

## Review of Laparoscopic Myomectomy Versus Open Myomectomy

Dr . Zigmee Dorjee Tamang<sup>1</sup>, Dr Tseten Zangmu Bhutia<sup>2</sup>, Dr RK Mishra<sup>3</sup>,  
Dr JS Chowhan<sup>4</sup>,

1. Department of Obstetrics & Gynecology, Sikkim Manipal Institute of Medical Sciences. Gangtok.

3. Professor, World Laparoscopy Hospital. Gurugram, NCR Delhi.

4. Professor, World Laparoscopy Hospital. Gurugram, NCR Delhi.

### Abstract

**Introduction:** Uterine fibroid are the commonest benign tumor found in women of reproductive age group. Mostly asymptomatic but some times it causes symptoms like abnormal menstrual bleeding, pelvic pain, pressure symptoms, subfertility. Treatment available for fibroid are medical therapy, UAE, MRI guided focused ultrasonography thermal therapy, myomectomy, hysterectomy. Myomectomy is the preferred option for women who wish to retain their reproductive function, although hysterectomy is the most definitive treatment for symptomatic fibroid, when there is no valid reason for myomectomy.

**Study Design:** Retrospective analytical review, where searches were conducted in Pubmed, Medline, Springer, Cochrane Library to identify relevant literature.

**Aim and objective:** The purpose of this study is to determine the better surgical method for myomectomy by comparing laparoscopic and open myomectomy with regards to surgical outcomes such as intraoperative blood loss, duration of surgery, hospital stay and intra and peri-operative complications.

**Conclusion:** Compared to open myomectomy, laparoscopic myomectomy has added advantages such as early recovery, less post-operative pain, less duration of hospital stay, reduced intra-operative blood loss, less adhesion formation. Recurrence and pregnancy rates after myomectomy are similar after both the surgeries. Despite laparoscopic myomectomy having many advantages open myomectomy is still a frequently performed procedure. Due to advantages of laparoscopic surgery, efforts have to be made to implement this procedure into daily practices by training more surgeons in this field so as to provide best care to the patients.

**Keywords:** Myoma, laparoscopic myomectomy, open myomectomy, lapconversion)

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### I. Introduction

Fibroid (leiomyomas or myomas) are benign tumor that arises from the smooth muscles cells in the uterus. They constitute the most common benign tumors among women of reproductive age group. <sup>(1)</sup> The incidence ranges from 20-80% and are often detected incidentally in routine examination, mostly asymptomatic. <sup>(2)</sup>

Symptoms related to myomas are menstrual disturbances (heavy menstrual bleed, dysmenorrhea, intermenstrual bleeding), pressure symptoms (disturbed bowel and bladder habits), pelvic pain, subfertility, pregnancy associated complications (early pregnancy loss, preterm labor, malpresentation). <sup>(3)</sup>

The treatment option available for myoma are medical therapy (oral contraceptive pills, GnRH agonist, aromatase inhibitor Serum progesterone receptor modulators), myolysis, uterine artery embolization, MRI guided focused ultrasound thermal therapy, myomectomy and hysterectomy. <sup>(4)</sup> Myomectomy is the preferred option for women who wish to retain their reproductive function, although hysterectomy is the most definitive treatment for symptomatic fibroid, when there is no valid reason for myomectomy. <sup>(5)</sup>

Myomectomy is a uterine-preserving surgery done in women with symptomatic fibroids and wishing to preserve fertility. Done either by open technique or minimally access techniques (hysteroscopy and laparoscopy). Laparoscopic myomectomy (LM) has been established in recent years and is less invasive method with minimal complications. <sup>(6)</sup> Myomectomy performed by laparoscopy is associated with decrease blood loss and faster recovery than abdominal myomectomy (AM). <sup>(7)</sup> However, laparoscopic myomectomy requires advanced laparoscopic skills and ability to suture effectively and efficiently. <sup>(8)</sup>

