

Case Report

Paraurethral Leiomyoma: A Case Report

Patou Tantbirojn MD*, Lalana Sansopha MD*,
Voranut Thanakit MD*, Nakarin Sirisubya MD**

* Department of Pathology, Faculty of Medicine, Chulalongkorn University

** Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University

A paraurethral leiomyoma is a rare benign hormone-dependent tumor of mesenchymal origin. A 43-year-old woman presented with a palpable mass near the urethral opening with no abnormal urinary symptom. Simple excision was performed. Histopathological diagnosis was paraurethral leiomyoma with confirmation by immunohistochemical study. Further hormonal study of the tumor yielded positive estrogen and progesterone receptor expression, suggesting conservative treatment with gonadotropin-releasing hormone (GnRH) agonist or antagonist may have a role as an alternative treatment in an inoperable case.

Keywords: Paraurethral leiomyoma, Estrogen receptor, Progesterone receptor

J Med Assoc Thai 2006; 89 (4): 545-9

Full text. e-Journal: <http://www.medassocthai.org/journal>

Paraurethral leiomyoma is a rare benign hormone-dependent tumor of mesenchymal origin. Less than 10 cases of true paraurethral leiomyomas have been reported in the literature⁽¹⁻⁸⁾. The etiology is not known. Most of the reported cases occur in women, thus the pathogenesis may be associated with the ovarian hormone. Most paraurethral leiomyomas cannot be diagnosed clinically but only on histological examination. A case of female paraurethral leiomyoma is presented here with the results of immunohistochemical analysis.

Case Report

A 43-year-old married woman, gravida 0, with regular menstrual cycle, visited the gynecologic department for pelvic examination and pap smear check up. She complained about a palpable mass near the urethral opening for 2 years with no abnormal urinary symptom. The patient had no history of illness involving the urinary tract.

Physical examination revealed a nontender mass, 2 cm in diameter, with a smooth surface and was located above the urethral meatus, just beneath the crus of clitoris. Vagina, cervix, and both adnexa are

normal. The uterus was the 10-week size with nodular surface. Transvaginal ultrasonography demonstrated an intramural myoma in the anterior uterine wall. Clinical impression concluded myoma uteri and paraurethral mass. Hysterectomy was recommended due to hypermenorrhea and anemia. The operation was postponed for four months due to the patient's personal problems. Iron supplement and supportive treatment were administered and the patient was referred to a urologist for further investigation. Voiding cystourethrography (VCUG) revealed minimal angulation of the urethra with no fistula. Cystoscopy showed normal bladder mucosa with suspected paraurethral cyst.

Cystoscopy prior to the mass excision, displayed narrow urethral opening with pressure effect from superior of the distal urethra. A small vertical incision was made above the urethral meatus. The mass, which was sharply dissected, was easily enucleated. Bleeding points were sutured and rechecked with cystoscope. No postoperative complication was observed.

Gross examination revealed a previously bisected pale brown lobulated mass with rubbery consistency, measuring 2.5 x 2 x 1.5 cm. Serial sections showed homogenous pale brown cut surface (Fig. 1). Microscopic examination displayed a well-circumscribed mass composed of proliferative tumor cells. They were arranged in interlacing fascicles of uniform

Correspondence to : Tantbirojn P, Department of Pathology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand. Phone: 0-2256-4235, Fax: 0-2652-4208, E-mail: two_devil@hotmail.com



Fig. 1 Gross finding reveals a lobulated mass with homogeneous pale brown cut surface

spindle cells with eosinophilic cytoplasm and elongated, blunt-ended nuclei. Mitotic activity was not detected (Fig. 2). The tumor was histopathologically diagnosed as a paraurethral leiomyoma and confirmed by immunohistochemistry, consisting of positive staining for desmin, smooth muscle actin, and specific muscle antigen (Fig. 3). Further hormonal study was performed, showing positive staining for estrogen receptor (ER) and progesterone receptor (PR) (Fig. 4).

The transabdominal hysterectomy (TAH) operation was performed four months later. The operative findings yielded a uterus 14 x 11 x 9.5 cm with an intramural leiomyoma 9.5 x 8 x 8 cm at the anterior wall and a small subserous leiomyoma, 1.5 cm in diameter, at the posterior wall (Fig. 5). The myoma was positive stained for both ER and PR.

