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Huge Broad Ligament Fibroids - A Diagnostic Dilemma and Surgical Challenge

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1. Introduction

Uterine fibroids are also known as uterine leiomyoma or myomas.Uterine leiomyoma are benign monoclonal tumors arising from smooth muscle tissue. Uterine leiomyomata are one of the most common indications for gynecologic surgery, leading to 200,000 hysterectomies and 30,000 myomectomies per year. (1)

The real incidence of broad ligament fibroids is not known. (2)

Types of Broad Ligament Fibroids
Broad ligament fibroids are divisible into two types: (3)

True Broad Ligament Fibroids:
These spring from the muscle fibers normally found in the mesometrium. Such tumours may be found in at least three situations,

1) In the round ligament
2) In the utero-ovarian ligament
3) In the connective tissue surrounding the ovarian and the uterine vessels.

As compared to the first two, the last one can attain a very big size and can distort the fallopian tubes. However, they are entirely separate from the uterus, hence can displace, but not distort the uterus.

False Broad Ligament Fibroids:
These originate mostly from the lateral walls of the uterus or cervix.

Symptoms
These lesions may manifest as extrauterine pelvic masses that compress the urethra, bladder neck, or ureter producing symptoms of varying degrees of urinary outflow obstruction or secondary hydroureteronephrosis. (4)

Broad ligament fibroids are associated with pseudo-Meigs syndrome and they can produce elevated cancer marker CA-125 levels, leading to diagnostic confusion with metastatic ovarian carcinoma. (5)

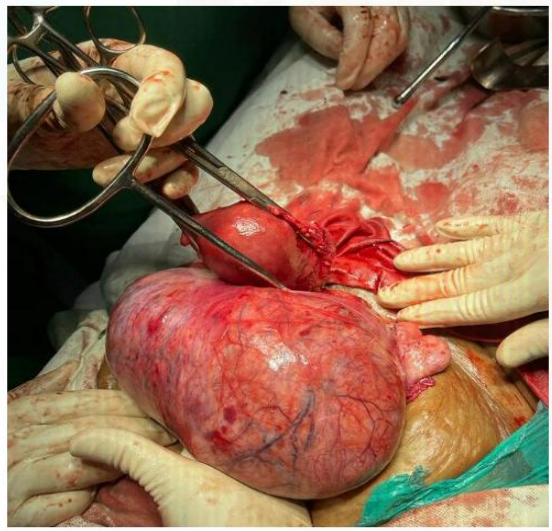
Because a broad ligament leiomyoma grows outside of the uterus, and it does not increase the surface area of the endometrium or pressure on venous drainage,most cases with a broad ligament leiomyoma are asymptomatic. However, the broad ligament leiomyoma usually has the characteristics of remarkably increased vascularity and low growth resistance. When it is neglected for a long time and reaches an enormous size, it may distort the anatomy of the pelvis and push the uterus to the contralateral side, resulting in chronic pelvic pain, compression of adjacent structures like the bladder, ureter, and the bowel, such as bladder and bowel dysfunction or hydronephrosis. At the same time, when the leiomyoma outgrows its blood supply, various degenerative changes occur. (6)

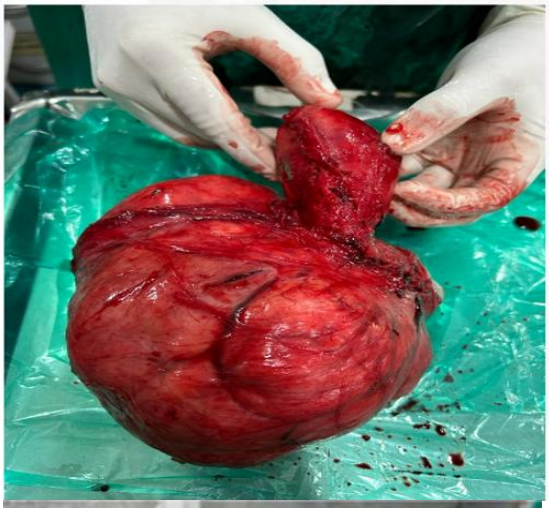
Differential Diagnosis (7)

