

Review Article

Current Trends of Alternatives to Hysterectomy in Adenomyosis: A Review Article

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Abstract:

Adenomyosis is a common gynecological problem characterized by the growth of endometrial glands and stroma within the myometrium. Previously, the definitive diagnosis of adenomyosis was made through histopathology after a hysterectomy. However, in the last two decades, several uterine-sparing treatment options have emerged, including High-Intensity Focused Ultrasound (HIFU), which has become a promising option. HIFU is a non-invasive local thermal ablation technique that can be performed via ultrasound or MRI guidance. Additionally, "Laparoscopic uterine artery occlusion with uterus sparing pelvic plexus block and partial adenectomy for adenomyosis" has become a popular option. While conventional adenomyomectomy carries a high risk of recurrence and uterine rupture, some novel surgical techniques have been described to mitigate these complications and preserve future fertility. There are also "new surgical techniques of laparoscopic resection of adenomyoma under real-time intraoperative ultrasound elastography guidance". Diagnostic imaging techniques such as transvaginal ultrasound, MRI, and hysteroscopic evaluation have revolutionized the diagnosis of adenomyosis and opened up possibilities for conservative treatment options. Hysteroscopy can be used for direct visualization and biopsy collection, though it is not the first-line treatment option. With the increasing incidence of adenomyosis and the desire for fertility preservation among younger patients, there is a growing need for effective uterine-sparing treatments.

Key words: Adenomyosis, High-Intensity Focused Ultrasound (HIFU), Conventional Adenomyomectomy, Fertility preservation, Laparoscopic uterine artery embolization, Hysteroscopic evaluation.

Introduction:

Adenomyosis is a benign uterine disorder characterized by the ingrowth of endometrial tissue, including both functional glands and stroma, into the myometrium. The submucosa is absent, and the endometrial glands extend beyond the endometrial interface, forming nests within

the myometrium and causing myometrial hyperplasia around the endometrial foci¹. The condition was first described by Carl Van Rokitansky, a German pathologist, in 1860¹ and is estimated to affect 8.8-31% of women².

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In case of leiomyoma 75 % cases are asymptomatic, whereas about two-thirds of women with adenomyosis present with symptoms such as menorrhagia and severe dysmenorrhea, often accompanied by fertility concerns^{2,3}. This condition is distressing for patients and at the same time a clinical challenge for gynecologists, as symptoms may persist even after treatment and there is a risk of recurrence^{2,4}.

Although conservative treatments offer options for fertility preservation, successful pregnancy outcomes are not always possible due to the estrogen-dependent nature of the disease and the high recurrence rates^{1,5}. Hysterectomy was traditionally considered the gold standard for definitive management of adenomyosis. However, due to increasing number of patients presenting in early reproductive age with a desire for fertility, alternative treatment options have emerged.

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Advancements in diagnostic imaging techniques have revolutionized the diagnosis of adenomyosis, allowing for the formulation of various conservative treatment approaches.

Aims and Objectives:

The aim of this article is to review the current trends of uterus-sparing alternative treatment options rather than hysterectomy in the management of adenomyosis. The increasing incidence of adenomyosis highlights the need of utilization of the available options for treating the condition, preserving fertility, and improving patient outcomes.

Materials and Methods:

The current study was a systematic review of the literature that examined alternative treatments to hysterectomy for the management of adenomyosis. Relevant articles were identified through a comprehensive search of PubMed and MEDLINE databases, covering a ten-year period from January 2010 to December 2020.

The search strategy employed a combination of keywords including “adenomyosis”, “hysterectomy”, “uterus-sparing treatments”, “conservative management”, “medical treatment”, “interventional procedures” and related terms. The search was limited to articles written in English and included clinical trials, observational studies, systematic reviews and meta-analyses.

The inclusion criteria for the articles were studies that reported on the alternative treatments to hysterectomy in the management of adenomyosis, including medical treatment, minimally invasive procedures and other conservative management options. The exclusion criteria were articles that reported on hysterectomy as the sole treatment for adenomyosis, case reports, and opinion articles.

