

Muscle herniation of the extremities: Two case report

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ABSTRACT

Muscle herniation of the extremity is a rare clinical entity. Here, we report two patients with muscle herniation at different locations. The first case is a 52-year-old man complained of pain, a local mass, and paresthesia on his right cruris, especially occurring during prolonged exercise. He had medical history including accidentally cut his cruris with the saw two years ago, fortunately he had no tibial fracture. A symptomatic posttraumatic herniation of peroneus longus muscle was diagnosed. The fascial defect was treated surgically. The second case is a 14-year-old child. He had suffered a Type 1 open radius ulna shaft fracture ten years ago. An asymptomatic posttraumatic muscle herniation at the flexor muscles of the forearm was diagnosed. His medical history included the closed reduction and cast application for fractures and close follow-up. As he had no pain or dysfunction and positive findings in ultrasonography and magnetic resonance imaging at the presentation, no treatment was applied. Muscle herniation of the extremity is a rare clinical entity. It was asymptomatic, so it needs no treatment. If it were symptomatic, a longitudinal fasciotomy may be a choice for surgical treatment.

KEY WORDS: Muscle Herniation; Extremity; Longitudinal Fasciotomy

INTRODUCTION

Muscle herniation of the extremities is a rare clinical entity. It is frequently misdiagnosed as a soft tissue tumor, which is very dangerous since obviously, an accurate understanding of a medical condition is necessary for conducting its proper treatment [1, 2]. Muscle herniation most commonly occurs as acquired (posttraumatic or postsurgical) or congenital fascial defects. It frequently occurs in the lower extremities of young adult men. An asymptomatic muscle herniation needs no treatment. In the case of symptomatic muscle herniation, patients can experience local pain, tenderness, paresthesia and cramps in the affected limb, especially after prolonged physical exercises [1-4]. In addition, during provocative maneuvers such as flexion, extension, squatting, and standing, the muscle hernia can be detected by physical examination [1]. The MRI findings are non-specific. However, MRI can allow recognition of herniated muscles and identification of fascial defects [5-7]. Dynamic ultrasonography (USG) is more accurate than MRI [8].

The most common occurred muscle hernia at lower extremities is an anterior tibial muscle hernia [9-11]. However, a muscle herniation involving the other muscles such as gastrocnemius, peroneus longus and brevis can also occur.

For symptomatic muscle herniation, researchers describe two treatment options. The first option is conservative treatment and it includes the limitation of physical activity, the use of the compressive stockings, partial weight-bearing. The second option is surgical treatment, including fasciotomy, primary repair of defects fascia, tibial periosteal flap, patch

repair, partial muscular excision, the application of tendon weave grafts derived from palmaris longus, fascia grafts or tensor fascia lata, synthetic mesh, and acellular porcine dermal matrix [12-16]. In children, muscle herniation of the limbs rarely ever occurs. The reports concerning muscle hernia are extremely limited. Here, we aimed to report two patients with muscle herniation at different locations because of its rarity.

CASE REPORT

Case 1

The patient was a 52-year-old man and he had pain, a local mass, and paresthesia on his right cruris, especially during prolonged exercises. He had cut his cruris with a saw two years ago, however, he had no tibial fracture. Primary suturation of the wound had been performed in the emergency room. The doctor had recommended the conservative treatment, including limitation of physical activities, partial weight-bearing and wearing compression stockings.

On clinical examination, dorsiflexion of his ankle revealed some pain and muscle stiffness in his right cruris. Tinnel phenomenon was negative. Scar tissue was evident on the proximal one-third anterolateral side of the tibia. When muscles were relaxed, a soft palpable mass in the same area was detected. The patient reported the sensation of numbness on the anterolateral side of cruris. Vascular circulation was normal, and there was no muscular atrophy. A symptomatic posttraumatic muscle herniation on the right cruris involving peroneus longus muscle was diagnosed (Figure 1).



Figure 1. The posttraumatic muscle herniation on the lower limb that included peroneus longus muscle.



Figure 2. A magnetic resonance imaging scan demonstrating the fascial herniation defect in the same patient.



Figure 3. A longitudinal incision with 20 cm long above the anterolateral side of the tibia.

The USG did not reveal any signs of muscle herniation. Finally, upon the suggestion of radiologists, MRI was provided and it revealed fascial and muscular laceration, and fascial herniation defect (Figure 2). With spinal anesthesia, a longitudinal incision of approximately 20 cm was performed directly above the anterolateral side of the tibia (Figure 3). A fascial defect was observed. A compartment was opened via longitudinal fasciotomy. Scar tissues were resected and a superficial peroneal nerve was released. After washing tissues by serum physiologic, skin and fat tissue underside skin were sutured. Post-operatively, an elastic bandage was applied to cruris. Walking with partial weight-bearing was done during three weeks following the surgery. He could walk with the help of a crutch. It was no observed any complication such as wound infection or thrombosis. Three weeks after surgery, he had no pain and paresthesia on his leg and he has begun to walk without a crutch.

