MYOMECTOMY LAPAROSCOPIC VERSUS LAPAROTOMY

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ABSTRACT

Leiomyoma is one of the most common benign condition affecting women. 50% women at 50 years of age are found to have fibroid sonographically when being evaluated for unrelated reasons and majority are asymptomatic[27]**.** Spectrum of symptoms depends on number, size and location of fibroid.Pressure symptoms like abdominal pressure, urinary frequency, constipation;Menstrual symptoms like menorrhagia and Infertility due to fibroid [more so with submucous]causing pregnancy loss, premature delivery may cause the women seek treatment[6].Recently there is an increasing trend for laparoscopic treatment of fibroid-subserous and intramural types, instead of laparotomy. Main attractions are faster postoperative recovery and less postoperative adhesions.Main concerns are subsequent fertility,reproductive outcome and future recurrence.Hysteroscopic access is required for submucous fibroid.The purpose of this review is to analyse various studies comparing laparoscopy versus laparotomy for myoma surgery. Laparoscopy is the preferred method in properly selected patient and surgeon's skill in endosuturing is a major deciding factor.Review of comparative studies will clarify the status further.

Keywords

Laparoscopic Myomectomy, myomectomy, open myomectomy, laparoscopic fibroid surgery, Fibroid.

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INTRODUCTION

Fibroid affects 25% females of reproductive age. They arise from benign proliferation of a single smooth muscle cell .Increased estrogen stimulation along with growth hormone or Human Placental Lactogen appears to be major growth regulators[2]. Progesterone inhibits the growth[6].Based on location the various types of myoma are-subserous; intramural and sub mucous fibroid. Although temporary medical treatment can be given for symptomatic relief,definitive treatment is surgery-hysterectomy or myomectomy depending upon patients desire to retain the uterus. Although newer modalities like Uterine Artery embolisation exist, myomectomy remains the surgical option for women desiring uterine conservation or in particular future fertility[12].

Aim:

The aim of this review is to compare the effectiveness and safety of laparoscopic and conventional laparotomy in treatment of leiomyoma. The following parameters were evaluated for both laparoscopic and open procedures.

1.Preoperative evaluation for patient selection
2.Operative technique
3.Operating time.
4.Intra-operative and postoperative complications.
5.Late Postoperative considerations
6.Cost effectiveness
7.Quality of life analyses

Materials and Methods:

A literature search was performed using Medline and the search engine Google and HighWire Press. The following search terms were used: “myomectomy,laparoscopy versus laparotomy,open fibroid surgery,laparoscopic myomectomy”. Selected papers were screened for further references. Criteria for selection of literature were methods of analysis [statistical or non statistical], operative procedure and the institution where the study was done [Specialized institution for laparoscopic surgery].Number of cases were not considered as a criteria since laparoscopic myomectomy is a controversial subject and no definite criteria for patient selection is yet defined.

1.Preoperative evaluation and method of patient selection

Symptomatic women who want to retain uterus for future reproductive function or personal reasons are advocated myomectomy.These include- Menometrorrhagia and anemia; Pelvic pain and pressure;Enlarging myoma;Associated fetal wastage and infertility; Fibroid size more than 12 weeks and inability to evaluate adnexa;Obstructed ureter[6].

Age is not a criteria to select the route of myomectomy. According to Berger et al Morbidity with

laparoscopic myomectomy is low and age has no impact. Hence laparoscopic myomectomy can be offered to selected female of all age group[15]. Various techniques for myomectomy include Laparotomy; laparoscopic myomectomy and laparoscopy assisted myomectomy [LAM]. Patient who desires future fertility is the most challenging to the surgeon who attempts laparoscopic

approach. The risk of uterine rupture is major concern due to difficulty of adequately closing all layers laparoscopically[6].

