CASE REPORT

Intratendinous ganglion cyst of the semimembranosus tendon

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ABSTRACT. Intratendinous ganglion cyst is a very rare lesion with an unknown aetiology that originates within the tendon. We encountered a case of 43-year-old woman who complained of a palpable, non-tender mass in the thigh with increasing swelling. An intratendinous ganglion cyst in the semimembranosus tendon of the lower extremity was diagnosed and located by ultrasound and MRI. Nine months after a surgical excision, there were recurrent ganglion cysts along the semimembranosus tendon. We describe this case with a review of the relevant literature.

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A ganglion cyst is a common tumour-like lesion arising from various soft tissues that is generated by mucoid degeneration of the joint capsule, tendon or tendon sheath [1]. It can occur in any part of the extremities including the hand, wrist and foot. However, an intratendinous ganglion cyst is an uncommon lesion that originates within the tendon substance itself and causes soft-tissue swelling [2, 3]. As reported previously, intratendinous ganglion cysts are difficult to diagnose clinically before surgery and to excise completely [4]. For the most part, symptoms are mild in patients with pain and nerve compression [1, 5]. Ultrasound (US) and MRI can differentiate a ganglion cyst from other soft-tissue tumours and tumour-like lesions, and provide excellent information on the location of an intratendinous lesion [1, 2, 6]. To our knowledge, this is the first case report of an intratendinous ganglion cyst arising from the semimembranosus tendon itself.

Case report

A 43-year-old woman presented with a 1 month history of a palpable and painless mass in the right posteromedial thigh area with increasing swelling. She had no history of injury or inflammation in that area and was otherwise healthy.

The physical examination revealed an approximately 10 × 2 cm mass from the right mid-thigh area to the right femoral condyle. The mass was firm, non-tender and non-movable. There were no functional or nerve deficits.

The radiographic findings of the femur were normal. Ultrasonography revealed a long tubular anechoic well-circumscribed cystic mass with partial internal septation that was located in the posteromedial aspect of the right

thigh (Figure 1). A Doppler sonographic examination showed no evidence of a vascular signal.

2 weeks later, MRI was performed using a 1.5 T scanner (Magnetom Vision Plus; Siemens, Erlangen, Germany). A well-defined, elongated tubular mass was observed within the semimembranosus tendon, measuring about 1.7 × 1.5 × 13 cm. It displayed isosignal intensity to skeletal muscle on the T_1 weighted images and high signal intensity on the T_2 weighted images. After gadolinium enhancement, the mass showed cylindrical thin peripheral wall enhancement (Figure 2).

At surgery, the mass appeared encapsulated and completely contained in the intact semimembranosus tendon. After a careful longitudinal dissection of the tendon, a transparent gelatinous fluid spilled from the mass, indicating a ganglion cyst. The remaining tendon was repaired. There was no surgical evidence of tenosynovitis and adhesion. A microscopic examination revealed the cystic mass to consist of a thick, dense fibrous wall within the skeletal muscle representing the tendon.

Figure 1. Ultrasonography of the right posterior thigh shows a large (10 × 1.7 cm) tubular well-circumscribed intramuscular anechoic mass with tapering of the distal end. This lesion has an internal thin echogenic ridge.

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(a)

(b)

(c)

Figure 2. (a) Axial T_1 weighted spin-echo image (repetition time (TR)/echo time (TE), 722/20) shows an isointense mass in relation to the signal intensity of skeletal muscle in the semimembranosus tendinous portion (arrow) at the level of the right distal posterior thigh. (b) Sagittal T_2 weighted fat-suppressed fast spin-echo image (TR/TE, 3000/99) shows a high signal intensity elongated tubular cystic mass-like lesion in the semimembranosus tendinous portion (13 cm in craniocaudal direction). (c) Gadolinium-enhanced coronal T_1 weighted fat-suppressed (TR/TE, 900/12) scan shows a thin peripheral rim-enhancing lesion within the semimembranosus tendon (arrow).