Laparoscopic myomectomy is the removal of fibroid with a small keyhole incision in the abdominal wall, through which instruments are passed. It is usually assisted with morcellation. <sup>(9)</sup> Laparoscopic myomectomy differs from open myomectomy in which a large incision is given over anterior abdominal wall and fibroid is excised. Evidence suggested that laparoscopy myomectomy is associated with reduced morbidity compared to open surgery. <sup>(7)</sup>

The purpose of this study is to determine the better surgical method for myomectomy by comparing laparoscopic and open myomectomy with regards to surgical outcome such as intraoperative blood loss, duration of surgery, hospital stay and intra and peri-operative complications.

## **II. Aims and objective:**

To determine the better method of surgery for myomectomy by comparing laparoscopy and open myomectomy with regards to surgical outcome such as intraoperative blood loss, duration of surgery, hospital stay and intraoperative and post operative complications.

## **III. Materials and methods:**

Rapid review of literature was carried out and medical literature was searched to identify reviews and studies relevant to laparoscopy and open myomectomy.

Searches were conducted by following data bases: Google, Pubmed, Medline and Online Springer facility available at World Laparoscopy Hospital, Gurugram, NCR, Delhi.

## **IV. Comparative Studies and Results:**

Jin C et al <sup>(7)</sup> in their study meta analysis of randomized control trial comparing laparoscopic versus open myomectomy (OM) with regards to operative parameters and outcome where six RCTs were included found out fall in hemoglobin level and blood loss was significantly less in LM group than OM group. Pain intensity (VAS score) was significantly lower in LM group than OM group. Patient recovery was more faster in LM group than OM group. LM was associated with fewer complications than OM group. However, there was no significant difference in rate of major complications and recurrence. The operative time was significantly longer in LM group than OM group.

D' Silva EC et al <sup>(10)</sup> conducted a retrospective study to investigate the morbidity of laparoscopic versus open myomectomy (OM). In their study they found that number and size of the fibroid as one of the contributing factor for a successful laparoscopic surgery. In their study fibroid upto 10 cm diameter was removed laparoscopically, while fibroid more than 10 cm diameter was managed through laparotomy or had to undergo lapconversion (17%). Lapconversion was higher when number of fibroid was more than 5 (75%). Intraoperative blood loss was significantly less in laparoscopy than open myomectomy. Duration of hospital stay was significantly less (2+1days) in laparoscopy group than open group (3+1days). Post-operative complications (fall in Hb%) were less in laparoscopy group than open group. However, duration of surgery was more in cases of those undergoing laparoscopic myomectomy (mean: 170+28 mins) than open myomectomy (mean: 135+70mins). Their study concluded with "LM having several advantages over OM such as faster recovery and minimal risk and LM to be the intended surgery".

Marret H et al <sup>(11)</sup> carried out a retrospective multicentric study comparing myomectomy by laparoscopy versus open technique and found out women who underwent open myomectomy usually had large and more number of myomas as compared with those who underwent laparoscopic myomectomy. Post-operative complications (decrease in hemoglobin, fever), length of hospital stay was less in women who underwent laparoscopic myomectomy compared to open. Lapconversion rate in their study was about 29% and was high for inexperienced surgeons. Recurrence rate at 2 years was (2.5%) for LM versus (3.6%) for AM.

Tasdemir N et al <sup>(12)</sup> conducted a study comprising of 42 patients undergoing myomectomy and comparing laparoscopy versus open myomectomy and found out that operation duration was longer in those patient who underwent LM than those who underwent OM. Pre and post-operative fall in hemoglobin and complications showed no significant difference in their study. The duration of hospital stay were less in LM group compared to OM group.

