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A COMPARATIVE STUDY OF LAPAROSCOPIC MYOMECTOMY WITH UTERINE ARTERY LIGATION AT ORIGIN VERSUS LAPAROSCOPIC MYOMECTOMY WITH INTRA-MYOMETRIAL VASOPRESSIN INJECTION.

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ABSTRACT **Background:** For Uterine fibroids, despite the higher level of technical competence needed to perform the treatment, laparoscopic ligation of the uterine vessels might be a better option than hysterectomy**.** The present study is aimed to compare two procedures laparoscopic myomectomy with uterine artery ligation at origin versus laparoscopic myomectomy with intra-myometrial vasopressin injection in patients with uterine fibroid. **Methodology:** A Retrospective comparative study was conducted on 160 women of age between 22-45 years diagnosed as uterine fibroid from January 2020 to December 2022 (3 years). Patient divided into 2 groups: **Group A: -** 60 women who underwent Lap. myomectomy with LUAL, **Group 2:**100 women who underwent Lap. myomectomy with intra myometrial Vasopressin Injection. They underwent Trans Vaginal Sonography and Fibroid mapping for localization of position of fibroid. **Results:** The average blood loss was significantly less and average operating time in Group A. Group A patients required almost 15mins more time for surgery. In addition, Group A only 3.3% required blood transfusions during or after the surgery. The symptom recovered much better in Group A compared. The recurrence rate of myomas in the Group B, who had laparoscopic myomectomy with intra-myometrial Vasopressin Injection, was higher than that in the LLUAL Group (Group A) ($P<0.05$). Furthermore, in the infertile patients 36.7% in the Group A and 31.3% in Group B had pregnancies and 27.5% in the Group A and 33.1% in Group B had a live birth but difference was not statistically significant. **Conclusion:** Uterine artery ligation requires 15 min. more time. Less bleeding during temporary uterine artery ligation at origin allows more time of excision of myoma and clear field of vision for tracing path of ureter, so there are less chances of injury to ureter.

KEYWORDS : Uterine Fibroid, Laparoscopic Myomectomy, Uterine Artery Ligation, Intra-Myometrial Vasopressin Injection

INTRODUCTION:

The most prevalent gynecologic tumors in the United States are uterine myomas, which affect 20% to 50% of fertile women[1]. Women with symptomatic leiomyomas inside transmural or sub-serosal components have traditionally been treated with hysterectomy and myomectomy, whereas symptomatic submucosal myomas are typically treated with hysteroscopic resection[2]. In recent years, less invasive options such as laparoscopic and hysteroscopic myomectomy techniques have also been developed[3]. Unfortunately, compared to the alternative method, abdominal myomectomies have a much greater reported incidence of recurrence myomas[4]. This is because, in cases where many myomas are present, the surgeon may inadvertently remove the larger, more apparent ones while leaving the smaller or in situ ones in place[5,6]. Postoperative intact myomas could be one reason for the increased frequency of myoma recurrence within the uterus and the continued occurrence of menorrhagia. Disagreements also exist regarding every kind of surgical operation. Several researchers have seen significant bleeding, longer hospital stays, postoperative complications, and longer operating times after myomectomies, whether laparoscopic or abdominal, particularly when multiple myomas are involved[5].

Liu (2000) developed a novel method known as laparoscopic bilateral coagulation of uterine vessels to get around these issues[7]. Other investigations have demonstrated that uterine artery ligation is a successful treatment for symptomatic myomas, with tumor sizes reduced by 40% to 50% and patient symptoms reduced by 60% to 80%. Although cell apoptosis and necrosis have been proposed as plausible explanations, the precise processes by which the myoma's size is reduced by uterine artery ligation remain unclear. Despite the higher level of technical competence needed to perform the treatment, given these demonstrated benefits, laparoscopic ligation of the uterine vessels-which poses less obstacles than other surgeries-might be a better option than hysterectomy[8]. (R1)

The present study is aimed to compare the operative time, blood loss, recurrence, loss of pregnancy and increase in pregnancy rate between two procedures laparoscopic myomectomy with uterine artery ligation at origin versus laparoscopic myomectomy with intra-myometrial vasopressin injection in patients with uterine fibroid.

METHODOLOGY:

A Retrospective comparative study was conducted at Insipria Hospital and Training center of Obstetrics & Gynaecology, Rahata, Shirdi. 160 women of age between 22-45 years who presented to our hospital from January 2020 to December 2022 (3 years) with menorrhagia and lower abdomen pain and diagnosed as uterine fibroid, were enrolled for study. Pregnant women or post-menopausal women were excluded from the study. All selected patients with uterine fibroid underwent Lap. Myomectomy, and followed up for outcomes. Out of 160 enrolled patients, Laparoscopic Uterine Artery Ligation (LUAL) was done in 60 patients and intra myometrial Vasopressin Injection was given in 100 patients.

So, patient divided into 2 groups: **Group A: -** 60 women who underwent Lap. myomectomy with LUAL, **Group 2:**100 women who underwent Lap. myomectomy with intra myometrial Vasopressin Injection. They underwent Trans Vaginal Sonography and Fibroid mapping for localization of position of fibroid. Both the groups were explained about risk, benefits and fertility chances and possible risk of rupture after fertility were explained and written and informed consent was taken.

