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Technology Update

Robotic myomectomy – tips & tricks

Rooma Sinha [a,*], Madhumati Sanjay [b], B. Rupa [c], Samita Kumari [d]

[a] Senior Consultant, Department of Minimally Invasive Gynecology, Apollo Health City, Hyderabad, India
[b] Consultant, Department of Minimally Invasive Gynecology, Apollo Health City, Hyderabad, India
[c] Senior Registrar, Department of Minimally Invasive Gynecology, Apollo Health City, Hyderabad, India
[d] Resident (DNB), Department of Obstetrics & Gynecology, Department of Minimally Invasive Gynecology, Apollo Health City, Hyderabad, India

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ABSTRACT

Fibroid is a common problem in women of reproductive age group. Myomectomy remains the gold standard method in treating fibroids where uterine conservation is desired. With advent of minimally invasive techniques, laparoscopic myomectomy becomes the obvious method of choice. However it is not a very popular surgery because of technical challenges especially the need for extensive suturing. Introduction of robotic technology helps the surgeon to follow open surgical steps and addresses the technical challenges of conventional laparoscopic suturing and knot tying. Myomectomy is a suture-intensive surgery and assistance with robotic arms makes suturing simple and easy. This article discusses some of the tips and tricks of performing robotic myomectomy in the areas of pre operative assessment & MRI, port placement & docking, hybrid procedure, dealing with associated sub mucous fibroids and variations in suturing techniques. Pre operative MRI of the pelvis is helps in identifying the number and location of all the fibroids. The primary port is placed in the midline. The rest of the ports are placed 10 cms apart in an inverted "W" fashion. Hybrid technique is a variation in robotic myomectomy where a conventional laparoscopic enucleation of the myoma is followed by reconstruction with the da Vinci robot. Assosciated submucous fibroids can be removed by hysteroscopy myomectomy, however large type 2-sub mucous fibroid has been removed with robotic approach. Use of unidirectional knotless barbed suture substantially facilitates closure of uterine defects during minimally invasive myomectomy and may offer additional advantages such as minimizing operative time.

Fibroid is a common problem in women of reproductive age group. Myomectomy remains an important option for fertility & uterine preservation in young women. While uterine artery embolization and MRI-guided focused ultrasound are also methods that are becoming popular in managing fibroid uterus, myomectomy remains the gold standard method. Myomectomy has being a part of medical management for decades and we have long term data of good reproductive outcome following it. With advent of minimally invasive techniques, laparoscopic myomectomy becomes the obvious method of choice. But the question remains – why still so many open myomectomies are being performed all over the

* *Corresponding author.*
E-mail addresses: drsanjaysinha@hotmail.com, drroomasinha@hotmail.com (R. Sinha).
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world? There is no doubt that a laparoscopic approach is more advantageous than laparotomy, however laparoscopic suturing is more demanding. This can be overcome by robotic-assisted laparoscopic myomectomy.[1] A retrospective case study from the Cleveland Clinic confirmed these findings when investigators compared surgical outcomes between the robot-assisted laparoscopic approach, standard laparoscopy, and open myomectomy. In an assessment of 575 cases (393 open, 93 laparoscopic, and 89 robot-assisted laparoscopic), they found the robot-assisted laparoscopic approach to be associated with the removal of significantly larger myomas (as compared to standard laparoscopy), as well as lower blood loss and shorter hospitalization when compared to open myomectomy.[2]