Two authors independently screened the titles and abstracts of the articles identified in the search to determine their eligibility for inclusion in the study. Any discrepancies in the selection were resolved through discussion and consensus. The full-text articles were then reviewed to extract relevant data, including the type of treatment, study design, patient population, and outcomes. The data were analyzed and synthesized to provide a comprehensive overview of the current trends in alternative treatments for adenomyosis.

Medical treatment:

The medical management of adenomyosis has made significant advancements over the past decade, with the introduction of innovative treatment options such as the levonorgestrel-releasing intrauterine device (LNG-IUD), gonadotropin-releasing hormone analogues (GnRHa), oral contraceptives, and non-steroidal anti-inflammatory drugs (NSAIDs)⁶. However, despite these advancements, the high cost and recurrence rate associated with medical treatment, along with the potential for significant side effects, has led to a loss of confidence among both physicians and patients¹.

High Intensity Focused Ultrasound (HIFU) technique:

The High Intensity Focused Ultrasound (HIFU) technique is a non-invasive ablation procedure for local treatment of adenomyosis. This technique uses ultrasound beams that are focused into the targeted tissue, causing coagulative necrosis through an increase in temperature to 65°C. HIFU can be performed using ultrasound imaging, which provides real-time anatomic imaging and is less costly¹. Alternatively, MRI-based HIFU enhances safety and efficiency.

Inclusion criteria for HIFU were: (1) a confirmatory diagnosis through transvaginal ultrasound (TVS) and MRI, (2) symptomatic patients with menorrhagia or dysmenorrhea, (3) a size of the adenomyotic lesion greater than 3 cm, (4) informed consent from the patient, and (5) the patient's ability to communicate with the physician^{1,5}.

HIFU is contra-indicated during pregnancy, lactation, and menstruation, and may not be feasible in cases of extensive pelvic endometriosis or if malignancy or dense adhesions with the gut are present¹. MRI has a crucial role in the HIFU process as it is used to measure the thickness of the abdominal wall and accurately locate the adenomyotic lesion². Each patient should undergo an MRI evaluation before and after the procedure.

The success of the HIFU procedure depends on several factors, with the Non-Perfused Volume (NPV) ratio being of particular importance. The NPV is calculated as the non-perfused volume divided by the adenomyotic volume and is related to the long-term efficacy of the procedure¹.

Studies have shown that HIFU can effectively reduce the primary symptoms of adenomyosis, with an effectiveness rate of 85% in the first 3 months and 65%

in 5-year follow-up⁵. HIFU also decreases local inflammatory factors, which are considered responsible for menorrhagia and dysmenorrhea, and reduces the uterine volume while preserving fertility.

While HIFU is generally safe, still there are some side effects such as lower limb movement disorder, urinary retention, vaginal bleeding, and bowel perforation⁵. In some studies, adjuvant treatment with gonadotropin-releasing hormone analogues (GnRH_a) or Mirena has been shown to increase the efficacy of HIFU.

After reviewing the studies on HIFU, it can be stated that it is a safe and effective method for treating adenomyosis while preserving the uterus for future fertility. Further meta-analyses are required to assess the efficacy, safety, cost-effectiveness, and success rate of pregnancy after HIFU⁵.

Uterine artery embolization:

Uterine Artery Embolization (UAE) is a minimally invasive alternative to surgery for the treatment of symptomatic adenomyosis. It was first introduced in 1995 for the treatment of symptomatic uterine leiomyomas⁷. Several studies have reported positive results regarding UAE as a treatment option for uterine leiomyomas, leading to its investigation for adenomyosis⁸⁻¹¹. The short-term outcomes of UAE for pure adenomyosis and adenomyosis with leiomyomas range from 83.3% to 92.9%¹². Long-term results show significant symptomatic improvement in 64.9% of cases for pure adenomyosis and 82.4% for adenomyosis with leiomyomas¹². Although hysterectomy offers full symptom relief, UAE offers significant symptomatic relief with minimal side effects, cost-effectiveness benefits, and the ability to retain fertility, making it an attractive treatment option. However, larger-scale, randomized trials producing high-quality data are necessary to determine the true value of UAE as a treatment for adenomyosis and validate it as a potential first-line treatment option for women who wish to retain their fertility and opt for a minimally invasive approach¹².