According to a review by N.Hameed and Asghar Ali Contraindications for laparoscopic myomectomy include any medical illness contraindicating laparoscopy due to inability to tolerate pneumoperitoneum or trendelenburgh position,or Diffuse myoma,More than 3 myoma of more than or equal to 5 cms,Uterine size more than 16 weeks, Myoma size more than 15 cms[7].With increase in size and number of myoma ,the risk of laparoconversion,and laparoscopic complications increase,hence open myomectomy indicated.
According to Dubuisson and Chaperon 1996 Laparoscopy can be used for medium sized myoma of 5 cms and better avoid for more than 8 cms and if more than 3 in number .With large myoma cleavage is more difficult, hence operative time, perioperative hemorrhage, and conversion to laparotomy is more. Conversion rate increases with size of myoma, anterior location, number of myoma or accompanying adenomyosis [3].

However there is no universally accepted criteria regarding number and size of myoma to contraindicate laparoscopic yomectomy.The decision solely depends upon surgeons confidence for laparoscopic techniques and endosuturing skills.

ACOG recommendations for treatment of myoma is given below.

Summary of ACOG Practice Bulletin no.16, May 2000 for Management of Leiomyomas

Evidence level A-recommendations based on good and consistent scientific evidence.
Hysterectomy is the definitive cure for symptomatic leiomyoma.Abdominal myomectomy is a safe and effective option in women who wish to retain uterus. If this option is selected women should be counseled preoperatively about relative risk of re-operation.
Use of GnRH agonists preoperatively is beneficial to improve the hematological status and shrinkage of fibroid. Benefits should be weighed against cost and side effects for individual patients.
Use of vasopressin at the time of myomectomy appears to limit blood loss.

Evidence level B- recommendations based on limited or inconsistent scientific evidence.

The clinical diagnosis of rapidly growing myoma has not been shown to predict uterine sarcoma and thus should not be used as the sole indication for myomectomy or hysterectomy.

Evidence level C- recommendations based on consensus or expert opinion. Laparoscopic myomectomy is a safe and effective option for women with small number of moderately sized uterine fibroids who do not desire future fertility. Further studies are necessary to evaluate safety of this procedure for women planning pregnancy. Hysteroscopic myomectomy is an effective option for controlling menorrhagia in women with submucous fibroid. Although endometrial ablation is an effective option for controlling menorrhagia in women without fibroid, further studies are needed in those with clinically significant fibroid.

Because leiomyoma may be a factor in infertility for some patient, the issues are complex, and myomectomy should not be performed without a comprehensive infertility evaluation. Although postmenopausal patient with leiomyoma may have more bleeding problems and some increase in leiomyoma size while taking Hormone replacement therapy there appears to be no reason to withhold this treatment option from women who need this therapy[1].

Preoperative evaluation would include Hematocrit to assess anemia;Preoperative GnRha treatment –to restore hematocrit; decrease myoma size; decrease need for transfusion and intraoperative blood loss. According to James Carter a 40% reduction in volume of myoma occurs which also reduces the time required for removal[28]Hypoestrogenic side effects and loss of cleavage planes during surgery due to hydropic degeneration of myoma are problems [7].U ltrasonogram to provide information regarding size, site and number of fibroid is a must.Fluid contrast sonography would help to detect cavity distortion by submucous fibroid especially in infertility cases.Intravenous urography is suggested to rule out ureter obstruction in case of large broad ligament fibroid [7].

Marret et al suggest Preoperative evaluation with ultrasound is essential to get number, size, type and location of myoma to choose the most appropriate surgical procedure[18].This is also important to reduce conversion to laparotomy during laparoscopic myomectomy[19].

WH Parker compared laparoscopic myomectomy and abdominal myomectomy and concluded that Well selected patients can have laparoscopic myomectomy but very large myomas are not suitable although they are amenable to uterine conserving surgery by laparotomy that is facilitated by many preoperative and intraoperative measures to minimize and replace operative blood loss[14].

