

Minimally Invasive Laparoscopic Myomectomy for 3-kg Giant Uterine Leiomyomas: A Case Report

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ABSTRACT:

Giant uterine leiomyomas, typically defined as fibroids larger than 10 cm or weighing more than 1,000 g, are uncommon and present significant surgical challenges due to increased vascularity, distorted pelvic anatomy, and the risk of massive hemorrhage. Traditionally, these tumors have been managed through laparotomy. However, advances in minimally invasive surgery have expanded the role of laparoscopic myomectomy in selected cases. Herein we report the case of a 29-year-old nulliparous woman who presented with progressive abdominal enlargement. Physical examination revealed a markedly enlarged uterus corresponding to a 36-week gestation. Magnetic resonance imaging demonstrated a giant anterior wall subserosal leiomyoma measuring 15.75 × 17.6 × 19.98 cm (FIGO type 6). The patient underwent laparoscopic myomectomy with pre-incisional vasopressin infiltration for hemorrhage control. A 20-cm fibroid was successfully enucleated through a fundal incision and removed using manual morcellation. The uterine defect was reconstructed with a two-layer closure. Operative time was 200 minutes, with an estimated blood loss of 1,600 mL requiring transfusion of two units of whole blood. The excised specimen weighed 3,175 g. The postoperative course was uneventful, and the patient was discharged on postoperative day two.

Keywords: Giant uterine fibroid, giant myoma, laparoscopic myomectomy, minimally invasive surgery, leiomyoma, fertility preservation.

Introduction

Uterine leiomyomas, or fibroids, are the most common benign gynecologic tumors, with an estimated cumulative incidence of over 70% in women of reproductive age (Rogers et al., 2021). These tumors are monoclonal in origin, arising from smooth muscle cells of the myometrium,

and are influenced by estrogen and progesterone (Marsh et al., 2018). Clinically, fibroids may remain asymptomatic or cause significant symptoms such as abnormal uterine bleeding, pelvic pain or pressure, infertility, and recurrent pregnancy loss (Lumsden et al., 2015).

While most fibroids are relatively small, large fibroid typically with size more than 10 cm or weigh more than 1 kg are uncommon but can severely distort the uterus and pose technical challenges during surgical management (Donnez & Dolmans, 2016). These challenges include limited intraoperative visibility, increased vascularity, risk of massive hemorrhage, longer operative times, and difficulties in fibroid retrieval (Younes et al., 2021). For these reasons, open abdominal myomectomy or hysterectomy has traditionally been favored, especially in low-resource settings or when fertility preservation is not a concern (Ferrero et al., 2022).

However, recent advances in laparoscopic instrumentation, surgical skills, and hemostatic techniques such as vasopressin injection, temporary uterine artery occlusion, and use of barbed sutures—have expanded the indications for laparoscopic myomectomy to include even large and multiple fibroids (Zullo et al., 2020). In high-volume centers with experienced surgeons, Laparoscopy myomectomy has been shown to offer comparable safety and efficacy to open surgery while providing benefits such as reduced postoperative pain, faster recovery, and shorter hospital stays (Zhang et al., 2023; Younes et al., 2021).

Despite these advances, the role of LM in managing giant leiomyomas remains controversial. Some studies report increased conversion rates and higher intraoperative risks in such cases, especially when the tumor size exceeds 15 cm or when multiple fibroids are present (Ferrero et al., 2022). Additionally, concerns regarding uterine wall integrity and future pregnancy outcomes after extensive laparoscopic suturing remain relevant, especially in women desiring fertility (Uccella et al., 2018).

We present a case report of a 29-year-old nulliparous woman with symptomatic giant uterine leiomyomas who underwent laparoscopic myomectomy at a tertiary academic hospital in Indonesia. This report aims to demonstrate the feasibility and safety of LM in large fibroid cases, highlighting the operative strategies and outcomes, and contributing to the evolving evidence base supporting minimally invasive approaches in complex gynecologic surgery.

Case Presentation

Case 1

A 29-year-old nulliparous woman presented with abdominal enlargement and large uterine mass was found on ultrasound examination. The uterus was enlarged 36 week of gestational age. Patient was obese with weighs 99 kg and BMI 38,2 kg/m². MRI revealed a giant 15,75 x 17,6 x 19,98 cm subserous fibroid leiomyoma FIGO type 6 in anterior wall with mass urging the bowel superiorly with a firm border and no adhesions visible (Figure 1). Laparoscopic myomectomy was performed with infiltration of vasopressin 20 IU which was diluted in 200 ml saline. Myoma was found to be 20 cm in diameter FIGO type 6 and enucleated via ellipse fundal incision then extracted through manual morcellation. The defect was closed in two layers with synthetic monofilament surgical suture. Operative time was 200 minutes and EBL was estimated at 1600 cc. Patient received 2 bag whole blood intraoperative transfusion. The specimen weight retrieved was 3175 g. intraabdominal drain was installed with minimal production. Post operative course was uneventful and the patient was discharged 2 days after operation.

