



ETIOLOGY AND PATHOMORPHOLOGY OF UTERINE FIBROIDS

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ANNOTATION

Uterine fibroids (leiomyomas) are the most common benign tumors of the female reproductive system and arise from the smooth muscle cells of the uterine myometrium. Their development is influenced by multiple factors including hormonal imbalance, genetic predisposition, growth factors, and environmental influences. Pathomorphologically, fibroids are characterized by well-circumscribed nodules composed of smooth muscle cells arranged in whorled bundles with varying degrees of fibrous connective tissue. Understanding the etiology and morphological characteristics of uterine fibroids is essential for improving diagnosis, prevention, and therapeutic strategies in gynecological practice.

Keywords; Uterine fibroids, leiomyoma, etiology, pathomorphology, myometrium, smooth muscle tumor, gynecological pathology

Relevance of the Topic. Uterine fibroids represent one of the most common gynecological diseases among women of reproductive age. Studies show that up to **60–70% of women may develop fibroids during their lifetime**. These tumors can cause significant clinical problems such as abnormal uterine bleeding, pelvic pain, infertility, and pregnancy complications. Understanding their etiology and pathomorphology is therefore important for early diagnosis and appropriate management.

INTRODUCTION

Uterine fibroids, also known as **leiomyomas or myomas**, are benign tumors originating from the smooth muscle cells of the uterine wall (myometrium). They are monoclonal tumors that develop due to abnormal proliferation of myometrial cells. Fibroids vary widely in size, number, and location within the uterus and are commonly classified as **intramural, submucosal, or subserosal** depending on their anatomical position.

Although uterine fibroids are benign and rarely undergo malignant transformation, they remain an important public health concern because of their high prevalence and impact on reproductive health. The pathogenesis of fibroids is complex and involves genetic, hormonal, and environmental factors.

MAIN PART

1. Etiology of Uterine Fibroids

The exact cause of uterine fibroids is not completely understood, but several etiological factors have been identified.

Hormonal Factors. Hormones play a major role in fibroid development. Estrogen and progesterone stimulate the proliferation of smooth muscle cells and promote fibroid growth. Fibroids usually develop during reproductive years and tend to regress after menopause, which supports the hormonal influence on tumor growth.

Genetic Factors. Genetic predisposition contributes significantly to the formation of fibroids. Approximately **40–50% of fibroids show chromosomal abnormalities**, and mutations in the **MED12 gene** are detected in a large proportion of cases. Women with a family history of fibroids have a higher risk of developing the disease.

Growth Factors and Cellular Signaling. Various growth factors such as insulin-like growth factors, epidermal growth factors, and transforming growth factors stimulate cell proliferation and

extracellular matrix production in fibroids. These molecules influence the growth and development of the tumor.

Environmental and Lifestyle Factors. Several external factors may contribute to fibroid development, including:

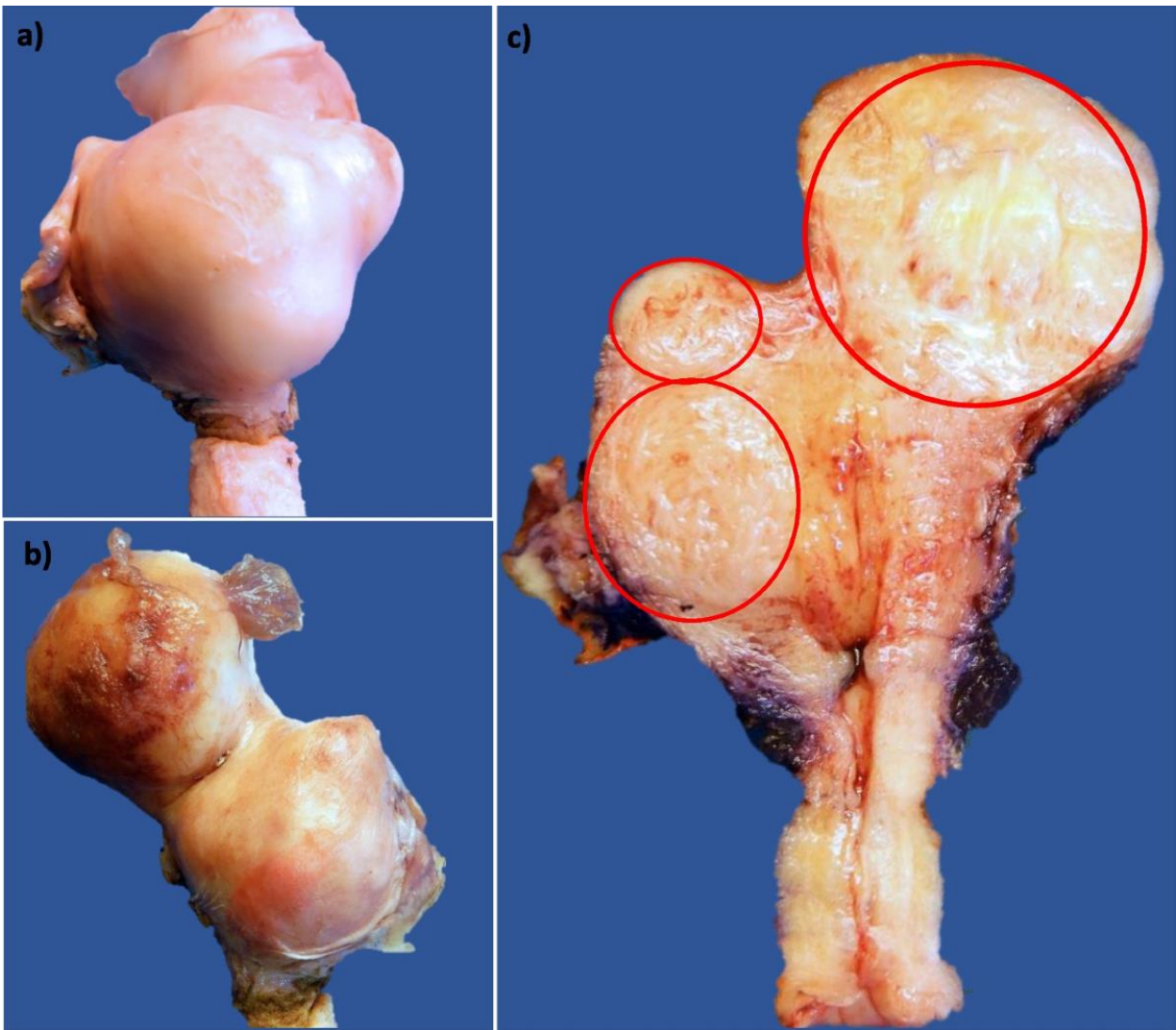
- Obesity
- Hypertension
- Diet and vitamin D deficiency
- Reproductive history