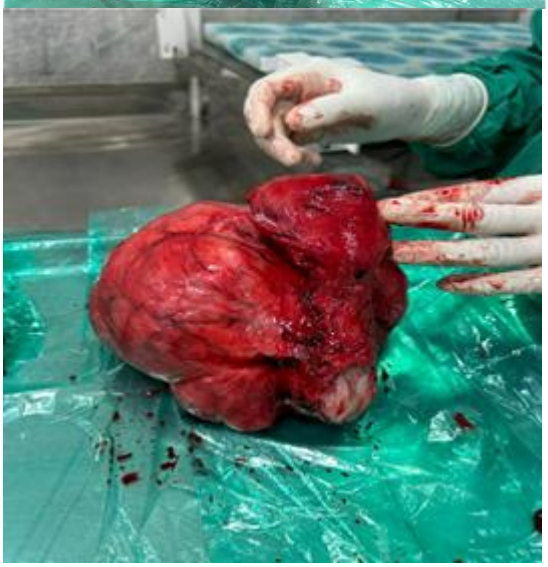
1) 1-Parasitic leiomyoma involving the broad ligament
2) 2-Subserosal pedunculated leiomyoma projecting towards broad ligament.
3) 3-Ovarian fibroma or fibrothecoma
4) 4-Brenner tumour
5) 5-Neurofibroma in the pelvis
6) 6-Tubo-ovarian mass

We would like to discuss here series of three interesting cases of large broad ligament fibroids which were evaluated and successfully managed in our hospital.

Case 1
A 48-year-old P2L2 with previous 2 LSCS presented with complaints of pain in abdomen for 6 months. On examination,a mass was palpated approximately 26-28 weeks size, non-tender, the lower limit of which could not be reached. The tumour markers were within normal limits.USG was done which was suggestive of bulky uterus and a large oval solid mass in pelvis more on right side measuring approximately 18 X 8.3 X 12.9 cms with homogenous echotexture. Her CT report was suggestive of broad ligament fibroid on right side. Patient was then posted for exploratory laparotomy and was given a vertical incision. A large fibroid was present posteriorly to the uterus in the retroperitoneum measuring approximately 20 X 15 X 10 cms, present more on the right side, the lower limit of which could not be reached easily due to the presence of adhesion bands present between the mass and the omentum. Patient underwent Total Abdominal Hysterectomy with excision of broad ligament fibroid and sent for HPR. The weight of the fibroid was approximately 5-6 kgs.After excision ureteric peristalsis was checked on both sides and retrograde bladder filling was done to see for any bladder injuries. Intraperitoneal drain was kept. The procedure was uneventful and patient was discharged on 14th post operative day after suture removal. The HPR report came as leiomyoma.







Case 2

A 46-year-old P2L2 presented with complaints of pain in abdomen and menstrual irregularities for 1 year. On examination, a mass palpated approximately 28-30 weeks size and non-tender. The tumour markers were normal. USG was done which was suggestive of multiple intramural fibroids largest measuring 9x8cms on the right lateral wall. MRI was done which was suggestive of bulky uterus with adenomyotic changes with multiple intramural fibroids largest measuring 9.4X10.8X11.3cms on the left lateral wall and 8X7X7 cms in the right lateral wall and multiple small intramural fibroids. Patient was then posted for TAH and a Pfannenstiel incision given. Uterus was bulky measuring approximately 16-18 weeks size. A large broad ligament fibroid was seen on the left side measuring approximately 10X10X15cms which was mobile and not adherent to the surrounding structures. Patient underwent TAH with excision of the broad ligament fibroid and was sent for HPR. The weight of the fibroid was approximately 4-5 kgs. After excision ureteric peristalsis checked on both sides. The procedure was uneventful and the patient was discharged on 12th post operative day after suture removal. HPR report came as leiomyoma.