2.Operative technique

Procedure specific details for laparoscopy

Laparoscopic myomectomy was first time described at the end of 1970,s for sub serous fibroid(Semm and Mettler,1980). In 1990,s the technique was developed to include intramural fibroid (dubuisson et al1991;hasson et al 1992).However laparoscopic myomectomy is a subject of considerable debate especially for intramural fibroid due to technical difficulty, increased blood loss, high risk of conversion to laparotomy and quality of uterine scar [3]..

Various steps of laparoscopic myomectomy include-1. Preventive hemostasis.2. Stabilising myoma and incision over myoma.3. Enucleation4. Suturing the myoma bed.5. Retrieval of myoma [2].

Pedunculated or sub serous fibroid:

Pedunculated myoma can be easily removed by coagulating and cutting the stalk. Dilute vasopressin may be injected at base of stalk.According to James Carter injection of dilute vasopressin[5 units in 100 ml of normal saline into stalk of the peduncle or bed of the subserous myoma will reduce the blood supply and therefore reduce blood loss during surgery.this also helps in delineating the plane of dissection.for a procedure exceeding 30 minutes of dissection this can be repeated.Care must be taken to avoid intravascular injection and anaesthesiologist notified prior to injection[28].

Intramural fibroid:

This would need more manipulation for removal. So dilute vasopressin should be injected to multiple sites between myometrium and fibroid capsule. Incision is made over serosa overlying fibroid with monopolar electrode and is extended until it reaches the capsule. Two grasping forceps are used to hold the edges of myometrium and the suction irrigator is used as blunt probe to remove serosal covering of the leiomyoma from its capsule. The Myoma screw is inserted into the fibroid as it helps to apply traction while the suction irrigation instrument can be used as a blunt dissector. Vessels are elecrocoagulated and then cut. After complete Myoma removal the uterine defect is irrigated, bleeding points are controlled with the open jaw of bipolar. If the fibroid is small and patient is not keen on future fertility,the edges of the uterine defects are approximated by coagulating the myometrium without suturing and tube ligation is performed. If the defect is deep situated, the edges of defect should be approximated by using 4-0 PDS. The repair involve serosal and subserosal layer or can be done in one layer. Sutures are applied at a distance of 5mm. After repair thorough suction and irrigation should be performed to prevent adhesion formation in future. Some gynaecologist use adhesive medical glues over the suture line to prevent adhesion. Tumble square knot is better to use if the edges are in tension. Dundee jamming knot with continuous suturing may be used if there is not much tension followed by Aberdeen termination. Precise suturing of multiple layers is almost impossible laparoscopically. Broad ligament fibroid are difficult to remove due to risk of injury to ureter and uterine artery at the time of dissection. Following a thorough exposure of ureter and vessels and depending on the location of Myoma, an incision is made on the anterior or posterior leaf of the broad ligament and the leiomyoma is slowly shelled same as other subserosal or intramural fibroid.
Throughout the procedure the location of the ureter is monitored, bleeding points are controlled by bipolar. The broad ligament and peritoneum are not closed in cases of broad ligament Myoma. If post operative bleeding is suspected, a drain should be left[2].

Removal of myoma.

Fibroid removal is one of the difficult and time consuming procedures. Larger Myoma may be removed using any of the four different techniques-1.extraction through posterior colpotomy incision with or without morcellator.2.intra-abdominal morcellation with simultaneous extraction through abdominal port site with a mechanical morcellator.3. intra-abdominal morcellation with scissors,harmonic scalpel or knife with extraction through port site.4.minilaparotomy incision with morcellation and extraction[28]. In women with concurrent posterior cul-de-sac pathology posterior colpotomy is not safe.. The process is ineffective for calcified myomas.
For infected tissue and in case of suspected carcinoma tissue retrieval bag should be used. Many sizes of disposable tissue retrieval bags are available and hard rim of these retrieval bags are easy to negotiate inside the abdominal cavity[2].
For large size myoma, colpotomy route is good for retrieval. Colpotomy can be done laparoscopically with the help of heal of hook. Counter pushing by other instruments is effective. Sponge over sponge holding forceps is inserted in posterior vaginal fornix by one assistant and surgeon cuts the vaginal fascia between both the uterosacral ligaments with the heel of hook. Use of morcellator is another way which facilitates grinding of solid tissue and then these can be taken out without any difficulty. Recently many companies have launched battery operated morcellator which is an important instrument for tissue retrieval in myomectomy[2].