Kalogiannidis I et al <sup>(13)</sup> carried out a prospective study comparing laparoscopy myomectomy versus open myomectomy and found that estimated blood loss was significantly less in patient who underwent laparoscopic myomectomy compared to open myomectomy. They had a shorter duration of hospital stay compared with those who underwent open myomectomy. Intraoperative and postoperative complications did not showed much difference between the two groups. They even found operative time shorter in those undergoing laparoscopic myomectomy than those undergoing open myomectomy (62+21 vs. 83+24 min). Their study concluded "laparoscopic myomectomy as minimally invasive approach and alternative to conventional laparotomic myomectomy, offering significant advantages".

Li MH et al <sup>(14)</sup> conducted a retrospective study to compare operative characteristics, postoperative residue, recurrence and pregnancy outcome between laparoscopy and abdominal myomectomy (AM). They found that longer operative time (89+32 versus 74+35mins), increased blood loss, more decrease in hemoglobin level (22+14 versus 15+12 g/l) and longer duration of hospital stay (6.4+1.6 versus 4.4 +1.3) were observed in abdominal myomectomy than laparoscopic myomectomy. However, they found residue rate more in those who under went LM (2.6%) than AM (1.4%). There was not much difference in pregnancy outcome in both the

groups. They concluded both the surgical approach effective with residual rate higher in LM than AM and recurrence of myoma mostly dependent on the number of myomas removed.

Wen KC et al <sup>(15)</sup> in their study comparing outcome of women undergoing laparoscopic myomectomy and ultraminilaparotomy (UMLT) (skin incision less than 4 cm) found that mean operative time was significantly longer in LM group than UMLT group. Intraoperative blood loss was higher in LM than in UMLT. Post-operative fever was more common in patients who had undergone UMLT than LM. However recurrence rates, need for repeat surgery, pregnancy outcome showed not much difference over ten years follow up. They concluded that due to more operative time and more blood loss LM needs more skills, experience and equipments.

Dubussion JB et al <sup>(16)</sup> carried out a study for predicting the risk of conversion of laparoscopic myomectomy to an open procedure. Their study included 426 women out of which 378 had successful LM while 48 patients had a conversion to open procedure. They found four pre-operative factors that were independently related to risk of conversion, (size >5cm, intramural type, anterior location and pre-operative use of GnRH agonist). They concluded that this prediction provides a useful tool that enables to criteria helpful for selecting patients for LM.

Alessandri F et al <sup>(17)</sup> carried a randomized study to compare the postoperative recover of patient undergoing laparoscopy and mini laparotomy. They found that operative time was significantly lower in laparotomy group than laparoscopy group. However, postoperative decline in level of hemoglobin was less in those who underwent laparoscopic myomectomy. Laparoscopic group also had reduced length of postoperative ileus, shorter duration of hospital stay, less pain postoperatively, less requirement of postoperative analgesia and early recovery than those who underwent laparotomy. They concluded that laparoscopic myomectomy offered more benefits to the patients than mini laparotomy.

Bhave Chittawar P et al <sup>(18)</sup> in their study “to determine the benefits and harm of laparoscopic or hysteroscopic myomectomy over open myomectomy” found that laparoscopic myomectomy was associated with less post-operative pain measured on VAS than in those who underwent open myomectomy. Low risk of post-operative fever was noted among laparoscopic myomectomy group compared with open myomectomy. They concluded “laparoscopic myomectomy as procedure associated with less reported post-operative pain, lower post-operative fever, shorter hospital stay compared with open myomectomy”. They didn't find much evidence suggesting the difference in recurrence risk between the two groups.

Malzoni M et al <sup>(19)</sup> conducted a retrospective nonrandomized study “to compare the feasibility, safety, morbidity and pregnancy outcome of laparoscopy and mini laparotomy in treatment of uterine fibroid”. Their study found the mean operative time less in laparotomy group than in laparoscopy group. The mean length of hospital stay was longer in those who underwent laparotomy than in laparoscopic myomectomy. Laparoscopic myomectomy was associated with less intraoperative blood loss. The pregnancy rate after myomectomy showed not much difference in both the groups.

