Sonographic Diagnosis of Extraperitoneal Round Ligament Leiomyoma in Inguinal Area

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Abstract: Leiomyoma, commonly known as fibroids, is a common female disease. Leiomyoma of the round ligament of the uterus is rare. Extraperitoneal leiomyoma of the round ligament can present as inguinal and vulvar mass mimicking an incarcerated hernia, lymph node, or lipomas. We are presenting a rare case of a 53-year-old female patient who was admitted to the hospital with a right inguinal mass. Our patient underwent surgery, and a leiomyoma of the round ligament was found. Before surgery, sonography and computed tomography (CT) will be helpful in the diagnosis of extraperitoneal leiomyoma of the round ligament.

Key words: Round ligament; Leiomyomas; Sonographic; Inguinal area tumor

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Tumors of the round ligament of the uterus are rare. Leiomyomas, commonly known as fibroids, are the most common tumors of the round ligament of the uterus. In most cases, they present as inguinal masses in women of reproductive age [1]. They can be mistaken for hernias or lymph nodes. Aside from inguinal locations, abdominal and vulvar locations have been reported. After surgical excision, the histopathological examination of the specimen provides the final diagnosis [2]. Imaging diagnosis is the modality of choice in patients presenting with a palpable mass in the inguinal region. We report a case of a round ligament leiomyoma presenting as an inguinal mass with sonography and CT.

Case Report

A 53-year-old woman presented with a right inguinal mass (Fig. 1A and B). The mass was noticed around six months ago and has been intermittently painful and discomforting. It was obvious after standing and activity. The patient stated that the mass has grown in size recently. On physical exam, the mass was round, firm, and slightly tender, measuring around 3-4 cm and cable-like. The mass was painless with palpation. A bulge was visible in the right inguinal area. The patient had also undergone a caesarean section over 28 years ago and a hysterectomy for fibroids over 10 years ago. She denied abdominal pain, abdominal distension, and anal discharge, denied nausea and vomiting, normal spirit, diet, urine, and feces. She had no past medical history, and no long-term estrogen use.

An IU 22 ultrasound scanner (Philips Ultrasound) equipped with a 9–3-MHz linear-array transducer was used for imaging. Sonography of the inguinal region using the linear-array transducer showed a fusiform hypoechoic mass measuring 3×4 cm. A stalk-like structure was seen in the cranial aspect of the mass (Fig. 2A). No appreciable peristalsis was seen, and the mass did not change during the Valsalva maneuver. Color Doppler sonography revealed patchy blood flow signals in the mass (Fig. 2B). Plain CT scan was done previously in other hospital, and revealed a well-circumscribed lesion in the right inguinal area (Fig. 3).

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This did not communicate with bowel or other structures. No additional masses were noted in the remainder of the pelvis or abdomen.

At surgery, a fusiform tumor structure with a pedunculate was found to be attached to the round ligament. There was no hernia of the bowel. Excision of the tumor found in the round ligament was performed. Histopathologic examination revealed a tumor structure that was a spindle cell tumor, the specimen showing intersecting fascicles of smooth muscle cells separated by connective tissue (Fig. 4A and B). The findings were consistent with the diagnosis of leiomyoma. Immunohistochemical stain for desmin and SMA later confirmed the diagnosis (Fig. 4C and D).

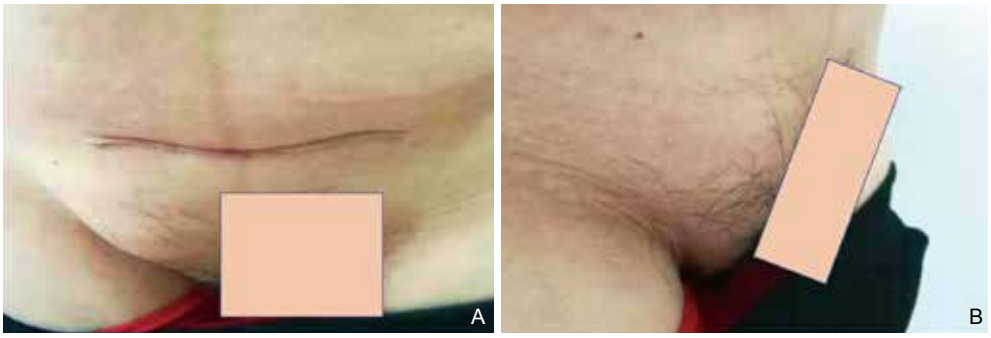

Figure 1 Appearance of right inguinal mass from frontal view (A) and profile view (B).