Procedure specific details for laparotomy

Methods to reduce blood loss include/Bonney's myomectomy clamp; rubins tourniquet, hypotensive anaesthesia, vasopressin. The former two cannot be used in laparoscopy. Technique-attempt to remove all fibroid through single midline incision avoiding vascular structures laterally. A linear uterine incision as small as possible, is made on the most prominent part of the leiomyoma. When possible incisions are made on anterior uterine wall and maximum number of myoma removed through minimum number of incisions to minimize potential adhesion formation. Myoma situated on posterior uterine wall are removed through fundal Bonney's hood incision to prevent adhesion between uterus and bowel. Capsule identified and myoma enucleated following the cleavage plane. The defect is repaired with multilayered approach-deep sutures to close the dead space, a second imbricating layer and serosa with baseball sutures, approximation is better than in laparoscopy. Pelvis is washed with saline solution and adhesion barrier left in peritoneal cavity[10].

Newer modifications of laparoscopic myomectomy

A- Laparoscopy assisted myomectomy
Combines laparoscopy with 2-4 cms abdominal incision done for myoma more than 8 cms or in deep myoma requiring extensive morcellation and uterine repair in layers. The advantage is reduced operating time and reduced need for extensive laparoscopic experience[7].

B- Laparoscopy assisted transvaginal myomectomy
Done for extensive and deeply infiltrating fundal and posterior wall fibroid. Laparoscopy is done to confirm the size, location and number of myoma. Intra myometrial vasopressin is injected. Posterior colpotomy is done to deliver the myoma and uterus. After myoma removal, uterine reconstruction is performed by conventional suturing transvaginally. Uterus is replaced back into its anatomical position and colpotomy repaired. Final laparoscopic survey done and peritoneal lavage given[7].

C- Robot assisted laparoscopic myomectomy with the Da Vinci surgical system
Use of robot assisted technology(Advincula et al) may overcome the challenges encountered with uterine incision, enucleation, repair and extraction that are seen with conventional laparoscopic myomectomy. This may provide surgeons with improved dexterity and precision coupled with advanced imaging and allow endoscopic approach to be more accurately modeled after open surgical technique[12].

D- Laparoscopic myoma coagulation [myolysis] and cryosurgery
Blood supply of the fibroid is coagulated using ND-YAG Laser or with long bipolar needle electrode. Long term effects are unknown. Advantage is regrowth of myoma doesn't occur. However risk of uterine rupture in future pregnancy has been reported. In cryomyolysis, myoma is frozen with liquid nitrogen delivered with a special probe. The efficacy of this technique need to be determined by further trials[7]

3.Operating time.

Stringer et al 1997 compared 49 laparoscopic myomectomy with 49 open surgery for myomectomy. laparoscopy took more time with 258 versus 133 minutes for laparotomy. Duration depends upon size, number, depth and surgeons experience. Hence preoperative USG and hysteroscopic evaluation is a must to decide upon the route. Surgeon must also consider his own experience for deciding and begin with medium sized posterior sub serous fibroid[23].