Recent updated technique in adenomyomectomy:

For young women who are concerned about preserving their fertility, adenomyomectomy can be performed via laparotomy or laparoscopy. The recurrence rate of adenomyosis is high due to the lack of a clear plane of resection and difficulties in resection and reconstruction techniques. In recent years, various novel adenomyomectomy techniques have been developed

that offer improved efficacy and reduced complications. One such technique, described by Abo TalebSaremi et al.¹³, involves complete removal of the adenomyotic lesion via a vertical incision in the midline of the anterior wall extending up to the endometrium. The thickness of the myometrium is then resected in laminate layers up to 0.5 cm on both the endometrial and serosal sides. The adenomyomectomy is then performed with care. In patients with lesions on both the anterior and posterior walls, the anterior wall is opened and the adenomyotic lesion is resected in a wedge shape, with a similar incision performed without opening the endometrium. This complete removal of the lesion through updated surgical techniques is associated with reduced recurrence rates and improved fertility rates¹³. Laparoscopic uterine artery occlusion combined with a uterine-sparing pelvic plexus block and partial adenomyomectomy has become a popular surgical option. This involves performing a laparoscopic partial adenomyomectomy in combination with bilateral uterine artery occlusion to reduce cooperative blood loss, followed by dissection of the uterine branch of the pelvic plexus and electro-coagulation blocking to reduce dysmenorrhea¹⁴. The scores for dysmenorrhea and menorrhagia are measured using a scoring system in all studies.

Hysteroscopic management of adenomyoma:

Hysteroscopic management of adenomyoma is not a first-line treatment option for symptomatic adenomyosis, but it does offer the advantage of direct visualization of the uterine cavity, reducing the amount of distortion caused by the adenomyoma. The diagnosis of adenomyoma can be made through the observation of irregular thickening of the endometrium with tiny openings, hypervascularization, a "strawberry" pattern of the endometrium, a fibrocystic appearance of the endometrium, and a hemorrhagic cyst in the form of dark blue or chocolate brown deposits^{15,16}. Hysteroscopic biopsy can also be performed to obtain a histopathological examination of the tissue. Superficial focal adenomyoma or cystic hemorrhagic lesions under 1.5 cm can be incised by an office hysteroscope. In the case of adenomyoma where lesions larger than 1.5 cm or diffuse or focal superficial adenomyosis, a resectoscope procedure may be indicated. Endometrial ablation may be performed concurrently with the hysteroscopic management, but this procedure will result in the loss of fertility. In addition, deep diffuse endometriosis cannot be managed by hysteroscopy¹⁷. Hysteroscopy can be used for the diagnosis and management of superficial adenomyoma, leading to an improvement in symptoms such as dysmenorrhea and menorrhagia by 81% and

50% respectively. However, the impact on pregnancy outcome is still sub-optimal and requires further study and refinement of the procedure.

Conclusion:

The current trend in the management of adenomyosis includes various alternatives to hysterectomy, including medical therapy, minimally invasive surgical procedures, and HIFU. Hysteroscopic management is a viable option for superficial adenomyoma, offering significant improvement in dysmenorrhea and menorrhagia. Uterine artery embolization has been investigated as a possible therapeutic option for adenomyosis, with short-term outcomes indicating promising results for symptomatic improvement. HIFU has also shown to be effective in reducing symptoms, with the advantage of being non-invasive and has the added benefit of retaining fertility. Further studies are required to determine the long-term outcomes of these treatments and their suitability as first-line options for adenomyosis management.

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