Leiomyoma through History: An Overview

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Background

Leiomyomas or Uterine fibroids are benign tumors that originate from the smooth muscle of the uterus and represent the most common tumor of the female reproductive tract with estimated incidence of around 50% [1]. They affect women of reproductive age and tend to regress following menopause [2].

Pathophysiology

Myomas can be single or multiple and can vary in size, location, and perfusion; commonly classified into 3 subgroups based on their location: subserosal (projecting outside the uterus), intramural (within the confines of the uterine musculature) and submucosal (encroaching upon the uterine cavity). They are well circumscribed tumors but without a capsule, rather they have a pseudocapsule, which is a neurofibrovascular structure containing many neuropeptides and neurotransmitters, which are important for reproductive and sexual functions [3].

Location wise they are much less often in the cervix than the uterine corpus, may develop in round ligament, albeit rare. Further, they can be parasitic/wandering fibroids (Figure 1), epitheloid, intraligamentary (broad ligament). In some cases large intraligamentary fibroids are located outside pelvis and form a type of retroperitoneal tumor [4] (Figure 2).

Risk Factors

Being an oestrogen dependent tumour, it is common in older nulliparous women with early menarche and the risk decreases with each pregnancy. Specific clinical conditions, such as hypertension or diabetes and obesity put a greater risk. Smoking categorically is protective to such tumors [5].

Clinical Picture

Although, majority being asymptomatic, less than 50%, may present with abnormal bleeding depending upon their size, site and number [6]. Other usual presentations may be due to pressure symptoms resulting into urgency, frequency or sometimes even urinary incontinence. On the contrary, it may be urinary retention with overflow incontinence due to urethral or bladder neck compression.

Fibroids are not so common a cause of infertility and are a culprit in only 3% of cases. Fibroids that give a call for infertility are the ones with diameter more than 50mm, located near cervix or tubal ostium or submucosal ones. Further, a cause of alarm is pregnancy related complications. Reviews suggest an increased risk of spontaneous abortions, premature delivery, malpresentation, stillbirth, abruption placenta and post-partum haemorrhage. Moreover, there are a few uncommon symptoms and presentations allocated to them like ascites, pseudo-Meig’s syndrome, Polycythemia and deep vein thrombosis. Some women may complain of pelvic discomfort, heaviness, Dyspareunia and/ or non-cyclic pelvic pain or simply abdominal distention [3,7]. Association of onset of pain and/or bleeding in postmenopausal women calls for considering sarcoma’s changes in a previously silent leiomyoma [8].

Complications

Apart from hyaline, hydropic, myxoid and fatty degeneration, red degeneration (specific to pregnant uterus), cases may land up with calcification, infection, suppuration, necrosis and sarcomatous degeneration (0.7%). Other complications that can sometimes accompany an otherwise innocent myoma are intrabdominal bleeding, uterine torsion, hydroureter/hydronephrosis, urinary retention, renal failure, venous thromboembolism or mesenteric vein thrombosis [3].
Evaluation

Imaging techniques [9], including Transvaginal and abdominal ultrasonography, sonohysterography, hysterosalpingography, hysteroscopy, and magnetic resonance imaging (MRI) [10], are helpful to confirm the clinical suspicion.

Management

Various treatment modalities ranging from medical, minimally invasive to conservative surgeries and hysterectomy are available. A basket of modalities can be made available to the patient and choice can be made depending upon individual’s need and requirements for preservation of fertility and or the uterus. According to certain studies, indication is that 3% to 7% of small asymptomatic untreated fibroids regress over 6 months to 3 years in pre- and peri-menopausal women [11].

Medical Management

Anti inflammatory, oral Contraceptives and progestins [12] form the basis for symptomatic relief from good olden times. Further therapies like levonorgestrel Intrauterine System (LNG-IUS) [12], Gonadotropin-Releasing Hormone Agonists, Gonadotropin-Releasing Hormone Antagonists [13], Aromatase Inhibitors(Letrozole), Estrogen Receptor Antagonists [14], Selective Estrogen Receptor Modulators (SERMs), Selective Progesterone Receptor Modulators (SPRMs) and Mifepristone [15].

Ulipristal acetate

Has been shown to exhibit antiproliferative effects on myometrial cells and the Endometrium [16].

Surgical Therapies

The ideal surgical treatment should satisfy three goals: relief of signs and symptoms, sustained reduction of fibroid size, and maintenance or improvement of fertility.

Pre-surgical Medical Approaches

Medical treatments are often used to control bleeding, shrink fibroid bulk, reduce uterine size, and increase the hemoglobin level prior to surgery.

Conventional Surgical Approaches

Hysterectomy

Hysterectomy remains the most common surgical treatment whether it is performed by abdominal, laparoscopic, or vaginal route, should be based on surgeon’s training, experience, and comfort and on clinical practice guidelines [17]. According to surveys, in the United States, leiomyomas account for approximately one third of hysterectomies performed annually [18].

Myomectomy

Myomectomy is an alternative to hysterectomy for women who wish to retain their uterus, regardless of their fertility desire. Removal of fibroids should be considered if they are thought to be associated with heavy menstrual bleeding, pelvic pain and/or pressure symptoms, and in some cases reproductive issues [19]. Women should be counseled about the risks of requiring a hysterectomy at the time of a planned myomectomy. This would depend on the intraoperative findings and the course of the surgery.

Can be intraabdominal, intracapsular myomectomy [20], hysteroscopic myomectomy [12], laparoscopic myomectomy [21] limited by number and size of fibroid and, at times, caesarean myomectomy [22].

Other Approaches can be Robotic assisted laparoscopy [12] and mini-laparotomy hysterectomy [23].

Intraoperative Adjuncts

Like vasopressin, bupivacaine and epinephrine, misoprostol, peri-cervical tourniquet, or gelatin-thrombin matrix have been used for reduction of blood loss during myomectomy procedures. Other Conservative Treatments like uterine artery embolization (UAE) and endometrial ablation [24] are also reliable options.

Focused Energy Delivery Systems, MR-guided focused ultrasound and Radiofrequency myolysis are the newer developments.

To Summarize

Uterine fibroids are one of the common gynaecological concerns in fertile age group women, especially over 40s

Although many women with leiomyomas may be free of symptoms, whereby, necessitating no immediate intervention, those who become symptomatic can experience significant morbidity and a deterioration of their quality of life.

Uterine fibroids mostly cause abnormal bleeding problems and other symptoms might impact poorly on women’s life, influencing their sexual, social and work life.

Invasive surgical treatments have long been the mainstay of the management of Leiomyoma like myomectomy (conservative) or hysterectomy (definitive).

Uterine artery embolization is one of the currently available and futuristic conservative interventional treatments which have depicted effectiveness.

Of late, focused energy delivery methods have shown encouraging results.

Recent evidence regarding ulipristal acetate suggests the agent may hold potential capability in the long-term management of leiomyomas.

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References