was given to all patients. Those who did not respond to routine analgesia, semisynthetic opioids (tramadol) were administered.

Results were analyzed manually by appropriate statistical test like t test, standard error of proportion etc.

OBSERVATIONS

A total of 70 patients were taken up for the surgery. The two groups were divided on the basis of type of approach selected for surgery.

Mean age was 41.5 [\pm 4.1 standard deviation (SD)] years in patients operated through vaginal route and in the laparoscopic route was 41.9 (\pm 5.4 SD) years. Mean operative time was 88.5 minutes (\pm 4.9 SD, range 80-100) taken through the vaginal route and 77.0 minutes (\pm 6.4 SD, range 70-94) through the laparoscopic route. Laparoscopic route required about 11 minutes less time for the surgery compared to vaginal route and it was statically significant ($Z=8.45$, $p=0.00$).

Table 2: Post operative complications in total laparoscopic hysterectomy

Complications	Vault Closure Route	
	Vaginal (n=35) (%)	Laparoscopic (n=35) (%)
Primary hemorrhage	03(08.5)	00
Pain	12(34.2)	04(11.4)
Spotting	10(28.5)	04(11.4)
Vault infection	04(11.4)	02(05.7)
Vault prolapse	01(02.8)	00
Vault dehiscence	01(02.8)	00
Total	31(88.5)	10(28.5)

Above table showing that only 28.5% patients had various post operative complications among laparoscopic route vault closure as compared to 88.5% in vaginal route vault closure. This difference was statically highly significant ($Z=6.42$, $p < 0.000$). Overall post operative complications were occurred in 58.6% of patients.

The mean postoperative vaginal length was 8.34 cm (\pm 0.4 SD, range 7.5-9.2) and 9.4 cm (\pm 0.4 SD, range 8.5-10) through vaginal and laparoscopic route respectively. The observed difference was statically highly significant ($Z=11.15$, $p < 0.00$).

DISCUSSION

In the present study, the mean time for laparoscopic suturing and vaginal suturing was 77.0 and 88.5 minutes respectively. Laparoscopic route required about 11 minutes less time for the surgery compared to vaginal route and it was statically significant ($Z=8.45$, $p < 0.00$). These findings were comparable with the study by

Jong Ha Hwang et al.⁶ The difference can be due to time required to change the position of surgeon, changing the set of instrument, time required for creation of pneumoperitoneum, the second time for suction and irrigation. The average operating time for total laparoscopic hysterectomy varies from 76 to 192 minutes.⁶⁻⁸

In laparoscopic suturing the mean post operative vaginal length was 9.3 cm as compared to 8.3 cm in vaginal approach. The observed difference was statically highly significant ($Z=11.15$, $p < 0.00$). This can be due to the fact that in laparoscopic suturing margins were not everted and the ligature was passed just 1 cm below the cut margin. In laparoscopic approach during vault closure, the uterosacral ligaments are properly visualized and incorporated in the ligature thus causing effective vault suspension as compared to vaginal method where such demarcation is not always possible.⁷ In both the approaches posterior vagina is not transected, hence pelvic innervations are unaffected. Thus chances of vault prolapse are less.

In present study, Overall post operative complications rate was 58.6% as compared to 34.8% in study by Jong Ha Hwang et al.⁶ However, only 28.5% patients had various post operative complications among laparoscopic route vault closure as compared to 88.5% in vaginal route vault closure. This difference was statically highly significant ($Z=6.42$, $p < 0.000$). In contrast, Jong Ha Hwang et al.⁶ had found no significant difference in post operative complications in laparoscopic route versus vaginal route vault closure.

Twelve patients undergoing vaginal suturing who had significant pain on routine analgesia were treated with tramadol (semisynthetic opioids), whereas in laparoscopic method only four patients needed higher analgesia. This can be attributed to the fact, that in vaginal method more pulling of uterosacrals and vaginal tissues are involved.

In laparoscopic approach sutures are inverted and not exposed to vaginal flora thus less chances of post operative vault infection, similarly vault dehiscence is also less.⁸

CONCLUSION

In total laparoscopic hysterectomy vaginal vault closure by laparoscopic route requires

statistically significant less time for completion as compared to vaginal route. The post operative complications like vault infection and pain was also found to be significantly lower in the laparoscopic route as compared to vaginal route suturing for vault closure. In laparoscopic vault suturing, the mean post operative vaginal length was significantly more than vaginal route suturing of vault approach.

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