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SONOGRAPHIC DIAGNOSIS OF CLINICALLY UNSUSPECTED PRIMARY ANEURYSM OF THE MEDIAL MARGINAL VEIN OF THE LEFT FOOT

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ABSTRACT

Background: Distinguishing primary aneurysms of the superficial venous system, especially the medial marginal vein of the foot from soft tissue tumors such as ganglia or angiomas, may be difficult. Musculoskeletal ultrasound provides an opportunity to make clear distinctions and resolve such a diagnostic impasse.

Materials and Methods: We report the case of a 34-year-old male who presented with a painless, slowly enlarging mass, located on the dorsal aspect of the left foot and initially suspected to be a ganglion. Ultrasound evaluation was done using a Logic P9 GE machine, equipped with a 15 MHz high-frequency linear probe and Doppler.

Findings: The findings are those of a dilated, non-thrombosed mass, with sonographic features of a venous aneurysm of the medial marginal vein. It measures about 2.1 cm in diameter and 3.4 cm in length and has the classic "yin-yang" Doppler flow pattern, which confirms the diagnosis.

Conclusion: Although this condition is rare and poorly reported within the Nigerian population, a correct diagnosis through careful clinical examination and imaging is essential to determine the best course of treatment.

Keywords:

Introduction

Primary aneurysm of the medial marginal vein is rare and poorly reported within the Nigerian population. A correct diagnosis through careful clinical examination and imaging is essential to determine the best course of treatment. This condition may be confused with ganglion cysts, tendon pathologies, and bursitis, the use of color flow and pulsed Doppler applications is recommended for easy distinction[1].

Typically, surgical excision is preferred over sclerotherapy, as it reduces complications of the foot and the superficial parts of the sole of the foot[2]. During the last decades, the aneurysms of the superficial venous system have been diagnosed and described more frequently because of the wide implementation of vascular ultrasound[3]. However, there is still a paucity of documented literature on primary aneurysm of the medial marginal vein of the foot. We present the case of a primary aneurysm of the medial marginal vein of the foot in a young adult.

Case Report

A 34-year-old male presented to the department of medical imaging with a physician's referral of painless palpable mass, localized on the dorsal surface of the left foot. The patient has been examined by the referring physician who established the diagnosis of "Ganglion, r/o Angioma" and referred him for a soft tissue

ultrasound scan. On clerking the patient, he revealed that he first noted the swelling for over 5 years with slow progressive enlargement of the swelling. His recent medical history was unremarkable with no events of blunt trauma, puncture or any infectious process in the affected region of the right foot. Palpating the swelling revealed the non-tender, round, elastic, slightly mobile mass located subcutaneously on the dorsal surface of the right foot (Figure 1).

The ultrasound examination was performed with a GE Logiq P9 and a 7 -18 MHz multi-frequency transducer. The exam targeted the area of the palpable mass at the dorsal medial aspect of the midfoot. Based on clinical evaluation, the aneurysm of the superficial vein of the foot was suspected and Color Doppler and duplex ultrasound were performed to confirm the diagnosis. Duplex scanning showed the ovoid anechoic dilatation of the medial marginal vein of the foot measuring 2.1 cm in diameter and extending over a length of 3.4 cm with no thrombus inside. It also contains lots of low-level internal echoes. There was no detectable spontaneous flow in the lumen of the aneurysm with appearance of the yin-yang sign during the compression of the venous foot pump (Figure 2).

Figure 1: Appearance of a venous aneurysm of the medial marginal vein of the foot initially diagnosed as a foot ganglion (patient is in upright position)