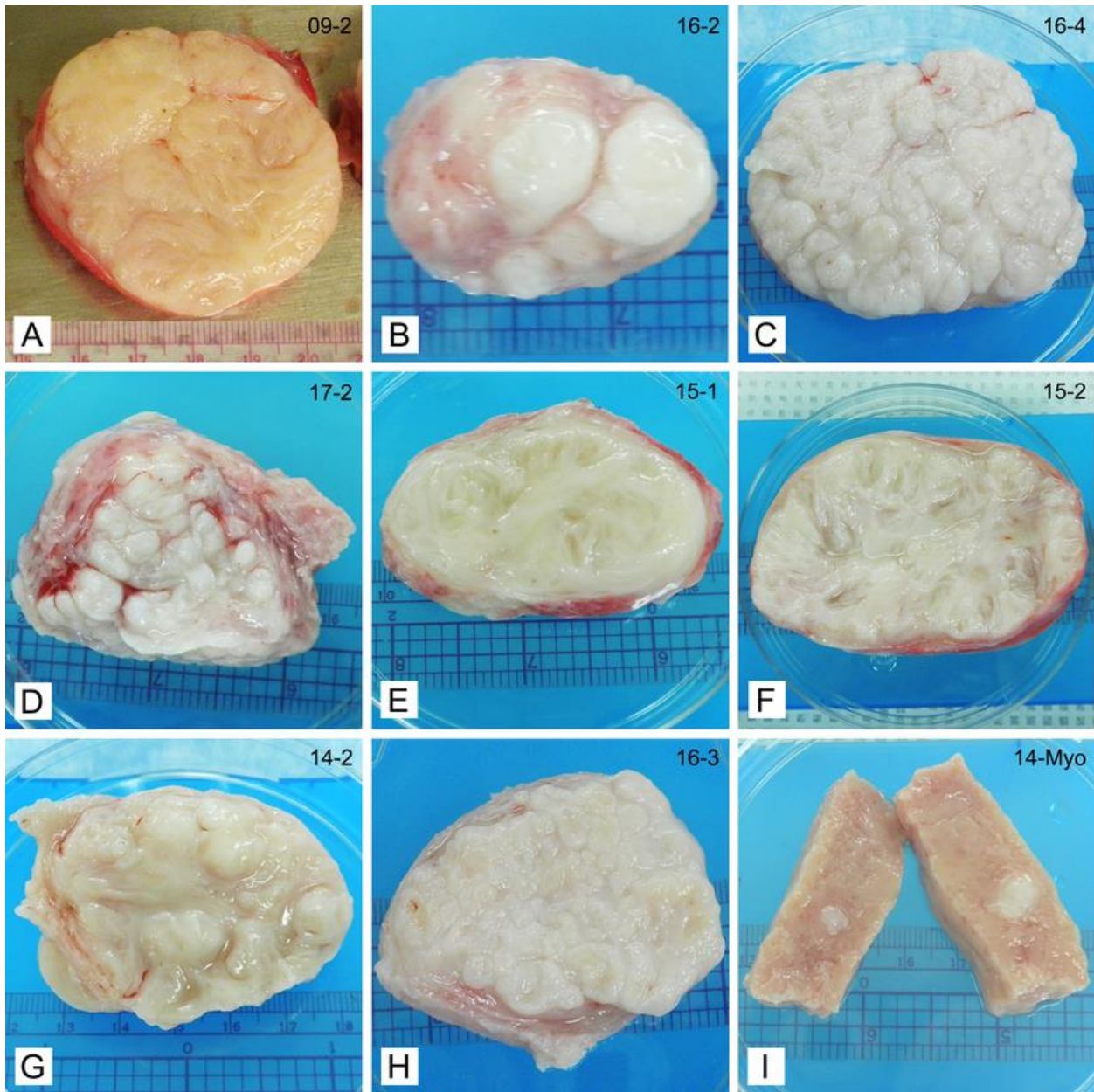
Women who have never given birth and those with metabolic disorders have an increased risk of fibroid formation.

2. Pathomorphology of Uterine Fibroids

Gross (Macroscopic) Morphology. Macroscopically, uterine fibroids appear as **well-circumscribed, firm, gray-white nodules** within the uterine wall. They are usually round and have a characteristic **whorled pattern on cut section**. The size of fibroids may vary from microscopic nodules to very large tumors that deform the uterus.