Bulletti et al conducted a randomized comparison between laparoscopic myomectomy and abdominal surgery from 1993 to 1998 .with total of 131 patients-65 laparotomy and 66 laparoscopy.All had at least one large fibroid of >5 cms.no significant difference was found between the two regarding number ,size and location of large myoma.the operative time was slightly but not significantly lower in open surgery .Three laparoconversions (4.3%) due to difficult hemostasis and suturing occurred[10].
However studies show, the range of operative time for laparoscopic myomectomy is varied and unpredictable.Hence fixed theatre session for laparoscopic myomectomy is not possible.

4.Intraoperative and postoperative complications

Laparoscopic route has two advantages in reducing hemorrhage compared to laparotomy-the pressure of pneumoperitoneum prevents bleeding from intramyometrial capillaries and veins and magnification provided by laparoscopic lens helps to recognize the cleavage planes more precisely and hence selective coagulation of small vessels can be done[8].

However the Bonney's clamp and rubins tourniquet used in laparotomy cannot be used in laparoscopy.

Experienced laparoscopic surgeon with suturing skills is a must to overcome the difficulty in approximation of myoma bed. Inadequate suturing predisposes to rupture in future pregnancy. Increased operative time and lack of predictability of operating time for laparoscopy make fixed theatre session impossible for laparoascopic myomectomy.
Laparoscopic closure of uterine incision is inferior to that of laparotomy due to difficulty in re approximating the incision by laparoscopic suturing. Accumulation of intramural hematoma could be detrimental to healing and extensive use of electrosurgical dissection may lead to poor vascularisation and tissue necrosis with further negative effect on scar strength[4].

Stringer et al 1997 in nonrandomized study found statistically significant decrease in estimated blood loss, decreased need for transfusion in laparoscopy group. However size and number of myoma operated were not considered [23].

According to A.Taylor,M.Sharma et al, vascular occlusion of the uterine blood supply using triple tourniquet occluding the uterine and ovarian arteries to reduce intraoperative bleeding at laparoscopic myomectomy is feasible and appears safe.This was done using a no.1 polyglactin suture around cervix to occlude uterine artery and another suture tied around ovarian vessels[30].

Martin Voss et al described a new technique using yasargil aneurism clips to reduce blood loss during laparoscopic myomectomy by clipping the uterine arteries temporarily. No significant change in uterine artery flow prior to and after surgery was found.however the study consisted only 13 patients and further trials are thus needed to confirm efficacy[31].

Complications of laparoscopic myomectomy
These are the same as for open surgery or laparoscopy in general-.anaesthesia accidents, respiratory compromise, thromboembolic phenomena, urinary retention, active bleeding, hematoma, infection and injury to vessels, ureter, bladder and bowel. Complications unique to laparoscopy include-large vessel injury and subcutaneous emphysema.
Incisional hernia after laparoscopy is increased if 10mm or larger trocar is placed at extraumbilical site. These sites should be closed[5]..

Uteroperitoneal fistula may occur because meticulous approximation of all layers laparoscopically is impossible[6].

L.Mettler et al conducted a retrospective analysis of 178 patients who underwent laparoscopic myomectomy at university hospitals,campus keil,Germany in year 2000 to 2003.the mean operating time was 90 minutes and mean hospital stay was 2+_0.5 days.only 2 patients had a small hematoma in the abdominal wall.no late complications were found.7 cases required second laparoscopic myomectomy.pregnancy rate of more than 55% achieved in infertility cases.postoperative recovery and resumption to normal life was quicker than compared to laparotomy .he concluded laparoscopic myomectomy to be the technique of choice for pedunculated-subserosal and intramural fibroids in properly selected patient.A skilled endoscopic surgical unit is a must.submucous and diffuse myoma were not evaluated[29].