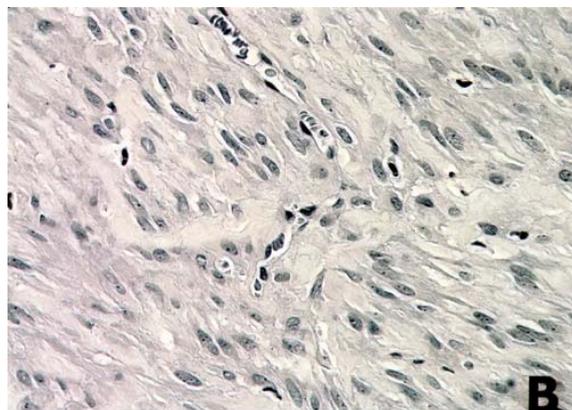
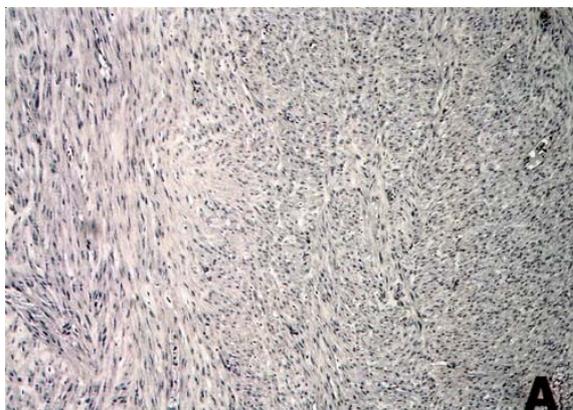


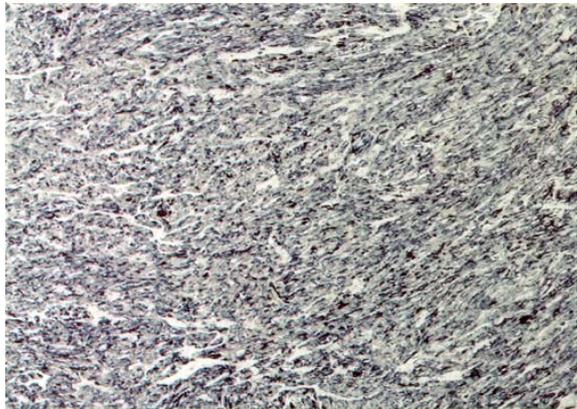
Fig. 2 Microscopic examination displays proliferative tumor cells arranged in interlacing fascicles of uniform spindle cells with eosinophilic cytoplasm and elongated, blunt-ended nuclei (Hematoxylin-eosin stain, original magnification A. x 100 and B. x 400)

The patient had no immediate post operative complication and was doing well on the 6 month follow up visit.

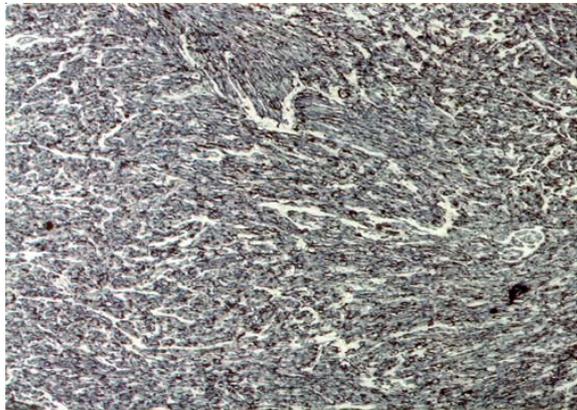
Discussion

The most common leiomyoma in female genitalia is the uterine leiomyoma. Paraurethral leiomyoma is a rare condition. Uterine leiomyoma associated with the paraurethral leiomyoma is not commonly reported. The majority of leiomyoma occurs during the reproductive period and regress after menopause, indicating ovarian steroid-dependent growth potential. The most important aspect of the etiology remains unknown. One of the proposed theories is that the estrogen and progesterone are generally recognized as promoters of tumor growth. The hypothesis states that increased levels of estrogen and progesterone result in an increased mitotic rate that may contribute to myoma formation by increasing the likelihood of somatic mutations⁽⁹⁾.

