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Uterine fibroids

Definition

Uterine fibroids are the most common solid pelvic tumor in women, estimated to occur in 77% of women of reproductive age.¹ Patients with fibroids commonly present with menorrhagia²⁻⁴ and pelvic pressure symptoms. The physical, emotional, and social lives of fibroid patients may be negatively affected.

Treatments:

Hysterectomy

Historically, hysterectomy has been performed as the definitive treatment for symptomatic fibroids symptoms providing complete and effective relief of symptoms. Using Center for Disease Control and Prevention data⁵ and a cohort study⁶ would predict 234,000 hysterectomies for fibroids in 2002. Symptom relief following hysterectomy has been associated with a marked improvement in quality of life.^{6,7} This surgical procedure does present many risks with complications including death, transfusions, deep vein thrombosis, intraabdominal abscess, surgical wound abscess, sepsis, bowel or bladder trauma requiring repair, pulmonary embolism/infarct, myocardial infarction or cardiac and/or respiratory arrest.⁸ Hysterectomy is also associated with lengthy hospital stays and long recovery.

Myomectomy

Myomectomy has become a surgical alternative to hysterectomy for conservation of the uterus for reproductive or nonreproductive reasons. Although not a global uterine treatment, myomectomy typically removes more than one fibroid and provides symptom reduction.^{9,10} Myomectomy is plagued with high fibroid recurrence rates^{9,10} and with small bowel adhesions.^{11,12} Thus, myomectomy successfully relieves the symptoms of fibroids, but it does not affect the underlying process.¹³

Drug Therapy

Drug therapy with gonadotropin-releasing hormone (GnRH) agonist therapy has been used to shrink uterine fibroids prior to myomectomy by suppressing estrogen and progesterone production and by the direct effect of GnRH agonist on fibroid tissue. Even though GnRH agonists can temporarily shrink fibroids, the suppression of ovarian production of estrogen and progesterone causes patients

treated with GnRH agonists to experience the unpleasant symptoms of menopause. Letterie et al¹⁴ reported the rate of GnRH agonist related side-effects including hot flashes (78%), vaginal dryness (32%) and transient frontal headaches (55%). Despite a significant decrease in uterine and fibroid volume and decrease in menorrhagia while on therapy, fibroid and uterine volumes rapidly return to pre-treatment sizes and menorrhagia recurs in all patients within one or two months after discontinuing GnRH agonist therapy. GnRH agonists, thus, only provide temporary relief from fibroid symptoms.

Uterine Artery Embolization

Bilateral uterine artery embolization (UAE) is an angiographic, uterine sparing procedure designed to stop blood flow to the uterus. This procedure, performed by interventional radiologists, involves catheterization of both uterine arteries under fluoroscopic (x-ray) visualization, and injection of either polyvinyl alcohol (PVA) particles or acrylic co-polymer (trisacryl) cross-linked with gelatin. Three-month data on 538 women from the Ontario Uterine Fibroid Embolization Trial showed significant improvements in fibroid-related symptoms including menorrhagia.¹⁵

Many publications have reported complications from particles flowing to organs and tissues other than fibroids. For example, embolic particles intended to reach the uterus instead reached the buttocks resulting in gluteal muscle pain¹⁶ and ischemia¹⁷ as well as necrosis.¹⁸ Ryu et al¹⁹ reported complete loss of detectable ovarian arterial circulation in the majority of patients undergoing UAE. When the plastic particles are on target, embolization has also resulted in serious adverse events relating to diffuse uterine necrosis requiring hysterectomy.²⁰ Patient deaths have also been reported as a result of uterine artery embolization.²¹⁻²⁵ These studies suggest that UAE of the uterine arteries is a successful treatment option for symptomatic uterine fibroids, but the adverse events are numerous, widespread, and can be fatal.

ExAblate®

The ExAblate employs a focused ultrasound beam that heats and destroys the uterine fibroid tissue using high-frequency, high-energy sound waves. This system, operated by a radiologist, uses magnetic resonance imaging (MRI) and a thermal mapping system to visualize patient anatomy, map the volume of fibroid tissue to be treated, and monitor the temperature of the uterine tissue after heating. This device is not recommended for fibroids near sensitive organs such as the bowel or bladder. Initial results show a mean fibroid shrinkage rate of 13.5% at 6 months with a 79.3% reduction in the symptoms.²⁶ Total uterine volume results were not reported. Adverse events described with the ExAblate 2000 system included nerve injury/leg pain, bowel symptoms, bladder symptoms and skin injury. Effects on the composition and strength of the uterine tissue are not completely understood.²⁷