Nine months after surgery, the patient complained of a palpable mass in the incisional surgical site of her right thigh, and a follow-up CT scan was performed (Figure 3). The sagittal reformation CT scan showed a thin tubular cystic mass with a peripheral enhancing lesion in the semimembranosus tendon and another larger ($2.8 \times 1.9 \times 2.8$ cm) ovoid cystic mass abutting the semimembranosus tendon. These lesions were considered to be recurrent ganglion cysts due to intra-operative leakage and the incomplete resection of the ganglion cyst.

Discussion

Ganglion cysts are cystic, common tumour-like lesions in the soft tissues adjacent to joint capsules or tendon sheaths. They can occur within muscles, menisci and tendons, and are frequently found in the hand, wrist and foot.

Traditionally, they have been classified according to their site of origin: the tendon sheath, joint, bone or soft tissue. Although ganglion cysts most commonly arise from the tendon sheaths, the incidence of an intratendinous ganglion cyst that originates within the tendon substance itself is relatively rare [2, 3].

After Lecne [7] first reported an intratendinous ganglion cyst within the common extensor tendon to the middle finger over the dorsum of the hand, several references to intratendinous ganglion cysts have appeared in the literature. Most of these concerned cysts arising from the extensor tendons of the wrist and hand [3, 4, 8, 9].

Intratendinous ganglion cysts of the lower extremity are even more uncommon and have been reported in the

tendon of peroneus longus below the knee [10], the quadriceps femoris tendon [11], the peroneus tertius tendon at the dorsolateral aspect of the right foot [12] and the extensor digitorum longus tendon close to knee [1]. To our knowledge, this is the first report of an intratendinous ganglion cyst arising from the semimembranosus tendon itself.

The aetiology of intratendinous ganglion cysts is unclear. However, recurrent injury to the tendon with subsequent cystic degeneration is a possible cause of an intratendinous ganglion cyst because tenosynovitis or associated tendon tears are often present around the ganglion cyst [13]. A congenital anomaly may be responsible in patients with no history of trauma [14]. In our case, the patient had no history of injury or inflammation.

MRI and US are highly sensitive, specific and effective methods for delineating the nature of cysts, including their size, location and relationship to the surrounding structures [1], but MRI provides a better anatomical overview.

On MRI, a ganglion cyst appears as a well-defined, lobulated mass that is commonly located adjacent to a joint or tendon sheath, with a simple or complex fluid-like signal. Typically, the lesion exhibits thin rim enhancement on the gadolinium-enhanced T_1 weighted images. A differential diagnosis based on MRI may include tenosynovitis, tendon tear, bursitis, abscess, pigmented villonodular synovitis, myxoma, nerve sheath tumour and synovial sarcoma [1, 2, 6]. However, the findings of a lobulated cystic mass occupying the characteristic location within a tendon and displaying thin rim enhancement should suggest an intratendinous ganglion cyst [2].

Ganglion cysts of the lower extremity can recur in about 10% of cases after surgical excision, usually because ganglion cysts have been incompletely removed [15, 16]. Recurrence after surgery for partial excision of an intratendinous ganglion cyst has been reported [9]. In our patient, 9 months after surgery at the follow-up CT, recurrent ganglion cysts were found along the semimembranosus tendon due to intraoperative leakage and incomplete excision of the intratendinous ganglion cyst.

In conclusion, intratendinous ganglion cyst is a relatively uncommon lesion that originates within the tendon substance itself. We have presented the case report of an intratendinous ganglion cyst arising from the semimembranosus tendon with findings using US and MRI.

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Figure 3. Nine months after surgery, the follow-up CT scan of the right thigh with enhancement (sagittal reformation) shows a thin tubular (arrowhead) and another larger (arrow, $2.8 \times 1.9 \times 2.8$ cm) ovoid cystic mass with peripheral rim enhancement along the right semimembranosus tendon. These lesions are probably recurrent ganglion cysts due to post-operative leakage and partial resection.

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