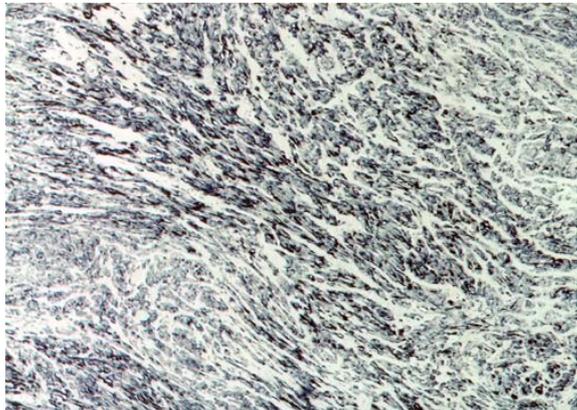
The origin of the paraurethral leiomyoma, unlike the vaginal leiomyoma, is not clearly identified and not directly associated with the mullerian tract. Development of the urinary and reproductive systems are closely associated. Both systems are developed from two longitudinal ridges of mesoderm, the urogenital ridges. In terms of the urinary system development, the kidney and the ureter develop from intermediate mesoderm, while the bladder and the urethra develop from the urogenital sinus. As the urinary system develops in the urogenital ridge, it has three sets of excretory organs - the pronephros, mesonephron, and metanephros. The pronephros forms first and



A



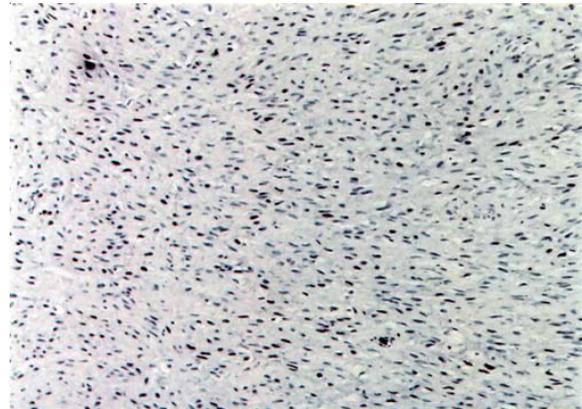
B



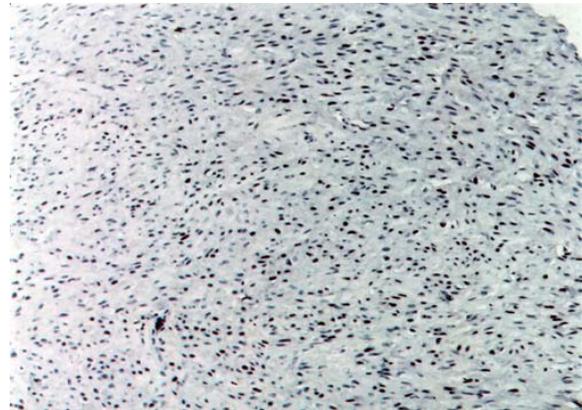
C

Fig. 3 Immunohistochemical study reveals positive staining in tumor cells for A) desmin, B) smooth muscle actin, and C) specific muscle antigen

quickly disappears. The mesonephros develops and disappears with the exception of its duct, the mesonephric duct, which will form the male reproductive duct system. The metanephros is the final excretory



A



B

Fig. 4 Hormonal study reveals positive staining for A) estrogen receptor and B) progesterone receptor

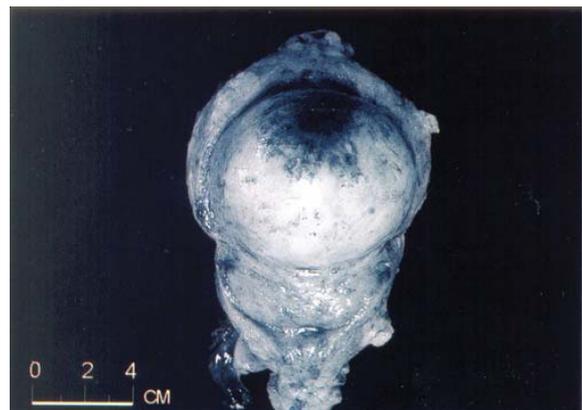


Fig. 5 Uterine leiomyoma

organ and becomes the permanent kidney. The metanephros develops from two sources, the ureteric bud, which is a diverticulum from the mesonephric duct and the metanephrogenic blastema, which is a mass of