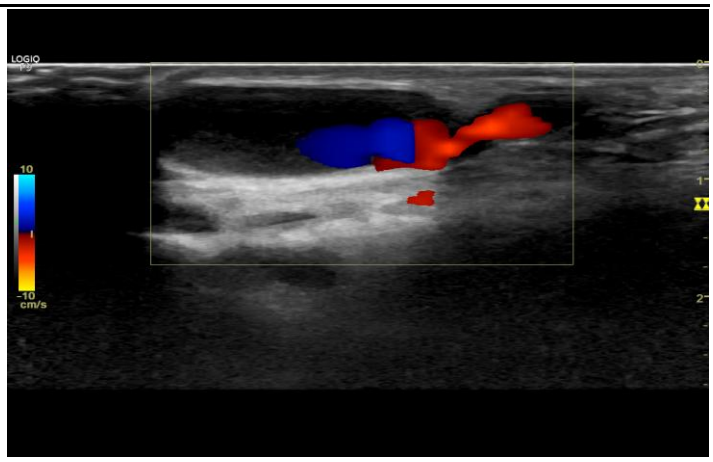

Figure 2: Turbulent flow inside the sac of aneurysm ("yin-yang" sign) detected by duplex ultrasound during the compression of venous foot pump

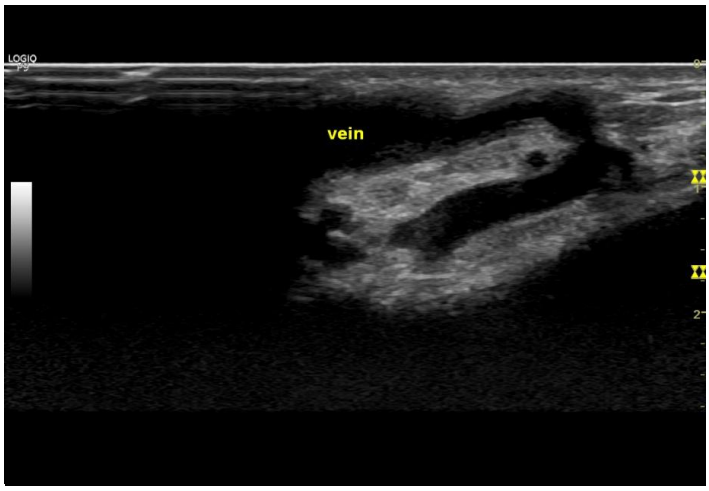

Figure 3 Dilated Primary Aneurysm of the Medial Marginal Vein of the Foot

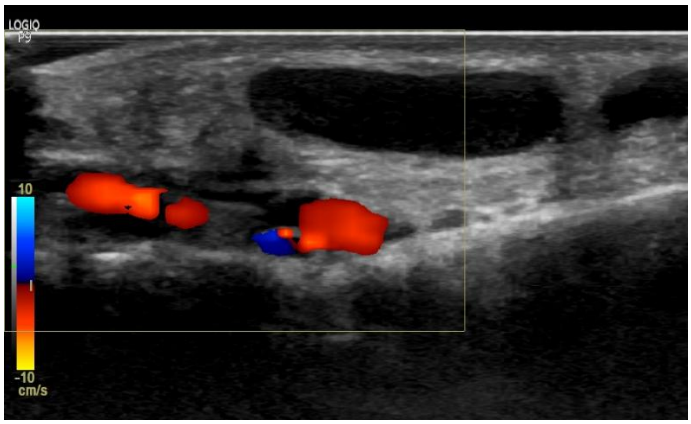

Figure 4: Dilated Primary Aneurysm of the Medial Marginal Vein of the Foot with color Doppler.

Discussion

The superficial venous aneurysms are usually benign pathological conditions with asymptomatic course although the development of thrombus in the lumen of

aneurysm can be associated with local inflammatory reaction and pain. There is also potential risk of significant bleeding in a case of traumatic injury of aneurysm[3]. Keshelava et al4 described two cases of proximal great saphenous vein aneurysm that resulted in pulmonary embolism. Because of its rarity, superficial venous aneurysms are frequently misdiagnosed by general practitioners and surgeons as lipomas or other soft tissue tumors[3]. Ultrasound imaging with a high-frequency transducer allows the sonographer to promptly evaluate the superficial structures of the foot, such as tendons, ligaments, vessels, nerves, capsulo-synovial tissues and cortical bones5. A painful mass located on the dorsal aspect of the foot can be related to several causes[6]. In our case, the anatomical location of the nodularity on the medial side of the dorsal foot implied a problem of differential diagnosis between the following:

i. tendinopathy and/or tenosynovitis of the extensor hallucis longus (EHL) tendon[7];
ii. a synovial or ganglion cyst originating from the Lisfranc joint[7];
iii. periostitis or stress fracture of the first metatarsal bone[7];
iv. adventitious bursitis related to mechanical stress[7];
v. pathology of the superficial venous network[8].