Case 3

A 47-year-old P2L2 presented with complaints of dull aching pain in abdomen on and off. No complaints of menstrual irregularities. On examination, a mass was palpated approximately 22-24 weeks size, non-tender. USG was done which was suggestive of a right adnexal mass measuring approximately 10.5 X 11 X 10cms with normal uterus with differential diagnosis of complex ovarian tumor or fibroid. The tumour markers were within normal limits. MRI was done which was suggestive of mildly bulky uterus with a large broad ligament fibroid on the left side measuring approximately 12 X 11 X 10cms. Patient was then posted for TAH and Pfannenstiel incision given. Uterus was normal size. Bilateral tubes and ovaries were normal. A large fibroid was seen in the left broad ligament, seen separately from the uterus with no adhesions to the surrounding structures measuring approximately 12 X 10 X 10cms. Incision was made in the anterior leaf of the broad

ligament and the fibroid dissected out and sent for HPR. Bleeding from the fibroid bed was controlled by pressure, using injection vasopressin prior to the excision and injection tranexamic acid. Patient underwent TAH. The weight of the fibroid was approximately 5-6kgs. The procedure was uneventful and the patient was discharged on the 14th post operative day after suture removal. The HPR report came as leiomyoma.

Diagnostic Challenges

There is a great challenge posed by broad ligament fibroids at pre-operative imaging. The lack of awareness of the surgical significance of broad ligament fibroids may be reflected in the large number of cases being under reported. There should be a high level of suspicion of a broad ligament fibroid if a fibroid is reported as lateral.

Broad ligament fibroids also present a diagnostic challenge on imaging. Appearing adnexal in location, they may be confused with ovarian tumours or may have an alternative histological diagnosis following myomectomy; a suspected broad ligament fibroid was reported as a pelvic schwannoma at histology. (8)

Ultrasonography

There is a challenge posed on ultrasound in accurately identifying fibroids within the broad ligament. This may reflect a lack of awareness among radiologists of the surgical significance of broad ligament location.

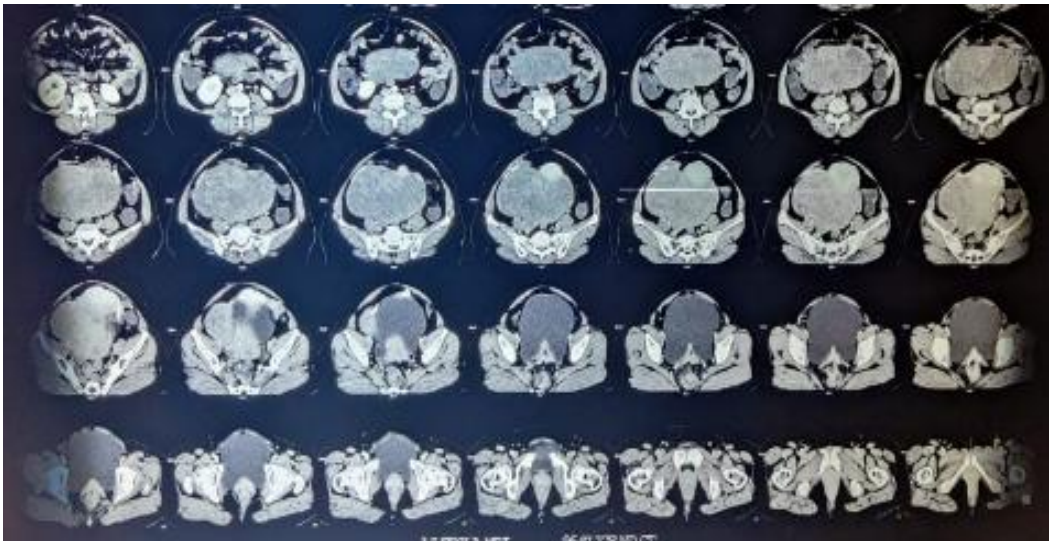
Standardising ultrasound criteria for broad ligament fibroids may improve detection. Various standards can be applied to adnexal masses that are suspected to be broad ligament fibroids, such as size, vascularity and anatomical relationship to the uterine arteries or other pelvic sidewall structures. Ultimately though, the rarity of broad ligament fibroids, and the potential for misdiagnosis as ovarian or retroperitoneal tumours makes the development of standardised ultrasound criteria extremely difficult. (8)