Ferrero et al conducted a randomized study of laparoscopy versus minilaparotomy for myoma surgery among 148 women.comparative parameters of statistical significance included decreased operative time with minilaparotomy group[$p<0.001$].laparoscopy was associated with lower decline of hemoglobin concentration[$p<0.001$],a reduced length of postoperative ileus and shorter hospital stay[$p<0.001$]. Also pain intensity at 6 hrs after surgery was significantly lower and need for analgesics in first 48 hrs was significantly lower in laparoscopy group.Complete recovery by the end of 2 weeks was seen in laparoscopy group while the open group took longer.Complication rate was higher in laparoscopy group with one case of laparoconversion due to difficulty in hemostasis and one acute diffuse peritonitis by ileal perforation.laparoscopy is costly compared to open surgery.He concluded that laparoscopy offers the benefits of lower postoperative analgesic use and faster postoperative recovery[16].
A double blind study conducted by Holtzer et al 2006,a prospective randomized trial concluded that laparoscopic surgery reduces postoperative pain and analgesic requirement in myomectomy during first 3 days of surgery compared to open procedure[8].
laparoscopic myomectomy has the advantages over laparotomy of shorter hospitalization;Faster recovery;Decreased postoperative pain, ileus and thromboembolic phenomena[7].

5 .Postoperative care and Late Postoperative considerations

Patient experiences fatigue and discomfort for 1-2 weeks after laparoscopic surgery however routine activities and gentle exercises are allowed by 1 week[5].For open surgery it takes longer 3-4 weeks for full recovery. Vaginal incision is examined 6-12 weeks after surgery for healing. Any granulation tissue is coagulated with silver nitrate. Sexual intercourse is refrained for 3 weeks[5].
Risk of Postoperative adhesions decreases when laparoscopy is done[Dubuisson et al]. It has the advantage of respecting the principles of microsurgery-atraumatic manipulation, fine instruments ,thorough washing. Also it avoids intraperitoneal contamination and maintains the internal milieu during procedure[3].
The critical risk factors for adhesion formation include posterior location of myoma and the number of uterine incisions.High CO2 pneumoperitoneum insufflation pressure and inadequate humidification at at high flow rate is a cofactor in adhesion formation. None of the several antiadhesive measures used like intercede,preclude,goretex,have been found to be unequivocally effective.Several investigators have recommended 2nd and even 3rd look laparoscopy to diagnose and treat adhesions postoperatively[7].
Obstetric quality of laparoscopic myomectomy scar is a matter of considerable debate.
Buletti et al 1998 conducted randomized comparison of fertility and obstetric outcome after laparoscopic myomectomyof large myoma with laparotomy between 1993 and 1998.patients

were randomly selected for treatment by laparotomy(n=65) or laparoscopy(n=66).the 2 groups were homogenous for number ,size and position of myoma .Statistically significant differences found were febrile morbidity and a pronounced hemoglobin drop in the laparotomy group with p<0.001.Postoperative hospital stay was lower in laparoscopy group.There were no significant differences in pregnancy rate(55.9%after laparotomy,53.6% after laparoscopy),abortion rate(12.1 versus 20%,preterm delivery rate(7.4 versus 5%) and caesarian section(77.8 versus 65%).No case of uterine rupture during pregnancy or labour was observed[10].
It is difficult to draw any conclusion regarding quality of laparoscopic myomectomy scar because- firstly the frequency of uterine rupture are not known, as cases are reported in isolation,without any indication of number of pregnancy occurring after surgery;secondly reporting bias due to novelty of laparoscopic myomectomy technique[3].
Nezhat et al ,1998 studied the *recurrence rate* after laparoscopic myomectomy by retrospective review of 114 patients. The cumulative rate at 5 years was 51%.This was definitely higher than observed inseries of myomectomy by laparotomy[candiani et al 1991;Acien and Quereda,1996].also the time lapse before recurrence was shorter in laparoscopic myoma removal.This is due to the difficulty to palpate the myometrium thoroughly during laparoscopy which means small intramural myoma which do not deform the uterine serosa will be overlooked,resulting in incomplete removal more often than in laparotomy[3,22].

6. Cost effectiveness.
Presently the cost of laparoscopic surgery is higher due to the need for specialized instruments,theatre set up ,need for more theatre staff and maintenance.Due to reduced morbidity in postoperative period and faster recovery,the expenditure can be considered cost effective.

