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Treatment of a symptomatic forearm Muscles Herniation with a Mesh Graft

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ABSTRACT

Symptomatic muscle herniations are an unusual cause of upper extremity pain that is rarely reported in the literature. Out of 18 reported cases of upper extremity herniations, only 3 were caused by strenuous exertion6. Dynamic ultrasound and Dynamic MRI test are the very good tool for diagnosis of muscle herniation, FNAC and biopsy are rarely needed. This article describes a successful repair of a 22yr old manual worker's ventral forearm herniation with polypropylene mesh.

Prevalence

Muscle herniation in an extremity is a well-known cause of pain, even though there have been extremely few documented cases. In a 2009 report published by the "Journal of Hand and Microsurgery," only 200 cases of herniated muscles of the extremities had been reported since the mid-1800s, and only 17 cases of muscle herniation in the upper limb have been described10.

Characteristics

A herniated muscle in the forearm can cause mild to severe localized pain, affect grip, cause nerve pain or have no physical symptoms at all. Causes of documented cases include sporting or occupational activities, or an unrelated primary medical condition. Patients usually have a swollen mass that increases in size when the affected muscle is engaged and decreases when the muscles are relaxed. One differential diagnosis for a herniated forearm muscle is a tumor. Muscle herniation in the forearm typically affects males in their adolescent or young-adult years1.

We report a case of a disappearing Forearm nodule that appeared with muscle contraction. This is characteristic of a transfascial muscle hernia. Ultrasound and MRI are the key to identifying an area of fascial alteration. Treatment alternatives of this unusual condition are discussed.

Keywords : Dynamic MRI, Flexor Carpi Radialis, Muscle herniation, Mesh Graft

Clinical case

22yr old male physical worker had injury to his right forearm hitting by bull. At that time there was no external wound except swelling over anterior aspect of left upper part of forearm. Later on he developed swelling at the site of injury, there was no neurovascular deficit distal to the injury. He had pain during daily routine activities of his manual work, specially during physical activities. Swelling increases in size during flexion of wrist and finger decreases when limb at rest.

After three month patient consulted a general surgeon for the same problem where he was investigated and aspiration biopsy and later on open biopsy was performed. Biopsy report was normal. After the removal of the stitches he again developed same swelling and had pain at the same site during manual activities.

Patient was admitted in department of Orthopedics, S.P. Medical College Bikaner, Rajasthan. On examination an old transverse scar mark of incision and tattoo mark was present on the flexor aspect of the forearm. Physical examination exhibited a soft, compressible, immovable swelling at this location that could not be palpated after pressure release.

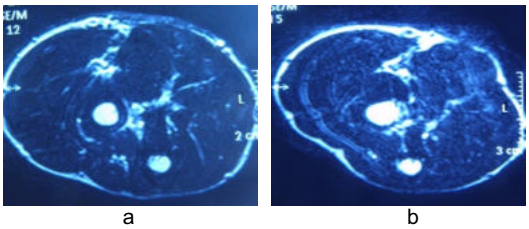
Patient was fully investigated for, digital X-ray of Forearm, An ultrasound was performed during rest and stress (dynamic Ultrasound) of this swelling shows irregularity of the fascial layer at the level of the disappearing swelling on pressure, a Flexor Carpi Radialis muscle (F.C.R) hernia was revealed (Fig.7)

MRI- was performed during rest. (28 x 6 mm lesion seen in the flexion compartment sub-cutaneous tissue). Dynamic MRI (performed during stress after the flexion at fingers and wrist) - 32 x 36 mm lesion was seen in the flexion compartment of forearm (hyper intensity in flexor carpi radialis muscle with herniation through the fascial defect.) (Fig-3,4 & 5)

Figure 1 : Limb during rest(Small swelling visible)

Figure 2 : Muscle herniation through the fascial defect (during muscle contraction)

Figure 3 : Axial T2W images of dynamic MRI (a) in neutral state and (b) wrist in flexion.Shows subtle increase in intensity in the flexar carpi radialis muscle in neutral state with loss of subcutaneous fat. In dynamic state there is protrusion of muscle through the deep fascia of forearm.



a b

Figure 4 : Axial T2W with fat suppression images of dynamic MRI shows increased in intensity of subcutaneous tissue and flexar carpi radialis which is more obvious in dynamic state and a clear defect is seen through which the flexar muscle is herniating into the subcutaneous fat plane.