MRI

There is a superior sensitivity of MRI in assessing uterine fibroids. All fibroids initially reported as lateral should be further evaluated by MRI to improve the detection rates of broad ligament fibroids.

Magnetic resonance imaging (MRI), with its multiplanar imaging capabilities, may be extremely useful for differentiating broad ligament fibroids from masses of ovarian or tubal origin and from broad ligament cysts. The distinctive MRI appearances of typical fibroids also are useful in differentiating them from solid malignant pelvic tumours. (9)

Typical fibroids demonstrate low to intermediate signal intensity on T1-weighted images and low signal intensity on T2-weighted images. Myxoid degeneration and necrosis may be visible as high signal intensity areas on T2-weighted images. Another common variant seen on both T1-weighted and T2-weighted images is a cobblestone-like appearance due to hyaline degeneration, with high signal intensity foci representing areas of infarction due to rapid growth. (9)



Intravenous Pyelography

False broad ligament fibroid - originates from uterus but grows laterally between the two layers of the broad ligament with attachment to the uterus. Uterine vessels and ureter lie lateral to fibroid.

True broad ligament fibroid - arises from muscle fibres normally found in the mesometrium. Ureter is medial to the mass. (10)

Measures to Decrease Blood Loss

In both of our cases the blood loss was approximately 250-300ml. No blood transfusion was given to the patients. We had used injection ADH (vasopressin) around the fibroid wall. Diluted adrenaline injection can also be used. Both agents cause the blood vessels to constrict and minimizes bleeding which further facilitates dissection.

Tranexamic acid can also be used preoperatively to decrease blood loss.

Another option is the use of Gonadotropin-releasing hormone (GnRH) or ulipristal acetate as a preoperative measure for large myomas in order to reduce the risk of hemorrhage. Usually with treatment for 6–8 weeks, fibroids shrink by 30–50%. The use of these agents should not exceed the 6–8 weeks, as they can obscure the tissue planes between fibroids and the myometrium, making enucleation difficult and increasing the chance of myoma recurrence. Once this agent is discontinued, myoma regrowth occurs; hence the timing of the operation close to the end of the treatment is necessary. Both the cost of the medication and the risk of cleavage plane lost must be weighed against the benefits when deciding whether to use them. (11)

Similarly, temporary bilateral uterine artery clipping can reduce blood supply and bleeding during myoma excision.

Uterine artery embolization will have little or no effect on the broad ligament leiomyoma since this type of fibroid does not necessarily rely on the uterus for its blood supply, which is why it can exist outside the confines of the uterus. (12)

Operative Technique

While operating massive broad ligament fibroids, one must keep in mind several key factors. The retroperitoneal space can serve as a reservoir, which can house a very large specimen. The surgeon should therefore keep in mind that the specimen can be much larger than its initial appearance. This space can also hold significant amount of blood, and hence, meticulous haemostasis early in the case is vital. Due to the complex anatomy in this region and proximity to other vital structures (i.e., ureters, internal iliac and obturator vessels, and nerves), the surgeon must pay close attention during dissection.

In such cases where the broad ligament fibroid is extremely large the anatomy can be significantly distorted. The surgeon will not know exactly how the ureter has been displaced (laterally, superiorly, inferiorly etc.), and therefore, attempts for locating and dissecting out the ureter may be futile and dangerous.