mesoderm that condenses around the ureteric bud. The ureteric bud further differentiates into the ureter, urinary pelvis, calyces and collecting tubules. The metanephrogenic blastema differentiates into nephron units. During development, an urorectal septum forms which separates the cloaca into an anal canal and an urogenital sinus. The urogenital sinus and the allantois enlarge to form the urinary bladder. The distal ends of the mesonephric ducts become incorporated into the urinary bladder. The urogenital sinus then has three parts: the urinary bladder; the pelvic portion of the urogenital sinus which becomes the proximal urethra in the female; and the phallic portion of the urogenital sinus which becomes the vestibule, part of the urethra, and vagina in the female. The connective tissue and smooth muscle of the urethra is derived from the adjacent splanchnic mesenchyme.

Normal development of the female reproductive tract involves a series of complex interactions that lead to the differentiation of the paramesonephric ducts (mullerian ducts) and urogenital sinus. The mullerian ducts are derived from the mesoderm, while the urogenital sinus is of endodermal origin. The reproductive system can be divided into the gonads, the internal duct system and the external genitalia. The gonads develop from coelomic epithelium, the mesoderm of the urogenital ridge, and primordial germ cells that enter this region of the embryo, forming the primitive sex cords. In the absence of the Y chromosome, the primary sex cords degenerate and a new set of sex cords develop called the secondary or cortical cords which will develop into the ovaries. Two pairs of genital ducts develop in both sexes: the mesonephric (wolffian) ducts which remain as remnants of the mesonephric kidney; and the paramesonephric (mullerian) ducts which form on the lateral wall of the urogenital ridge, next to the mesonephric ducts. The paramesonephric ducts maintain an opening with the intraembryonic coelom cranially. The caudal ends of paramesonephric ducts cross the mesonephric ducts and fuse to form a uterovaginal canal. In female embryos, mesonephric ducts regress and paramesonephric ducts develop into uterine tubes, uterus, and upper 1/3 of the vagina. The uterovaginal canal will grow toward the urogenital sinus to contact its posterior wall and develops a pair of sinovaginal bulbs that are of endodermal origin develop. These sinovaginal bulbs will form the lower 2/3 of the vagina. The urogenital sinus caudal to the vaginal opening becomes the vestibule. Development of the external genitalia starts from the mesoderm lateral to the cloacal membrane proliferates and then

forms the cloacal folds, which become urethral (urogenital) folds. The urethral folds in the anterior region where they join rapidly enlarge and become the genital tubercle. Lateral to these folds a second set of swelling appear and they are called the labio-scrotal swellings. Without androgen, the genital tubercle remains small and becomes the clitoris, the urethral folds remain separated as the labia minora, and the unfused genital swellings become the labia majora^(10,11).

As previously reviewed for the development of both urinary and reproductive system, the origin of the uterine leiomyoma is most likely from the mullerian duct, while the paraurethral leiomyoma may originate from the surrounding mesenchyme of the urogenital sinus. However, further molecular study may resolve the definite origin of this tumor.

Expression of estrogen and progesterone receptors is detected throughout the female reproductive organ as well as lower urinary tract. Estrogen receptors were consistently detected in the squamous epithelia and were consistently absent in the urothelial tissues of the lower urinary tract of all women irrespective of estrogen status. Progesterone receptor expression was more variable, being mostly subepithelial, and significantly lower in postmenopausal women⁽¹²⁾.

Immunohistochemical analysis in one reported case of paraurethral leiomyoma⁽²⁾ yields positive staining for both estrogen and progesterone receptor as in this case. These results may indicate an important role for estrogen and progesterone in the promotion of leiomyoma growth. However, further study with a larger population is required to ascertain the conclusion.