Operative Procedure Followed:

Lap Myomectomy was performed under general anesthesia. Supra umbilical incision was made and direct trocar entry done and pneumoperitoneum is created and laparoscope was inserted through this port. Two 5mm operating ports inserted. In first group of 60 women retroperitoneum was opened through posterior lateral approach. Just parallel to IP ligament and posterior to round ligament by using harmonic cutter. The uterine artery is identified and separated from ureter and ligated with silk. i.e. shoelace knot is taken. The peritoneum window is closed with Vicryl No. 1.

Then vertical incision was taken for anterior uterine wall myoma's and transverse incision was taken for posterior wall myoma's, the myoma was localized by feeling the counter of uterus and myoma was enucleated with two forceps using tractions and counter traction. Myometrium was repaired in two layers with barbed suture Vicryl No. 1 with baseball suturing, saline wash is given. Myoma was removed by morcellation. 15 mm port entry of morcellation was closed with port closure needle. In second group, same procedure is done, but first Inj. Vasopressin 20 units in 200ml saline injected in the capsule of myoma and around the myoma. Myoma is excised using same procedure.

The data are presented as mean and standard deviation. Para-metric independent samples t-test was used to compare differences between

the two groups, and categorical variables were analyzed by chi-square test. P<0.05 was considered statistically significant.

RESULTS:

Out of total 160 women, 60 were in Group A and 100 in Group B. There were no statistically significant differences in the mean age of the patients, average size and number of myomas between both groups. Infertility was the main presenting feature 23% patients in the Group A group and 27% in Group B. Both groups have similar general characteristics including Age, Size of Myoma and the No. of Myomas. (Table 1)

Table 1: Clinico-demographic Of Patients:

Group	Group A (n=60)	Group B (n=100)	P value
Age (years)	31.3±5.4 (19–43)	30.67±5.9 (19–42)	0.781
Women with infertility	23%	27%	0.557
Number of myomas	2.11±1.1 (1–7)	1.89±0.9 (1–5)	0.848
Size of myomas (cm)	4.97±1.2 (3.2–7.8)	5.50±1.9 (3.8–8.7)	0.332

The average blood loss was significantly less in Group A than Group B (P values <0.001). The average operating time was significantly more in Group A than in Group B (both P values <0.001). Group A patients required almost 15mins more time for surgery than Group B. In addition, Group A only 3.3% required blood transfusions during or after the surgery; in contrast, none of the patients in Group B needed blood transfusions in 15.7% patients (P<0.001). So, in the Group A, we not only achieved an effective hemostasis during myomectomy but also prevented the eventual blood transfusion side effects. (Table 2)

Table 2: Intra-operative And Post-operative Results:

Group	Group A (n=60)	Group B (n=100)	P value
Operation time (min)	116.3±17.5 (97–140)	101.8±11.5 (91–126)	0.0001
Blood loss (mL)	166.3±88.6 (47–460)	388.3±127.4 (180–780)	0.0001
Febrile morbidity	19.8%	22.2%	0.596
Postop. stay (days)	1.9±0.8 (1–3)	3.2±1.1 (1–5)	0.157
Need for blood transfusion (%)	3.3%	15.7%	<0.001

Febrile morbidity occurred in 19.5% patients in the Group A and 22.2% patients in Group B, but the difference was not statistically significant (P=0.596). The average length of the postoperative hospital stay was also comparative in both the groups (P=0.157). There were no major complications during any of the surgeries.

Table 3: Clinical Outcomes And Long-term Follow-up Results:

Group	Group A (n=60)	Group B (n=100)	P value
Symptom resolution (%)	89.2%	77.6%	0.004
Recurrence rate (%)	9.7%	18.4%	0.023
Pregnancy rate (%)	36.7%	31.3%	0.785
Live birth (%)	27.5%	33.1%	0.521

Table 3 shows that the symptom recovered much better in Group A compared to Group B (P<0.05). The recurrence rate of myomas in the Group B, who had laparoscopic myomectomy with intra-myometrial Vasopressin Injection, was higher than that in the LLUAL Group (Group A) (P<0.05). Furthermore, in the infertile patients 36.7% in the Group A and 31.3% in Group B had pregnancies and 27.5% in the Group A and 33.1% in Group B had a live birth but difference was not statistically significant.

DISCUSSION:

In this study, we looked at how two methods affected the length of the operation, blood loss, recurrence, pregnancy loss, and rise in pregnancy rate in women with uterine fibroids. Comparing laparoscopic myomectomy with intra-myometrial vasopressin injection vs laparoscopic myomectomy with uterine artery ligation at the origin was the technique that was performed. Liu et al. have previously described the idea of uterine vascular ligation[9]. The largest study to date, conducted by Liu et al[5], included 46 cases of laparoscopic myomectomy alone and 56 cases of laparoscopic uterine depletion surgery including myomectomy.