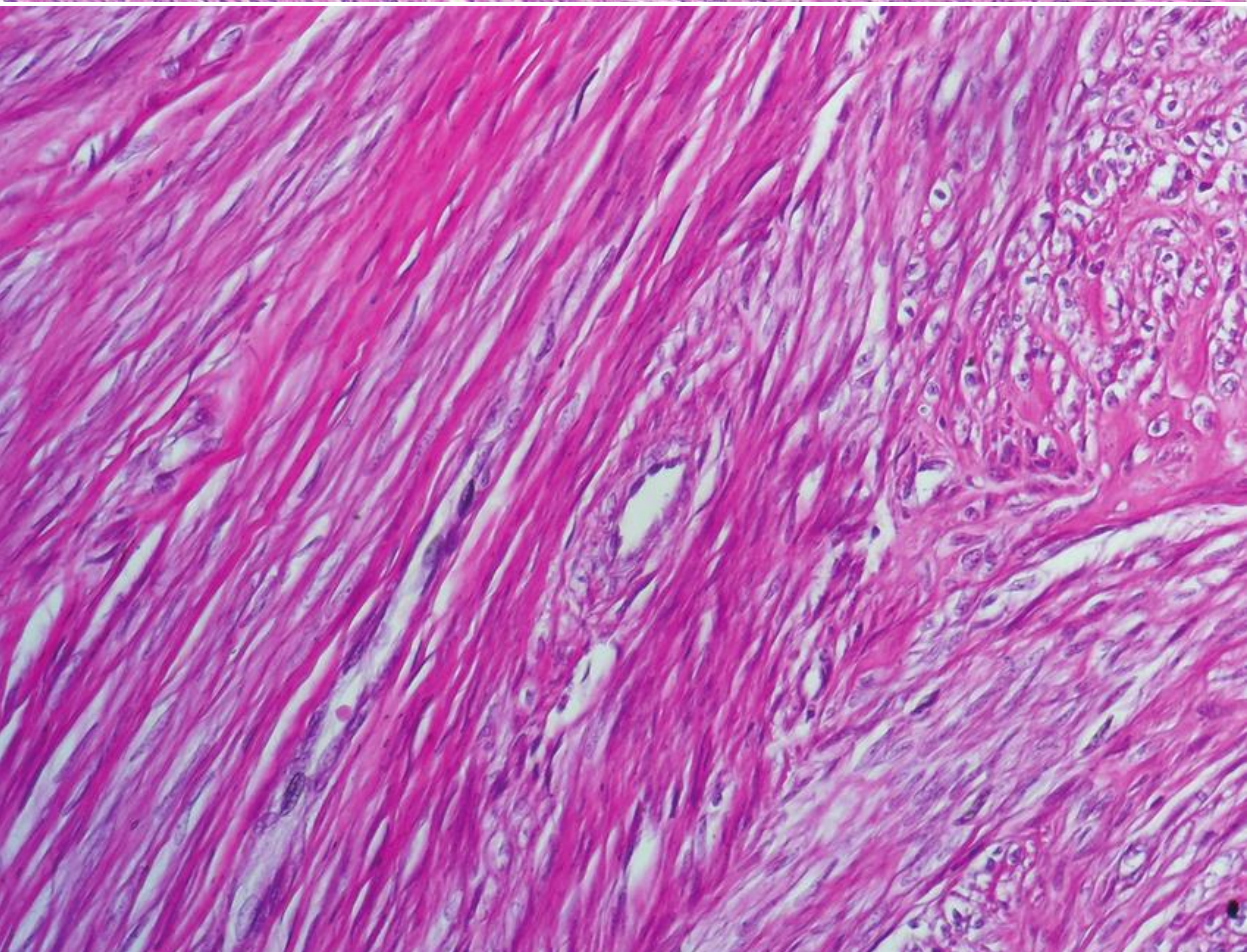
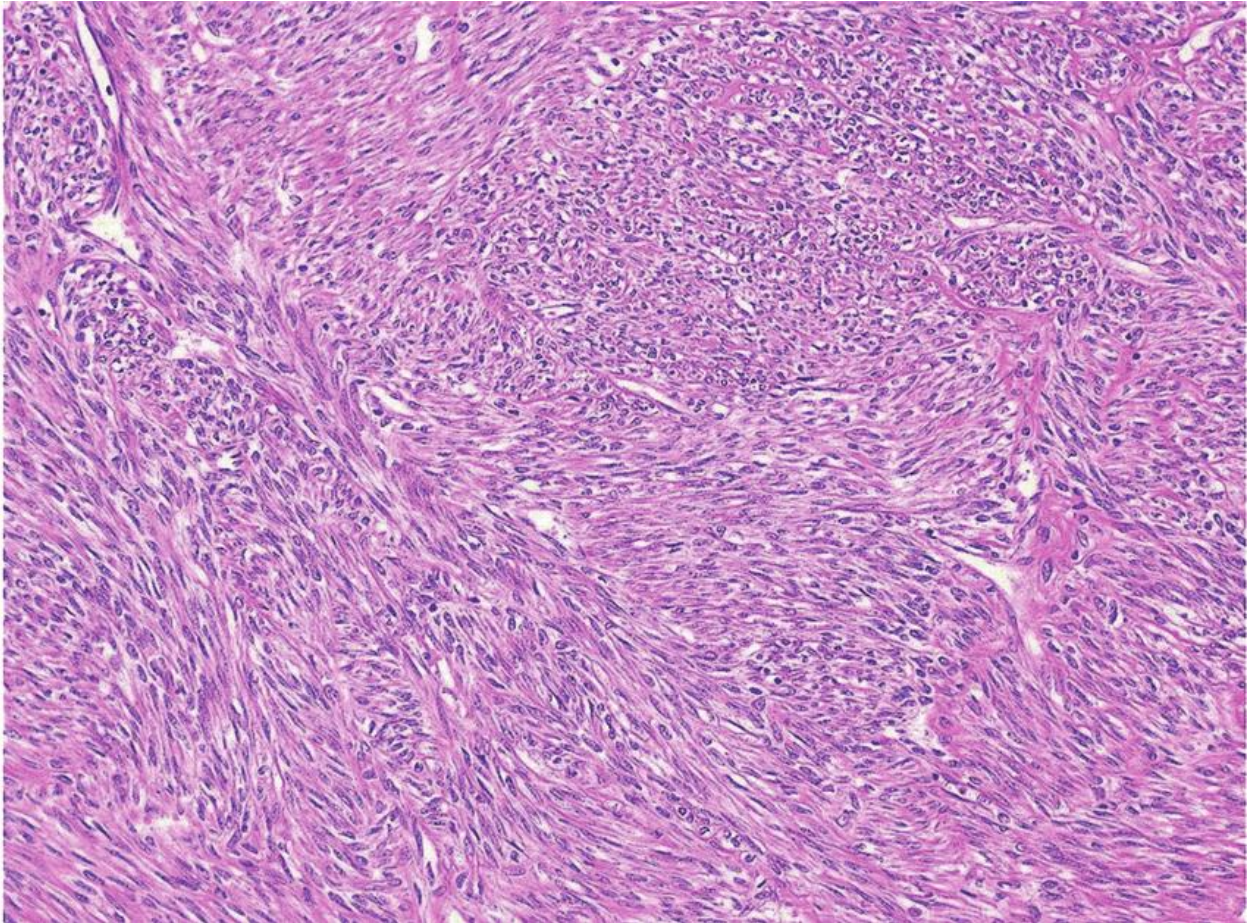