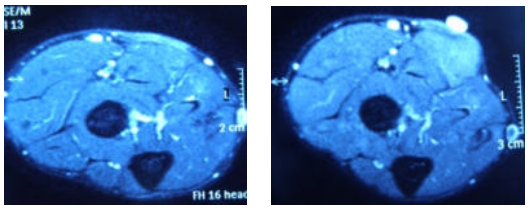


Figure 5 : a) proton density sagital image, b) T2W sagittal and c) STIR sagittal image in dynamic state shows clear defect in the deep fascia with hyperintensity in flexor carpi radialis muscle with herniation through the fascial defect.

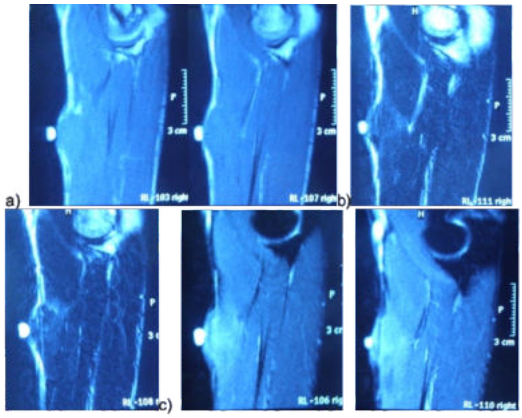
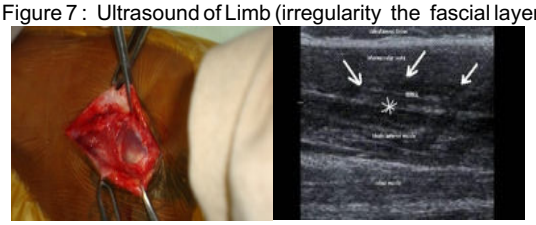


Figure 6 : Fascial defect of the fascial layer (herniated site of limb)

Figure 7 : Ultrasound of Limb (irregularity the fascial layer)



Patient was operated because of pain during hard work . During operation fascial defect was seen through which the F.C.R muscle was bulging . Scared muscle was excised and gap repaired with prolypropline mesh. Post operative period was uneventful . At six month follow up the patient was completely relieved of his symptom and was able to return to his previous occupation.

Comment

A herniated forearm muscle is a relatively rare condition in which muscle protrudes through the fascia 'the fibrous tissues that connect the muscles into the fat beneath the surface of skin,. This condition is sometimes inherited and can be present at birth. Causes include trauma, an occupational hazard or weakness in the overlying tissues. Symptoms of a herniated muscle in the forearm are, pain in that spot and tenderness after exercise or manual work .

Muscular hernias are focal protrusions of muscle tissue through fascial defects . Their origin may be either primary or secondary to blunt trauma as in physical workers 1 . When muscular hernias occur in the Fore arm , they are most common in flexor compartment upper third. However, other muscles such as the Flexor digitorum superficialis and Flexor carpi Ulnaris be affected.

Consultation is often sought to rule out a soft tissue tumor and physical examination shows a lump in the described location. The diagnosis is mainly confirmed by Dynamic ultrasound and Dynamic MRI demonstrating muscle protrusion through fascia with increasing compartment pressure. The transducer should be applied with minimum pressure because it can reduce the hernia and provide a false negative3. The ultrasound image is of a focal fascial disruption that can go unnoticed and may be recognized by the herniated portion of the muscle that has a mushroom-shaped appearance with a superficial convex contour. The hernia is usually less echogenic than the normal muscle, possibly because of anisotropy or crowding of the fibro-adipose septa. Doppler images may show an increase of vascularization through the hernia caused by this crowding phenomenon4,11,13.

Conclusion

The diagnosis of muscle hernia should be considered when a lump that becomes prominent during contraction of muscle. Dynamic ultrasound and Dynamic MRI test allows, dynamic exploration and guidance for treatment if necessary.

Asymptomatic hernias are treated conservatively. For severe pain or cosmetic reasons surgery may be contemplated6. Fasciotomy, an autologous fascia lata onlay graft, polypropylene mesh or patch grafting are treatment options. Simple fascial repair should be avoided because it may result in a compartment syndrome3

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