In our case, the patient was initially clinically diagnosed with foot ganglion r/o angioma. We presume that the difficulty in squeezing the mass during the initial examination of the patient in orthostatic position may be, at least theoretically, responsible for this erroneous diagnosis. Indeed, literature has revealed that limited compressibility of a venous aneurysm is possible when there is thrombosis of aneurysmal sac[3]. It was not a case in our patient, so we can suppose that a minimal compressibility during standing was caused by relative high pressure inside of the aneurysm transmitted from the plantar venous plexus of Lejar to the medial marginal vein via perforators: vein of the first metatarsal space and medial foot perforator veins3. It should be kept in mind that if a pathological mass is diagnosed at the level of the lower limb, it is always useful to examine the patient in both positions, upright and recumbent with elevated leg. The lump collapse with leg elevation is a pathognomonic sign of non-thrombosed venous dilatation[3]. In contrast to secondary venous aneurysm, which usually develops due to venous hypertension, trauma, or inflammation, the aetiology of primary venous aneurysms is not completely understood[3]. Interestingly, there are no obvious previously documented case reports of dorsal foot venous aneurysms within this locality (Nigeria), making our finding novel. Earlier reports in a 34-year-old female patient in the second trimester of pregnancy[3] and 45-year-old man[7] with aneurysms of the medial marginal vein and dorsal arch of the foot are documented.

In former case study, the impact of hormonal changes upon aneurysm development was suspected as the aneurysm started to grow during pregnancy and was considered as a specific feature of vascular malformations[3]. Burnley et al[9] also reported the case of a dissecting superficial venous aneurysm in the branch of small saphenous vein that appeared during the third trimester of pregnancy. The authors believe that haemodynamic changes characteristic for pregnancy, increased blood volume and cardiac output, can be responsible for focal venous dilatation. In another case report, the aetiology of dorsal foot venous aneurysm was attributed by authors to the trauma caused by repeated compression of the vein with sandal straps[10]. However, this original theory cannot explain the unilateral development of the aneurysm in that patient. We suppose that it is more correct to consider the primary venous aneurysm, either superficial or deep, as a venous malformation[3]. According to the modified Hamburg classification of congenital venous malformations, venous aneurysms refer to truncular localized dilated lesions. Truncular lesions do not have the embryonic characteristics of mesenchymal cells as observed in the extra-truncular lesions and hence do not possess the evolutional ability to proliferate[3]. The risk of recurrence after treatment of venous aneurysms is minimal to none, this fact being confirmed in all published cases.

Treatment of superficial venous aneurysm is usually indicated due to aesthetic considerations. Two curative

approaches for superficial venous aneurysms of the foot are described in the literature: sclerotherapy and excision. Although some authors report excellent clinical and aesthetic outcomes using sclerotherapy[3], in most cases the aneurysms are excised surgically. We support the latter approach due to the relative simplicity and high efficacy of excision. Sclerotherapy can lead to sac thrombosis which potentially can extend to the saphenous trunk. Moreover, the excision of the aneurysm allows the histopathological examination of the specimen.

In conclusion, this is, to the best of our knowledge, the first report of a primary aneurysm of the medial marginal vein of the foot within this locality (Nigeria). It can therefore be considered as a rare pathological condition that may easily be misdiagnosed as a soft tissue tumour. Careful clinical examination, with patients in different positions, followed by duplex ultrasound, will lead to correct diagnosis and treatment3. The authors hope that the present case report will increase the awareness of Sonographers, general practitioners, dermatologists, and surgeons regarding the superficial venous aneurysms of lower limbs. We recommend further investigations, to improve our understanding of the aetiology and pathogenesis of this disease.

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