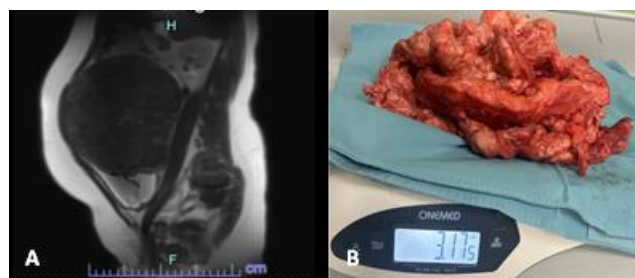


Figure 1. A. MRI imaging B. Extracted myoma through manual morcellation weighing 3 kg

Discussion

Laparoscopic myomectomy (LM) has evolved significantly in the past decade, enabling its application to increasingly complex cases, including giant fibroids exceeding 10 cm in diameter or weighing more than 1000 grams. Once considered a relative contraindication due to concerns over operative visibility, increased vascularity, and morcellation challenges, recent data suggest that LM can be safely and effectively performed in selected patients with large fibroids by experienced surgical teams (Zhang et al., 2023; Ferrero et al., 2022).

Numerous studies have demonstrated that LM for large leiomyomas results in reduced blood loss, faster postoperative recovery, and shorter hospital stays compared to open myomectomy, with comparable complication rates (Younes et al., 2021; Zullo et al., 2020). In our case series, all patients with large myomas underwent successful laparoscopic procedures without conversion to laparotomy, reaffirming the growing body of evidence that size alone should not be considered an absolute contraindication for LM. Furthermore, enhanced recovery protocols combined with minimally invasive surgery have been associated with shorter hospitalization, even increased same-day discharge rates (Peters, et.al., 2020)

However, a critical determinant of the safety and success of LM in giant fibroids is comprehensive preoperative imaging. Proper imaging evaluation—using modalities such as pelvic MRI, transvaginal ultrasonography, and contrast-enhanced abdominal ultrasound—is indispensable for accurately assessing the size, number, location, vascularity, and relationship of fibroids to adjacent pelvic structures (Shu et al., 2020; Lee et al., 2021). Preoperative mapping guides key decisions including trocar placement, surgical approach, and enucleation order, while also enabling surgeons to anticipate difficulties and prepare for appropriate intraoperative strategies.

MRI, in particular, is a valuable imaging modality for the diagnosis of giant uterine myomas as it provides superior soft tissue contrast and

anatomical detail, aiding in the differentiation of myomas from adenomyosis or malignancy. MRI also accurately delineates the size, location, vascularity, and relationship of the tumor to adjacent pelvic structures and in detecting degeneration or intraligamentary extension that may complicate dissection (Romani, Martinetti and D'Amato, 2021; Kido et al., 2018). Furthermore, vascular imaging can help predict bleeding risk, allowing for the consideration of adjuncts such as vasopressin injection or temporary uterine artery occlusion (Donnez & Dolmans, 2016).

Without adequate imaging, fibroid size and location may be underestimated, potentially resulting in intraoperative surprises, suboptimal surgical planning, or even conversion to laparotomy. As such, preoperative imaging should be regarded not merely as a diagnostic tool, but as a critical component of preoperative triage and surgical roadmap development (Lee et al., 2021).

Additionally, success in LM for large fibroids depends on intraoperative expertise, including advanced laparoscopic suturing skills, use of energy devices, and specimen retrieval techniques such as contained morcellation or mini-laparotomy extraction (Uccella et al., 2018). These technical refinements have expanded the indications for LM and reduced complications such as bleeding and uterine rupture in future pregnancies.

In summary, the feasibility of laparoscopic myomectomy for large and even giant fibroids is increasingly supported by contemporary literature. Nonetheless, a high-quality imaging assessment is indispensable to ensure safety, guide surgical planning, and optimize outcomes. Our experience aligns with other literature suggesting that surgeon experience and careful case selection are the most important determinants of success in laparoscopic myomectomy for large fibroids.

Conclusion

Laparoscopic myomectomy for large uterine fibroids is a feasible and safe option in experienced hands. Individualized planning, proper technique, and advanced laparoscopic

skills are key to managing such challenging cases with optimal outcomes.

Further prospective studies are recommended to evaluate long-term fertility outcomes and recurrence rates in this patient population.

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