The paraurethral leiomyomas are often asymptomatic, but can cause dysuria, urinary frequency, urinary retention, and dyspareunia^(1,4). Simple excision treatment is usually adequate⁽¹⁻⁸⁾. As there is estrogen receptor expression in the tumor, the conservative treatment with long acting gonadotropin-releasing hormone (GnRH) agonist or GnRH antagonist may have a role as an alternative treatment. This is only true for the case that pathological diagnosis has already been established by biopsy and may be applied to pre-operative tumor size reduction, incomplete excision, and inoperable case due to unstable clinical status.

References

1. Schenone M, Giberti C. Paraurethral leiomyoma. *Arch Ital Urol Androl* 2003; 75: 161-3.
2. Kurokawa S, Kojima Y, Tozawa K, Hayashi Y, Sasaki S, Kohri K. Female paraurethral leiomyoma: immunohistochemical approach to the relationship

- between leiomyoma and ovarian hormones. J Urol 2002; 167: 1403-4.
3. Di Cello V, Saltutti C, Mincione GP, Rovereto B, Natali A, Durval A. Paraurethral leiomyoma in women. Eur Urol 1988; 15: 290-3.
 4. Castle WN, McLaughlin WL. Paraurethral vaginal leiomyoma. Urology 1987; 30: 70-2.
 5. Nagai N, Katayama Y, Iguchi M, Esa A. A case of urinary retention due to a female paraurethral leiomyoma. Hinyokika Kyo 1988; 34: 696-700.
 6. Matsumiya K, Yamaguchi S, Osafune M, Kasai M. Paraurethral leiomyoma in a female: report of a case. Hinyokika Kyo 1988; 34: 181-3.
 7. Ogawa O, Yoshimura N, Nishimura K, Nakagawa T. A case report of paraurethral leiomyoma in a female. Hinyokika Kyo 1984; 30: 1867-72.
 8. Cattolica EV, Klein R, Knigge W. Paraurethral leiomyoma-an imitator. Urology 1976; 8: 605-7.
 9. Flake GP, Andersen J, Dixon D. Etiology and pathogenesis of uterine leiomyomas: a review. Environ Health Perspect 2003; 111: 1037-54.
 10. Anderson JR, Genadry. Anatomy and embryology. In: Berek JS, editor. Novak's gynecology. 13th ed. Philadelphia: Lippincott Williams & Wilkins; 2002: 63-121.
 11. Moore KL. The urogenital system. In: Moore KL, editor. The developing human. 4th ed. Philadelphia: WB Saunders; 1988: 246-85.
 12. Blakeman PJ, Hilton P, Bulmer JN. Oestrogen and progesterone receptor expression in the female lower urinary tract, with reference to oestrogen status. BJU Int 2000; 86: 32-8.

เนื้องอกกล้ามเนื้อเรียบบริเวณรอบรูเปิดท่อปัสสาวะ: รายงานผู้ป่วย 1 ราย

พญ. ตัณฑิไพโรจน์, ลลนา แสนโสภาก, วรณัฐ ธนากิจ, นครินทร์ ศิริทรัพย์

โรคเนื้องอกกล้ามเนื้อเรียบบริเวณรอบรูเปิดท่อปัสสาวะ (Paraurethral leiomyoma) เป็นเนื้องอกที่มีความสัมพันธ์กับฮอร์โมนที่พบได้น้อยมาก ผู้เขียนได้รายงานเนื้องอกนี้ในผู้ป่วยหญิงไทยอายุ 43 ปีที่มีก้อนบริเวณใกล้รูเปิดท่อปัสสาวะ โดยที่ไม่มีอาการผิดปกติของระบบทางเดินปัสสาวะ ผู้ป่วยได้รับการรักษาโดยการผ่าตัด การวินิจฉัยโรคนี้ได้จากการตรวจทางพยาธิวิทยาและย้อมพิเศษด้วยวิธีทางอิมมูโนวิทยา ผลประเมินของภาวะฮอร์โมนในเนื้องอกพบมีการแสดงของเอสโตรเจนและโปรเจสเตอโรนร่วมด้วย ซึ่งการใช้กลุ่มยาต้าน gonadotropin-releasing hormone (GnRH) อาจมีบทบาทในการเป็นแนวทางรักษาทางเลือกในผู้ป่วยที่ไม่สามารถผ่าตัดได้