7.Quality of life analysis
Berger et al by doing a retrospective analysis of 351 patients who underwent laparoscopic myomectomy concluded that morbidity was low for laparoscopic surgery.also as a sign of contentment,87% of patients would select the same procedure again[15].

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DISCUSSION
Many authors agree with the choice of laparoscopic approach,whenever possible,considering the advantages over traditional laparotomy .The operative and postoperative complications are few and occur rarely in laparoscopic surgery.The mean hemoglobin drop is lower after laparoscopy compared to laparotomy.improved hemostasis is possible with greater visual clarity in laparoscopy.Conversion to laparotomy when the surgeon becomes uncomfortable with laparoscopic approach should not be considered as a complication; rather it is a prudent surgical decision that decreases the patient risk profoundly. Transient episodes of febrile morbidity is more frequent after laparotomy confirming laparoscopy to be a less invasive technique(Bulletti et al)[10].

Increased operative time is one disadvantage of laparoscopy,particularly endosuturing needs more time.The time needed for laparoscopic myomectomy is more difficult to schedule depending upon myoma location ,suture and morcellation.

Concerning fertility restoration and reproductive outcome following myomectomy no significant difference is found between laparoscopy and open surgery group(Dubuisson et al 1996,Nezhat et

al 1999,Darai et al 1997).Quality of uterine scar after laparoscopy is difficult to assess due to rarity of rupture uterus.

Another point of debate is recurrence of fibroid.Because of selection criteria for open surgery includes larger myoma,the recurrence rate was found higher in laparotomy group(6.7%) and 1.8% in laparoscopy group(Bulletti et al 1998).Firm conclusion cannot be drawn because of lower number of cases reported.
Considering the recurrence rate and consequent likelihood of repeated surgery,patient should be offered the least invasive surgical approach available(Rossetti et al)[9].long term results of laparoscopic myomectomy ,recurrence rate in comparison to abdominal surgery –a prospective randomised study conducted by Rossetti et al 1991 in which 81 patients were selected and randomized;40 underwent abdominal myomectomy and 41 laparoscopic myomectomy.follow up period was 40 months.the two groups were similar in age ,parity ,and symptoms.There were 23% recurrence in abdominal group and 27% recurrence in laparoscopy group.The difference was not statistically significant.Most recurrences were seen within 2 years after surgery[9].

Patients are generally satisfied with their choice of laparoscopic myomectomy even if uterine conservation is temporary and they may need hysterectomy on a later date for recurrence.

RESULTS
All reviews favour laparoscopic myomectomy as treatment for myoma compared to laparotomy,due to decreased morbidity in intraoperative and postoperative period and improved patient satisfaction.

CONCLUSION
Laparoscopic myomectomy is a substitute for abdominal myomectomy in properly selected patient. It provides the surgical advantage of magnification of anatomy and pathology with low complication rate in experienced hands. Patient advantage includes decreased postoperative pain, reduced hospitalization, low rate of ileus and infection.
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Laparoscopic myomectomy enables minimally invasive approach to be used for sub serous and intramural myoma of average size and few in number2-5.When surgeon is sufficiently experienced, risk of perioperative complications is low. It has the advantage of decreased risk of hemorrhage and adhesions. With experienced surgeon in endosuturing, scar quality can also be improved. However risk of recurrence is higher with laparoscopy than with open myomectomy because of difficulty in detecting small intramural fibroid during laparoscopic surgery.

Laparoscopic myomectomy that adheres to open surgical principles can be achieved through robotic assisted laparoscopic myomectomy[12]. Although absence of tactile feedback may be viewed as a limitation, improved visualization and instrument dexterity along with three dimensional imaging overcome any difficulty encountered with dissection and this may become the gold standard for treating leiomyoma in recent future.

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