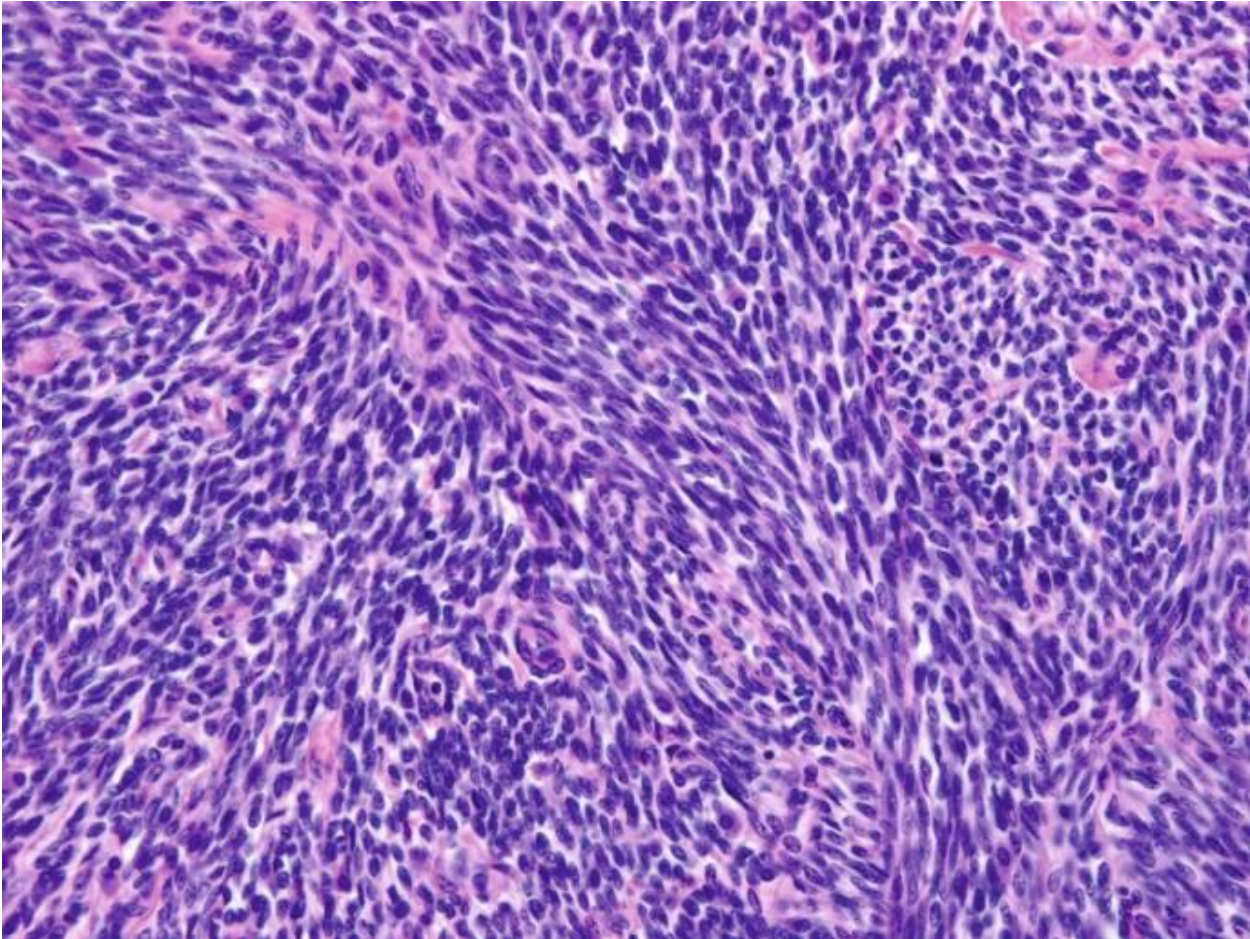
Depending on their location, fibroids are classified into:

