



## Closure of laparoscopic myomectomy

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### Abstract

Myomectomy is surgery to remove uterine fibroids. It is recommended when fibroids become symptomatic or when they are causing complaints. Complications include heavy menstrual bleeding, Iron deficiency anemia, pelvic pain and pressure symptoms. Laparoscopic myomectomy is one of the techniques feasible for the treatment of intramural myoma. Several studies established that there are various advantages of laparoscopic myomectomy over the laparotomic and mini-laparotomic approaches for the treatment of uterine myomas. One of the most difficult issues regarding the laparoscopic myomectomy is suturing the myoma bed. Although there are considerable advances in suture materials, all of them need to be applied with surgical knot. Surgical knots have many drawbacks as the reduce tensile strength of the suture material by thinning and stretching it. Also, weakest point of a suture is the knot and second weakest point are point immediately adjacent to the knot. Another big problem of the laparoscopic knots is that the volume of surgical knot is directly related to the total amount of inflammatory reaction in surrounding tissue. Finally laparoscopic tied knots are weaker than those tied by the hand in open surgeries. Hence an ideal suture should eliminate the need for knotting. The myomectomy incision repair needs a suture that adequately addresses the need for an optimal wound closure and minimal tissue reaction. So, new suturing technique with new suture material as the barbed suture will be very helpful.

**Keywords:** laparoscopic myomectomy, bidirectional barbed suture, the conventional suture.

### Short review

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### 1. Introduction

Uterine myomas, also known as leiomyomas or fibroids, are very common in women of childbearing age. Intramural myomas are the most common type (58–79%) among all the observable uterine myomas [1]. Other types of myomas like subserous may need myomectomy only if they caused complications [2]. The quality of life may be affected because of myomas due to menorrhagia, dysmenorrhea, and pelvic pain [3]. Myomectomy is the surgical treatment for symptomatic fibroids with uterine conservation. Myomectomy can be done by Laparotomy, mini-laparotomy or minimal access techniques as laparoscopy [4]. Since 1990 laparoscopic myomectomy (LM) has been proved to be an effective alternative to the open surgery for intramural and subserous myomas when surgical correction was decided [5]. However, LM has been the subject of many controversies and debates because of lack of experience which may lead to excessive blood loss, prolonged operation time, postoperative complications, especially when multiple myomas are involved [6]. The operative technique comprises four main phases; hysterotomy, enucleation, suturing of myomectomy bed and extraction of the myoma [7]. The most important and difficult step is suturing of myomectomy bed because of the need of rapid technique, and fear of excessive blood loss. Many new methods were introduced for reducing bleeding during myomectomy such as uterine artery ligation and

injection of vasoconstrictor agents; however, excessive hemorrhage during myomectomy remains a major challenge for the surgeon [8]. With a fast-suturing technique, the myometrium remains open for less time, thereby reducing intraoperative bleeding during myomectomy. Suturing and knot tying are challenging laparoscopic skills that require extensive training [9].

### 2. Sutures History:

Sutures the first historical records of wound closure with suture material are found as far back as 5,000-3,000 BC. They used Natural elements like flax, silk and cotton as suture material [10]. Later on, a new material was used. In 1907, It was a sterilized catgut suture made of sheep intestine. It was a major innovation in suture material. Another innovation in suture material was the introduction of absorbable synthetic suture in 1970s [11]. Later on, after the development of synthetic polymers and fibers, a synthetic suture was used. These sutures can be manufactured by polymer configuration, the type of fiber and its size, surface lubricant, coating with antiseptic chemicals made it possible to develop many types of it [12]. Each type of these sutures has a specific usage, depending on the surgical site, technique and the preference of the surgeon. The surgical sutures available now can be broadly classified as natural and synthetic. Also, they can be sub classified as absorbable and

non-absorbable. For practical purposes, these different categories of sutures were believed to help surgeons in choosing the proper suture material for their surgeries are [13].

### 3. Barbed Suture:

Barbed suture has been recently introduced to facilitate laparoscopic suturing. A suture with bidirectional barbs offers several advantages over conventional sutures. It is self-anchoring and is balanced by the countervailing barbs, and hence, no knots are required [14]. It self-anchors every 1 mm of tissue, yielding more consistent wound opposition; this may result in a more “watertight” seal. Because it is knotless, it can securely re-approximate tissues in less time, at less cost, and with less aggravation [15]. In unidirectional barbed suture the cuts in the suture are made in one direction and this will result in the barbs facing in one direction. A needle is swathed at one end and the other end has a tiny loop which is used to secure the suture at the beginning of suturing. The barbs in the suture anchor the material at every barb approximately every one mm. As it is self-anchoring there is no need to knot the suture at the ends [16]. The tensile strength is effectively distributed through-out the suture and thus eliminating the weak points that affect the knots and adjacent to the knots. This constant distribution of tension along the suture line allows it to possess a greater breaking strength compared to the conventional suture [17].

Nowadays, barbed sutures are used in many other surgical fields for various indications. Some examples of its indications, the suture can be used in dermal tissue approximation, internal wound closure, and tendon repair and others. Use of barbed suture in laparoscopic procedures has increased in the last few years. Present studies evaluate the efficacy of barbed suture in closure of myoma bed, in terms of ease of the procedure, time saving and decreasing the blood loss. The “baseball” suture technique has been described as an alternate option to the classical suture, affording advantages such as reduced suturing time, simple to perform, single-layer suture, reduced dead-space formation, and complete closure of the wound incision. In this technique, the needle is inserted initially into the bottom of the incision on each side leading to a final aspect similar to the stitches on a baseball [18].