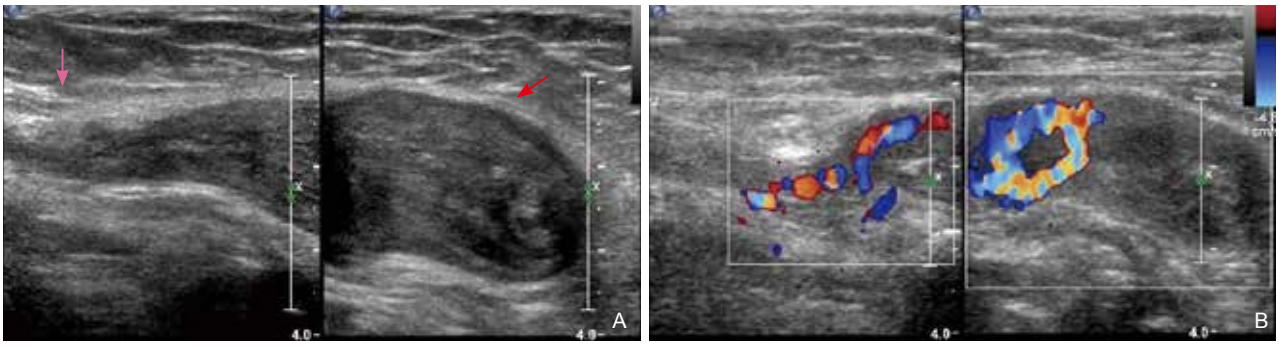

Figure 2 (A) Sagittal sonogram of the right inguinal region shows a fusiform hypoechoic mass (red arrow) with stalk-like structure (pink arrow) at the cranial pole of the mass; (B) Color Doppler sonogram shows scattered blood flow signals in the mass.

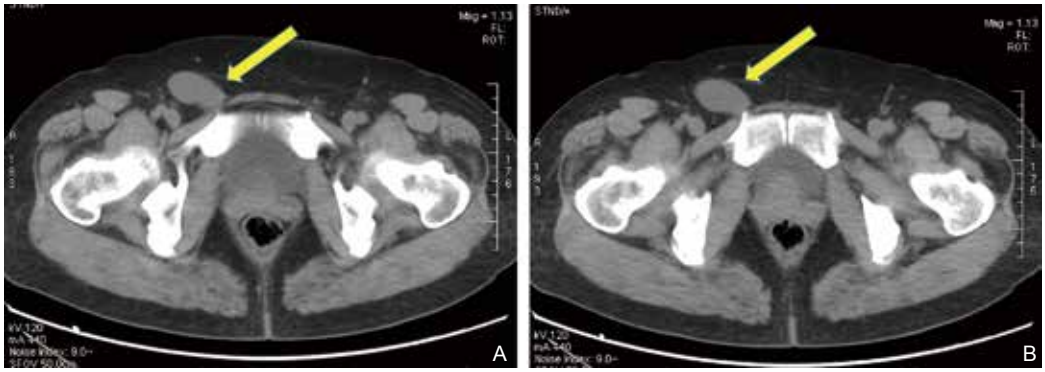

Figure 3 Axial CT demonstrates a well-circumscribed lesion, homogeneous mass in the proximal portion of the right inguinal canal (arrows).

Discussion

The round ligament, the embryological equivalent of the gubernaculum testis in females, is mainly composed of connective tissue, smooth muscle fibers, vessels, and nerves with a mesothelial coating. It extends from the uterus to the labia majora, passing through the inguinal canal [3]. Round ligament tumors are rare. Leiomyoma is one of the most common types of round ligament tumor. Round ligament leiomyomas, are more common on the right side, occur mainly in premenopausal women, and are most often asymptomatic [4]. We report a rare case of extraperitoneal round ligament leiomyoma that presented as an incarcerated inguinal hernia.