Herrmann A et al <sup>(20)</sup> in their study found laparoscopic myomectomy having several advantages over abdominal myomectomy. These advantages include lower decline in hemoglobin concentration, lower post-operative pain, lower analgesic requirement, shorter duration of hospital stay, fast post-operative recovery, decrease risk of adhesion formation. Fertility outcome and pregnancy rate were found to be higher in laparoscopic groups They further stated that laparoscopy should be the standard approach for myomectomy.

## **V. Discussions:**

Myomectomy is the often performed surgery done in woman with symptomatic fibroids willing to preserve their uterus and desires fertility. It is done either by open abdominal (conventional laparotomy, mini laparotomy) or by minimal invasive (laparoscopy, hysteroscopy, robotic) route. With advancement in technology and increasing skills among the surgeons, more numbers of laparoscopic myomectomy are performed now days for management of symptomatic fibroid. Laparoscopic myomectomy offers added advantages than open myomectomy such as decreased intraoperative blood loss, shorter duration of hospital stay, less post-operative pain, early recovery and reduced post-operative adhesion risk compared to open abdominal myomectomy. <sup>(7, 10, 11, 12, 20)</sup> Less or reduced post-operative pain in laparoscopy might be due to minimal dissection and minimal disturbance of normal tissues in laparoscopic surgery as compared to open surgeries where it is quite extensive. More intraoperative blood loss was noted in laparotomy group than the laparoscopy group, but the size of myoma was also bigger in open group than the laparoscopy group. So giving a closer look to these studies, we can say blood loss may be related to the size of myoma, experience of the surgeon and the haemostatic measures applied during surgery. The reduced blood loss in laparoscopy may be due to use of effective electrocoagulation and coagulating instruments like ligasure and harmonic. In two of the articles reviewed in this study D' Silva EC et al <sup>(10)</sup> and Dubussion JB et al <sup>(16)</sup> found that the success of laparoscopic myomectomy depends on numbers and size of myoma present. When the number of myoma were more than 5 and size of myoma (>10 cm and >5 cm respectively in two studies) showed increased incidence of

lapconversion. Inexperienced surgical hands were reported as cause of lapconversion in one of the study.<sup>(11)</sup> Pre-operative evaluation of number, size and location of myoma are therefore necessary for careful selection of patients and to prevent lap-conversion. Increase in operative time during laparoscopic myomectomy was reported in few of the studies reviewed.<sup>(7, 10,12, 15)</sup> However, Kalogiannidis I et al<sup>(13)</sup> and Li MH et al<sup>(14)</sup> in their study reported less operative time for laparoscopic myomectomy compared to open myomectomy. The speed of surgery basically depends upon the skill and experience of the surgeon and the way surgeon executes their task. In three of the studies reviewed reported no significantly difference in recurrence rate.<sup>(7,15,18)</sup> Two studies reviewed in this study showed not much difference in pregnancy outcome in both the groups.<sup>(15,18)</sup> However, Herrmann et al<sup>(20)</sup> reported pregnancy rate better after laparoscopic myomectomy.

## VI. Conclusion:

This review shows that laparoscopic myomectomy has some added advantages over open laparotomic myomectomy, like there were reports evidence of less post-operative pain, shorter duration of hospital stay, early recovery and fewer complications than open myomectomy. However, longer duration of operative time was reported in few evidences but it mainly depends upon the surgeon skills and experience. Laparoscopic surgery being relatively new, different surgeons are bound to report different operative time depending upon their surgical skills. In developing countries like India, where patients many times present late to hospital when the myomas have grown bigger, (due to ignorance, lack of awareness, financial problems) open myomectomy will still continue to be a common and more performed surgery compared to laparoscopic myomectomy as laparoscopic procedures are still expensive and expertise surgeons lesser in numbers. So more surgeons needs to be trained in laparoscopy technology by providing and organizing training at affordable cost so that a women can benefit from this treatment modality.

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