### 4. Conclusions

Bidirectional barbed suture can shorten the operation time and blood loss during LM. This suture has barbs that maintain the tensile strength without knots and this makes suturing more easy.

### References

- [1] S. Alborzi, E. Ghannadan, S. Alborzi, M. Alborzi. (2009). A comparison of combined laparoscopic uterine artery ligation and myomectomy versus laparoscopic myomectomy in treatment of symptomatic myoma. *Fertility and sterility*. 92 (2) 742-747.
- [2] C.C. Chu, J.A. von Fraunhofer, H.P. Greisler. (2018). *Wound closure biomaterials and devices*. CRC Press.
- [3] U.A. Dietz, F. Kehl, W. Hamelmann, C. Weißer. (2007). On the 100th anniversary of sterile catgut Kuhn: Franz Kuhn (1866–1929) and the epistemology of catgut sterilization. *World journal of surgery*. 31 2275-2283.
- [4] P. Giampaolino, N. De Rosa, G.A. Tommaselli, F. Santangelo, C. Nappi, A. Sansone, G. Bifulco. (2015). Comparison of bidirectional barbed suture Stratafix and conventional suture with intracorporeal knots in laparoscopic myomectomy by office transvaginal hydrolaparoscopic follow-up: a preliminary report. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 195 146-150.
- [5] J.A. Greenberg, J.I. Einarsson. (2008). The use of bidirectional barbed suture in laparoscopic myomectomy and total laparoscopic hysterectomy. *Journal of minimally invasive gynecology*. 15 (5) 621-623.
- [6] L. Hashemi, S. Hart, M. Morseon. (2012). Comparison of surgery time and cost in using barbed suture versus the traditional suture in robotic hysterectomy: a retrospective cohort study. *Journal of Minimally Invasive Gynecology*. 19 (6) S6.
- [7] J.A. Greenberg. (2010). The use of barbed sutures in obstetrics and gynecology. *Reviews in Obstetrics and Gynecology*. 3 (3) 82.
- [8] C. Jin, Y. Hu, X.C. Chen, F.Y. Zheng, F. Lin, K. Zhou, H.Z. Gu. (2009). Laparoscopic versus open myomectomy—a meta-analysis of randomized controlled trials. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 145 (1) 14-21.
- [9] S.S. Kadiramanathan, J.C. Shelton, C.C. Hepworth, J.G. Laufer, C.P. Swain. (1996). A comparison of the strength of knots tied by hand and at laparoscopy. *Journal of the American College of Surgeons*. 182 (1) 46-54.
- [10] D.J. Levine, J.M. Berman, M. Harris, S.G. Chudnoff, F.S. Whaley, S.L. Palmer. (2013). Sensitivity of myoma imaging using laparoscopic ultrasound compared with magnetic resonance imaging and transvaginal ultrasound. *J Minim Invasive Gynecol*. 20(6):770–774.
- [11] V. Mais, S. Ajossa, S. Guerriero et al. (1996). Laparoscopic versus abdominal myomectomy: a prospective, randomized trial to evaluate benefits in early outcome. *American Journal of Obstetrics and Gynecology*. 174:654–658.
- [12] W.M. Liu, C.R. Tzeng, C. Yi-Jen, P.H. Wang. (2004). Combining the uterine depletion procedure and myomectomy may be useful for treating symptomatic fibroids. *Fertility and Sterility*. 82:205–210.
- [13] S. Alborzi, E. Ghannadan, S. Alborzi, M. Alborzi. (2009). A comparison of combined laparoscopic uterine artery ligation and myomectomy versus laparoscopic myomectomy in treatment of symptomatic myoma. *Fertility and Sterility*. 92:742–747.

- [14] A. James, M.D. Greenberg. (2010). The Use of Barbed Sutures in Obstetrics and Gynecology. *Reviews in Obstetrics and Gynecology*. 3(3):82-91.
- [15] L. Hashemi, S. Hart, M. Morseon. (2012). Comparison of Surgery Time and Cost in using Barbed Suture versus the Traditional suture in Robotic Hysterectomy: A retrospective cohort study. *Journal of Minim Invasive Gynecology*. 2012:19 (SUPPL): S6.
- [16] J.A. Greenberg, J.I. Einarsson. (2008). The use of bidirectional barbed suture in laparoscopic myomectomy and total laparoscopic hysterectomy. *Journal of Minim Invasive Gynecol*. 15(5):621–623.
- [17] M.C. Vassiliose, L.S. Feldman, C.G. Andrew et al. (2005). A Global Assessment Tool for Evaluation of Intra Operative Laparoscopy Skills. *American Journal of Surgery*. 190:107-113.
- [18] R.M. Rashid, M. Sartori, L.E. White, M.T. Villa, S.S. Yoo, M. Alam. (2007). Breaking strength of polypropylene sutures: rater blinded controlled comparison with non-barbed sutures of various calibers. *archives of Dermatology*. 2007:143;869-872.