It is accepted beyond doubt that minimally invasive gynecological surgeries have distinct advantages for the patient for its minimal access and comfort. However laparoscopic myomectomy is a technically challenging surgery and good outcomes are possible only by high volume surgeons who have exceptional skills. The need for extensive suturing in myomectomy is the main limitation in its wide spread acceptance by surgeons. *Post operative implications in a myomectomy surgery is also due to the fact that* poor closure of incisions or excessive use of diathermy can lead to uterine rupture in future pregnancies.[3,4] Robotic surgery is a natural progress in the field of minimally invasive surgery. As robotic surgery allows surgeon to perform detailed surgery due to magnified 3D vision and deep reach into the pelvis that a robotic telescope can achieve. There fore a new technology of robotic assistance is slowly gaining ground. The da Vinci has EndoWrist technology with increased instrument range of motion (7°) enabling the surgeon to mimic open surgical techniques. Other advantages of robotic technology over conventional laparoscopy are absence of tremor, superior instrument articulation, downscaling of movements, and comfort for the surgeon.[5] The fact that robotic arms helps the surgeon to follow open surgical steps, addresses the technical challenges of conventional laparoscopic suturing and knot-tying. But the robotic technology cannot just simplify the challenges that leiomyoma's can pose, including enucleation of large myomas and suturing. Although it has facilitated the adoption of endoscopic myomectomy, the da Vinci system requires an experienced gynecologic endoscopic surgeon with good knowledge of surgical anatomy. Compared with open abdominal myomectomy, the robot-assisted laparoscopic approach is associated with less blood loss, lower complication rates, and shorter hospitalization.[6] Reproductive outcomes in pregnancies and deliveries are similar to open myomectomy. Pitter et al studied these outcomes, reporting 92 deliveries out of 107 patients studied with only 1 uterine rupture.[7] After robotic myomectomy successful term pregnancy has also been reported by Bocca et al., in 2007.[8]

Having being exposed to robotic technology for the last 2 years, today Robotic assisted myomectomy is one of our favorite surgeries. The reasons for this are that *myomectomy is a suture-intensive surgery and assistance with robotic arms makes suturing simple and easy. Robotic myomectomy guarantees a procedure that is as effective as a classic open myomectomy. Robotic assisted surgery is as safe and acceptable as a laparoscopic operation.* This article discusses the tricks & tips of doing robotic assisted myomectomy in a systematic, safe, and efficient manner.

We shall discus these in the following areas-

1. Pre operative assessment & MRI
2. Port placement & docking
3. Hybrid procedure
4. Dealing with associated sub mucous fibroids
5. Variations in suturing techniques

1. Pre operative assessment

Careful patient selection and a good preoperative assessment are vital for the success of the minimally invasive myomectomy procedures. It gives details of size, location & number of fibroids. It is difficult to assess this on a 2D scan and even on 3D scan if the fibroids are multiple and large volume, one can miss locating them preoperatively. Pre operative MRI of the pelvis is suggested before Robotic myomectomy. In fact we would suggest reviewing the MRI scan at the console with an experienced radiology collogue gives details that may otherwise get missed by the surgeon. During surgery it becomes difficult to remove all fibroids if the locations are not known from before. This information also helps in the counseling session before surgery, as women with solitary fibroid or a few large fibroids, or pedunculated fibroids are good candidates and full clearance is possible Fig. 1. Diffuse fibromas, adenomyoma, adenomyosis with very little normal myometrium, are poor surgical candidates and these should be identified preoperatively Fig. 2. Although there are no limits on the number of fibroids that can be removed (maximum of 9 fibroids in our series), multiple seedlings disseminated throughout the uterus are not the right candidates for myomectomy. Adenomyomectomy is also possible with

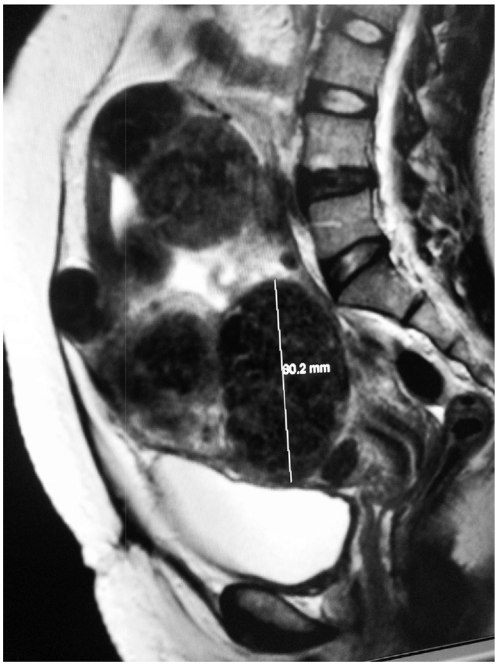

Fig. 1 – MRI T2 WEIGHTED IMAGE – sagittal image of multiple fibroids.