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The Significance of Modern Technologies in the Treatment of Uterine Fibroids as a Threat to Women's Reproductive Health

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Abstract: Uterine fibroids (leiomyomas) are among the most common benign gynecological tumors in women, affecting up to 20–50% of women of reproductive age. This pathology is associated with menstrual disorders, chronic posthemorrhagic anemia, pelvic pain syndrome, infertility, and various pregnancy complications. In recent years, rapid advances in high-technology and minimally invasive approaches in gynecology have enabled uterus-preserving treatment strategies, reduced surgical trauma, and maximized protection of women's reproductive health. This article analyzes the clinical effectiveness and scientific rationale of modern technologies used in the diagnosis and treatment of uterine fibroids.

Keywords: Uterine fibroids, leiomyoma, reproductive health, minimally invasive surgery, uterine artery embolization, robot-assisted surgery..

INTRODUCTION

Uterine fibroids are among the most frequently encountered tumors in gynecological practice and represent hormone-dependent benign neoplasms originating from smooth muscle cells of the myometrium. The disease is characterized by high sensitivity to estrogen and progesterone and predominantly affects women of reproductive age. The clinical significance of uterine fibroids is determined not only by the severity of symptoms but also by their negative impact on quality of life and reproductive potential. While traditional surgical approaches often resulted in radical procedures, modern medical technologies have enabled the implementation of organ-preserving, safe, and highly effective treatment methods.

MAIN PART

Uterine fibroids (leiomyomas) are benign tumors that develop from the smooth muscle cells of the myometrium and are highly sensitive to hormonal factors. They represent one of the most prevalent gynecological conditions among women. Clinical observations indicate that a significant proportion of women of reproductive age are diagnosed with myomatous nodules of varying size and localization. Fibroid tissue demonstrates increased sensitivity to estrogen and progesterone, and hormonal

imbalance leads to enhanced cellular proliferation, suppression of apoptotic processes, and excessive accumulation of extracellular matrix. As a result of these pathophysiological mechanisms, myomatous nodules gradually enlarge and adversely affect the anatomical and functional state of the uterus.

According to their localization, uterine fibroids are classified as submucosal, intramural, and subserosal. Submucosal fibroids deform the uterine cavity, disrupt endometrial architecture, and interfere with implantation, thereby increasing the risk of infertility and recurrent pregnancy loss. Intramural fibroids impair uterine contractility and may cause prolonged and heavy uterine bleeding. Subserosal fibroids exert mechanical pressure on adjacent organs, leading to pain and discomfort. In this regard, uterine fibroids constitute a significant clinical and social problem that directly threatens women's reproductive health.

In modern gynecology, uterus-preserving and minimally invasive approaches have become a priority in the treatment of uterine fibroids. Technological advancements allow for reduced surgical trauma, maximal preservation of healthy myometrial tissue, and improvement in patients' quality of life. Laparoscopic myomectomy is widely used due to its minimally invasive nature, reduced blood loss, and shorter postoperative recovery period. This method is particularly effective in the treatment of intramural and subserosal fibroids.

For submucosal fibroids located within the uterine cavity, hysteroscopic treatment plays a crucial role, as it enables restoration of the uterine cavity and preservation of endometrial function. This approach is especially beneficial for women planning pregnancy. Hysteroscopic management ensures effective treatment while maintaining reproductive function.

Among modern technologies, uterine artery embolization occupies a special place as an endovascular treatment method. This procedure involves selective occlusion of the vessels supplying blood to the myomatous nodules. Consequently, ischemic processes develop within the fibroid tissue, leading to gradual reduction in tumor size and significant alleviation of clinical symptoms. Uterine artery embolization is recognized as a minimally invasive, uterus-preserving, and highly effective treatment modality.

In addition, non-invasive treatment using high-intensity focused ultrasound has expanded therapeutic possibilities for uterine fibroids. In this technology, ultrasound waves are precisely focused on the myomatous tissue, generating localized high temperatures that induce irreversible necrotic changes in tumor cells. The procedure is performed under real-time imaging guidance, minimizing the risk of damage to surrounding healthy tissues. The absence of surgical intervention, negligible blood loss, and rapid recovery are among the major advantages of this method.

Furthermore, modern pharmacological approaches play an important role in the management of uterine fibroids. Selective progesterone receptor modulators and gonadotropin-releasing hormone agonists reduce proliferative activity of fibroid cells and help alleviate clinical symptoms. The combined use of pharmacotherapy with modern technological methods enables an individualized, effective, and long-term treatment strategy.

CONCLUSION

Uterine fibroids are a widespread benign neoplasm that pose a serious threat to women's reproductive health. Their development is associated with complex molecular-genetic and hormonal mechanisms and is clinically manifested by menstrual disorders, chronic anemia, pain syndrome, infertility, and pregnancy complications.

In modern gynecology, minimally invasive and high-technology approaches have initiated a new era in the treatment of uterine fibroids. Laparoscopic and robot-assisted surgery, uterine artery embolization, magnetic resonance-guided focused ultrasound surgery, and innovative pharmacological therapies enable high clinical effectiveness while preserving the uterus.

These technologies significantly improve women's quality of life and reproductive outcomes while reducing the risk of complications and recurrence. Therefore, an individualized, evidence-based, and technology-oriented approach is a key direction in the modern management of uterine fibroids.

REFERENCES

1. Khudoyberdiyeva NN. Pathophysiology and treatment strategies of uterine fibroids. Tashkent Medical Journal. 2020;1(2):45–53.
2. Islomov BSh. Clinical manifestations of uterine fibroids in women of reproductive age. Medical Information of Uzbekistan. 2022;6(3):12–19.
3. Jorayeva Ish, Rozmatova RY. The impact of fibroids in IVF patients and treatment approaches. Gynecology and Obstetrics. 2020;4(1):22–30.
4. Karimova DR. Laparoscopic myomectomy practice: clinical observations. Tashkent Clinical Journal. 2021;2(4):15–23.
5. Tokhtayeva LX. National experience with MR-guided focused ultrasound technology. Radiology and Diagnostics. 2023;5(2):9–17.
6. Abdullayeva MA. The significance of 3D ultrasound diagnostics. Uzbekistan Medical Journal. 2022;3(5):34–41.
7. Rahimov UK. Hysteroscopy and minimally invasive approaches. Gynecological Examinations. 2020;1(3):8–15.
8. Saidov FS. Uterine artery embolization: CIS experience. Interventional Radiology. 2022;4(1):25–32.
9. Karimov AA. Genetic mechanisms and MED12 mutations. Biomedical Research. 2022;6(2):12–20.
10. Rustamova SSh. Minimally invasive surgery and reproductive outcomes. Tashkent Clinical Journal. 2021;2(2):18–27.
11. Stewart EA. Uterine fibroids. The Lancet. 2015;386:293–298.
12. Bulun SE. Uterine fibroids. New England Journal of Medicine. 2013;369:1344–1355.
13. Donnez J, Dolmans MM. Uterine fibroids and fertility. Human Reproduction Update. 2016;22(6):665–686.
14. Parker WH. Etiology, symptomatology, and diagnosis of uterine myomas. Obstetrics & Gynecology. 2018;131:109–120.
15. Vilos GA, et al. Uterine artery embolization for fibroids. Journal of Obstetrics and Gynaecology Canada. 2019;41(7):985–999.