Numerous techniques have been found to date to lessen intraoperative bleeding during myomectomy. A unique clamp[10], along with sponge forceps with rubber feet[11], were used to compress the uterine and ovarian arteries. Further studies showed that using a catheter to encircle the lower uterine segment could restrict the uterine vessels[12]. A novel technique known as laparoscopic bipolar coagulation of uterine vas (LBCUV) was introduced by Liu (2000)[7]. That technique prevented both the uterine arteries themselves and the anastomosis zone of the ovarian and uterine arteries. Thus, before a myomectomy, ligating the uterine arteries became a helpful homeostatic technique.

Our method included tying the uterine arteries before the myomectomy was performed laparoscopically. Compared to laparoscopic myomectomy with intra-myometrial Vasopressin Injection (388.3±127.4 mL; P<0.001), the blood loss from LUAL and myomectomy with this treatment was statistically considerably less. A blood loss of 166.3±88.6 mL was the mean. Uterine artery ligation, which is comparable to the bipolar coagulation of the uterine artery as reported by Liu et al[7,13], is responsible for the decrease in blood loss. Patients in Group B needed blood transfusions at a rate of 15.7%, while just 3.3% of Group A patients did. In another trial, blood transfusions were necessary for 13.3% of patients in the myomectomy only group but not for any of the patients in the uterine artery blockade plus myomectomy group[4]. As a result, research has demonstrated that uterine artery occlusion provides an effective hemostasis method prior to laparoscopic myomectomy.

The peritoneal window was closed and the uterine arteries were ligated using the ovarian fossa technique after the ureter was dissected. For surgeons with less expertise, the learning curve for laparoscopic uterine artery ligation may be steeper. Group B and Study Group A had 19.8% and 22.2% of their patients with postoperative fever, respectively, although this difference was not statistically significant. This rate was consistent with what another study[4] found. It's possible that hematomas in the myometrium or residual blood clots in the abdomen were the primary cause of postoperative fever.

Multiple myomas have been identified as the primary underlying reason of treatment failure[8]. Little, hidden myomas are frequently left in the submucosal region after the removal of larger, easily noticeable myomas[5,8]. Therefore, the menorrhagia that lingered following surgery and the inefficiency of treatment could have been caused by little concealed myomas that are still present in the uterus. Treatment for mildly symptomatic myomas that may later grow larger in the uterus involves blocking the uterine artery. Certain uterine myomas that are symptomatic can be removed by it[4]. Every sizable, discernible myoma in the study was removed via laparoscopic myomectomy. Uterine artery ligation (LUAL) was another treatment option for little myomas. The recurrence rate for the experimental group was 6.2%, a significant decrease from the reported rate of 9.7% for Group A. In other investigations, the uterine-depletion group had a success rate of 94.2% to 100.0%, while the myomectomy group had a success rate of 67.3% to 84.0%[4,5].

It seems that uterine artery blocking is a dependable procedure. After an average of thirty months, none of the 157 women who underwent uterine artery embolization had symptomatic myomas[14]. The myoma-related issues appear to be fully resolved by the surgery. The occlusion of the uterine arteries is probably causing necrosis and an ischemic change in small myomas that will increase later[15].

According to a study, 14.6% of women who had bilateral uterine vascular blockage became pregnant; however, only 5.6% of these pregnancies ended in a live birth[16]. Theoretically, laparoscopic bipolar coagulation of the uterine vasculature or uterine artery embolization could lead to uterine vascular depletion and endometrial insufficiency[15]. It was discovered that 19.2% to 59.2% of the non-infertile patients who had myomectomy and uterine artery ligation were pregnant[4,5]. The percentage of infertile individuals who got pregnant following a laparoscopic myomectomy varied from 53.6% to 64.3% over an extended period of follow-up[17]. The pregnancy rates in Groups B and A were 31.3% and 36.7%, respectively; nevertheless, there was no discernible difference between the two groups. We may be the only ones that ligated the uterine arteries before the myomectomy, which could account for the lack of a statistically significant difference in the pregnancy rate between the two groups. Further research is also needed on the myomectomy and LUAL-related concerns that affect conceiving and pregnancy.

Of our patients who were infertile, 27.5% of the infertile women in Group A and 33.1% of the infertile women in Group B gave birth to a live child. According to other research, 37.5% of patients who had uterine depletion plus myomectomy and almost 50% of patients who had a myomectomy alone gave birth to live children; however, these patients were not infertile and merely desired to conceive[5]. After a lengthier follow-up period, the live birth rate for infertile patients who underwent laparoscopic myomectomy ranged from 35.7% to 50%[18].

CONCLUSIONS:

Uterine artery ligation requires 15 min. more time. Less bleeding during temporary uterine artery ligation at origin allows more time of excision of myoma and clear field of vision for tracing path of ureter, so there are less chances of injury to ureter. Injecting large amount of vasopressin before myomectomy is detrimental can lead to pulmonary oedema and post of fever. Fertility after uterine artery ligation at origin is not affected because utero ovarian or ovarian vessels are not compromised.

Uterine artery ligation at origin helps to shrink small fibroids and prevents the recurrence of fibroid. Uterine artery ligation requires adequate training and skill of surgeon. More studies with a larger number of infertile patients are needed to address the possible effect of this procedure on fertility outcomes.

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