Round ligament lesions are frequently misdiagnosed,

as more common pathologic conditions include hernia, enlarged lymph nodes, parasitic infection, extraperitoneal endometriosis, varix, ganglion cyst, and benign and malignant soft tissue tumors such as lymphoma, leiomyoma, lipoma, and round ligament lesions [5,6]. In the past, a palpable inguinal mass was removed via surgery without an imaging study. Currently, however, imaging examination is the modality of choice for evaluation of this type of mass. Therefore, it is important for radiologists to be aware of the imaging findings of the various conditions that affect the inguinal region [7].

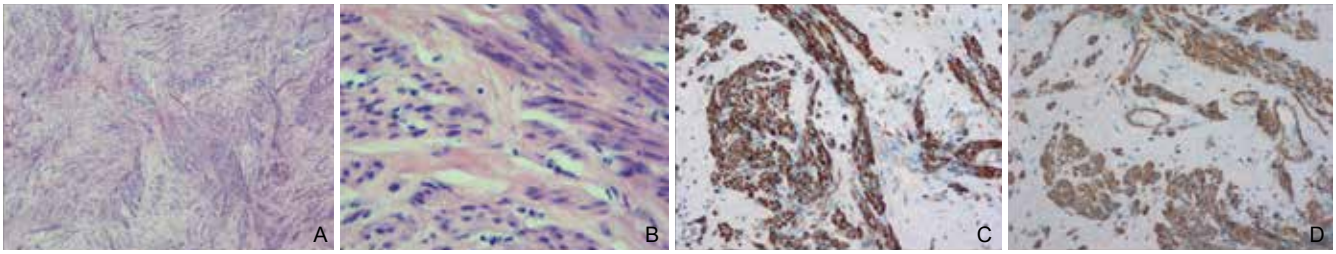

Figure 4 Histopathology showing whorls of smooth muscle fibres under 10× (A) and 40× (B) microscope. Immunohistochemical stain for smooth muscle desmin (C) and SMA (D).

In this case, on ultrasound, round ligament leiomyomas present as well-defined hypoechoic masses. They may present as homogenous or heterogeneous masses and may have a whorled appearance. The stalk-like structure of the mass is a sonography characteristic (Fig. 2A). Moreover, the mass exhibits absence of peristalsis during real-time sonography. Color Doppler ultrasound can show scattered blood flow signals in the mass (Fig. 2B) [8]. On CT, round ligament leiomyoma appears as a well-circumscribed lesion in the inguinal area and may be accompanied by expansion of the inguinal canal (Fig. 3). There were reports that round ligament leiomyomas appear with bright and heterogeneous enhancement, an appearance typical of but not specific to leiomyomas under contrast-enhanced CT scan [9]. Definitive diagnosis and treatment of extraperitoneal leiomyoma or round leiomyomas are obtained through surgical excision.

For some inguinal masses, ultrasound has a significant diagnostic advantage such as round ligament varicosities. Gray-scale sonography showed a mass composed of multiple, echo-free, tubular channels. The color Doppler sonography confirmed hypervascular and abundant venous flow consistent of a mass. The spectrum Doppler showed the venous blood flow spectrum in the varicose vessels [10]. Solid masses, such as lipoma, can be diagnosed by a variety of imaging techniques. The ultrasound appearance of a lipoma is that of a hyperechoic mass with a lack of color flow within the lipomatous masses. Compared with ultrasonography, MRI can determine the fatty nature of the mass by lipid suppression sequence [11]. In some cases, ultrasonography or CT cannot differentiate a leiomyoma mass of similar density such as hematoma, lymphoma, or inguinal endometriosis. Detailed medical history can also help aid diagnosis. It indicates the possibility of hematoma after trauma or invasive medical operation. Inguinal endometriosis presents as periodic menstrual pain with an inguinal mass, and is important in distinguishing this condition from other inguinal pathology. When imaging diagnosis is ambiguous, fine needle aspiration biopsy has also been shown to aid in the diagnosis before surgery [12].

Conclusion

Leiomyomas of the round ligament can be a possible but rare etiology of the inguinal mass and can be mistaken for an inguinal hernia or lymphadenopathy. Firstly, sonography is a preferred imaging method with advantages of non-ionizing radiation, safety, and convenience. If not possible, a CT and MRI scan can assist when there is a diagnostic dilemma, but eventually, surgical exploration provides therapy and pathological examination provides a clear diagnosis.

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Conflicts of Interest

The authors declare that they have no competing interests.

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