We therefore recommend that the surgeon should “hug” the fibroid and stay close while dissecting and enucleating the tumour. This way, as the peripheral structures are falling away from the specimen, visualization of the surrounding anatomy may become more familiar. (11)

As the fibroid is being dissected and pulled out of the broad ligament, one can try to “walk the specimen” to enhance grip providing traction, which will enhance visualization beyond the edge and horizon of the tumour. (11)

Surgical Challenges

The risk factors contributing to intraoperative bleeding are insufficient use of vasoconstrictive agents, fibroid size, fibroid position, number of fibroids, failure to identify the cleavage plane, failure to identify the feeding vessel, insufficient haemostasis, lack of precision in suturing, loose knotting, and surgeon inexperience.

The incision can be vertical or Pfannenstiel depending on the surgeon. The incision length depends on the size of the fibroid and its orientation. Incision can be made on the anterior or posterior leaf of the broad ligament. The selection of the incision area, orientation, and length will determine

the degree of difficulty of myoma enucleation, suturing, and amount of bleeding.

Control of bleeding is of paramount importance after myoma enucleation. Bipolar diathermy is preferable to monopolar diathermy, as it targets only the big vessels and causes less destruction to healthy myometrium. Haemostasis should be avoided for micro bleeders in order to facilitate healing process. Excessive coagulation and carbonization should be avoided since it can be detrimental to myometrial healing.

Haemostasis and approximation are a bigger challenge when concomitant pathologies exist like focal adenomyosis, adenomyoma or in large intramural fibroids.

Use of antiadhesive barriers may reduce the risk of postoperative adhesion formation. However, good surgery with respect to minimal destruction and handling of the healthy tissue, avoiding unnecessary organ manipulation, controlled bleeding, minimal coagulation, and reasonable operating time remain the best ways to diminish the risk of adhesion formation. (12)

Adhesion formation may be reduced using oxidized regenerated cellulose (Interceed), expanded polytetrafluoroethylene (Gore-Tex), and sodium hyaluronate with carboxymethylcellulose (Seprafilm).

Laparoscopic Myomectomy

A laparoscopic myomectomy is performed through the abdomen by the surgeon or via robotic-assisted technology. The success of a laparoscopic myomectomy is directly tied to the surgeon's experience and expertise as it is a technically challenging procedure. One of the biggest challenges is the skill required to properly suture the uterus following the surgery. (13)

A woman with subserosal fibroids would be a good candidate for a laparoscopic myomectomy.

Most experts believe that fibroids no larger than 9-10 centimetres (about 4 inches) should be the criteria for determining eligibility for a laparoscopic myomectomy. A laparoscopic myomectomy may not be a feasible option to eliminate fibroids that are large, numerous, or deeply embedded. (13)

Patients who have a laparoscopic myomectomy generally experience fewer complications than those who undergo an open myomectomy, and their recovery is a bit shorter. The typical recovery time after a laparoscopic myomectomy is 4 to 5 weeks. (13)

Although there are fewer risks associated with laparoscopic myomectomy versus an open myomectomy, there are always risks involved in any surgical procedure. Some risks include: (13)

- Adverse reaction to general anaesthesia;
- Damage to nearby organs;
- Excessive bleeding/blood transfusion;
- Infection;
- Uterine puncture;
- Inability to completely remove the fibroids;
- Weakening of the uterus (may rupture during a vaginal birth);
- Development of scar tissue inside the uterine cavity that could cause fertility issues.

2. Conclusion

Broad ligament fibroids are unusual pelvic tumours that can cause difficulties in diagnosis as they mimic malignant tumours and surgical management due to their locations and sizes.

Huge Broad ligament fibroids being comparatively rare are frequently underreported at pre-operative evaluation and require a high level of suspicion.

Broad ligament fibroids usually pose a high level of surgical dilemma with respect to their large size and proximity to other vital structures.

The successful outcome of such procedures depends on adequate pre operative evaluation of the patient and on the surgical expertise of the surgeon.

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