- **Intramural fibroids** – located within the myometrium
- **Submucosal fibroids** – protruding into the uterine cavity
- **Subserosal fibroids** – projecting outward from the uterine surface

Degenerative changes such as hyaline degeneration, calcification, cystic degeneration, and necrosis may occur in large fibroids.

Microscopic (Histological) Morphology. Histologically, uterine fibroids consist of **bundles of smooth muscle cells arranged in intersecting fascicles**. These cells are elongated with cigar-shaped nuclei and eosinophilic cytoplasm. The cells are typically uniform and show minimal mitotic activity, which reflects the benign nature of the tumor.





Key microscopic features include:

- Interlacing bundles of spindle-shaped smooth muscle cells
- Abundant extracellular matrix and collagen fibers
- Low mitotic activity
- Absence of cellular atypia in most cases

Some fibroids may show variants such as cellular leiomyoma, atypical (bizarre) leiomyoma, or mitotically active leiomyoma.

CONCLUSION

Uterine fibroids are benign tumors of the uterine smooth muscle that occur frequently in women of reproductive age. Their etiology is multifactorial, involving hormonal, genetic, environmental, and growth factor–related mechanisms. Pathomorphologically, fibroids are characterized by well-circumscribed nodules composed of smooth muscle cells arranged in a typical whorled pattern with varying amounts of fibrous tissue. A thorough understanding of the etiological factors and morphological characteristics of uterine fibroids is essential for accurate diagnosis, clinical management, and the development of more effective therapeutic approaches.

REFERENCES

1. Simon S. *Uterine fibroids: A comprehensive overview of pathophysiology, diagnosis and management*. Gynecol Reprod Endocrinol. 2025.
2. Yang Q., et al. *Uterine Fibroids Initiation and Pathogenesis*. Endocrine Reviews, 2022.
3. Libre Pathology. *Uterine Leiomyoma Histopathology*.
4. ObgynKey. *Pathogenesis and Histopathology of Fibroids*.
5. Wikipedia. *Uterine Fibroid*.