Case 2

The patient was a 14-year-old child. He had suffered a Type I open radius-ulna shaft fracture ten years ago. His medical history included the closed reduction and cast application for fractures and close follow-up. When he and his family arrived at our hospital, he was complaining of a local mass on his right forearm. However, he had no clinical symptoms (pain or dysfunction) were founded. An asymptomatic post traumatic muscle herniation involving the flexor muscles of the forearm were diagnosed (Figure 4). As he had no pain or dysfunction, positive findings in USG and MRI at the presentation, no treatment was needed. A close follow-up was recommended.

DISCUSSION

Muscle herniation is described as a muscle protrusion resulting from a fascia defect. They most commonly occur from acquired fascia defects due to direct or indirect trauma, fascial weakness, athletic activity, occupational injury, chronic compartment syndrome and prior fasciotomy [1, 12-17]. Because it is a rare clinical entity, reports on muscle hernia is very limited. Thus, the actual incidence of symptomatic muscle herniation remains unknown.



Figure 4. A posttraumatic muscle herniation of the upper limb, including the flexor muscles of the forearm.

Patients are usually presented with a palpable soft-tissue mass that becomes more firm and prominent after the contraction of the affected limb. Most of the masses are painless; however, in some cases, they may become painful after prolonged exercises due to focal muscle entrapment and resultant ischemia [1-4]. The presence of pain is an important indicator for treatment of symptomatic muscle herniation. In our patient, following a longitudinal fasciotomy, we observed the partial muscle necrosis possibly due to focal muscle entrapment or secondary to penetrating trauma. Subsequently, we debrided the necrotic and fibrotic tissue.

Dynamic USG and provocative maneuvers such as flexion, extension, standing, and squatting is key to the diagnosis [5-8]. Although MRI findings are non-specific, it can facilitate recognition of fascia defects and muscle herniation in the extremity. In particular, dynamic MRI and USG are more helpful than conventional MRI and USG for diagnosing herniated muscles [5-8]. In our both cases, USG did not reveal any pathological finding whileas conventional MRI showed fascial defects and muscular laceration on cruris in the case 1.

The muscle herniation is common in young adults, especially males [1-4] and it most commonly occurs in the cruris. It usually involves tibialis anterior, peroneus longus, or peroneus brevis muscles. However, gastrocnemius muscle herniation can occur. If the herniation of gastrocnemius muscle occurs near the knee, it can cause peroneal nerve compression [13, 14]. The herniation of peroneus longus muscle can also cause superficial peroneal nerve compression [14].

In case 1 with symptomatic muscle herniation on the right cruris involving peroneus longus muscle, we performed the longitudinal fasciotomy and superficial peroneal nerve decompression reported by Zadravec [14]. Three weeks after the surgery patient had not any neuropathic symptom.

The options for treatment of symptomatic muscle herniation in the limbs traditionally include fasciotomy, direct repair, periosteal patch plasty, tendon weave grafts (palmaris longus), fascia grafts (tensor fascia lata), synthetic mesh, and acellular porcine dermal matrices [12-16]. A synthetic mesh or a fascia lata graft should be considered in surgical treatment for large fascial defects [12-16]. Longitudinal fasciotomy is another option. However, primary repair can be an option for surgical treatment of small fascial defects [12-16].

The complications of longitudinal fasciotomy include dry and scaly skin, pruritus, discolored wounds, swollen limbs, tethered scars, and tethered tendons [12-16]. We only observed that the extremity with the longitudinal fasciotomy was a little bit swollen; however, our patient wasn't suffering from this.

Repairing fascial defects by using autologous materials such as a fascial graft (tensor fascia lata), a tendon weave graft, or

periosteal patch plasty, is inexpensive and efficient. For these reasons, they could be a solution for surgical treatment of muscle hernias. Post-operative rehabilitation takes more time compared to rehabilitation after a longitudinal fasciotomy [12-16].

The treatment protocol for children is the same as that for adults. If a muscle herniation is symptomatic, it requires surgical treatment; whileas asymptomatic muscle herniation on the extremities needs no treatment [2, 3, 5].

Here, we report two patients with muscle herniation at the different locations because of its rarity. The treatment modalities including longitudinal fasciotomy and superficial peroneal nerve decompression are relatively simple for surgeons to perform, and effective in decreasing symptoms. In addition, there was another case of an upper limb muscle herniation that includes the flexor muscles of the forearm. It was asymptomatic, so it needs no treatment. If it were symptomatic, a longitudinal fasciotomy would have been a good surgical treatment for him.

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