Value Of Mickey Mouse Sign In Vascular Ultrasound Of The Upper Thigh :
A Case Report.
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Abstract.
The popular animated cartoon of Mickey mouse has been frequently referred to in the medical literature. This report is an addition to this list, whereby during vascular ultrasound of the upper thigh, a Mickey mouse sign is described, comprising of the common femoral vein and the lumina of the superficial and deep femoral arteries, representing the face and ears of the Mickey mouse respectively, when viewed axially from medial to lateral. This sign should serve as a guide to vascular sonologists and sonographers alike in differentiating the numerous vascular structures present in the upper thigh with ease.

Resume.
Le dessin animé animé populaire de la souris de Mickey a été fréquemment mentionné, à la littérature médicale. Ce rapport est une addition à cette liste, par lequel pendant des ultrasons vasculaires de la cuisse supérieure, un signe de souris de Mickey soit décrit, comportant de la veine fémorale commune et des lumens des artères fémorales superficielles et profondes, représentant le visage et les oreilles de la souris de Mickey respectivement, une fois vu axialement de médial à la partie latérale. Ce signe devrait servir de guide des sonologistes et des sonographes vasculaires de même en différenciant les nombreuses structures vasculaires actuelles dans la cuisse supérieure avec la facilité.

Keywords : Mickey mouse, Ultrasound, Common femoral vein, Superficial femoral artery, Profunda femoris artery.

Introduction
Mickey mouse, introduced in 1928 at the colony theatre, New York city, has become the famous character of Walt Disney’s animated cartoons with its characteristic over-large head and round ears. In addition to its numerous appearances in merchandise items, its appearance has been imported into medicine to aid in the description of various normal anatomical and pathologic structures in human beings.

Ultrasonographically, it has been used to describe the normal anatomical arrangement of the tubular structures in the porta hepatis, whereby the larger main portal vein and the two ductular structures of the common bile duct laterally and the hepatic artery medially, located anterior to the portal vein are visualized on transverse plane to form respectively the face and two ears of the Mickey mouse. Also, in first trimester ultrasonography, the appearance of anencephaly (which is different from the familiar second trimester sign) was found to conform to describe the Mickey mouse face when viewed on coronal plane. Similar pattern of Mickey mouse face arrangement was previously coined to the sonographic appearance of the common femoral vein (face) and the duo of common femoral artery and the great saphenous vein (the ears) in the upper thigh during vascular ultrasound imaging on transverse plane. The author recently discovered additional Mickey mouse sign in the upper thigh which has not been previously reported, comprising of the superficial and deep femoral arteries (the ears) and the common femoral vein (the face). The purpose of this communication is to report on this additional sign with the aim of serving as an aid in the differentiation of these tubular structures during vascular ultrasound of the upper thigh.

Case Report.
A.A. is a 41-year-old male, secondary school teacher who was recently appointed as a sports master in his school. He presented with a history of pains in both legs of one week duration. No history of leg swelling or trauma. He is neither a known hypertensive nor diabetic. His past surgical and medical histories were uneventful. The pain followed a recent sporting activity. Prior to this, he hardly engaged himself in such events, preferring a sedentary life style. On general examination, no abnormality was found and the systems were intact, except for the mild tenderness over the calf regions. An impression of muscle pains was entertained. Doppler ultrasound scan of the lower limb vessels was then requested to exclude other pathologies.

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Laboratory tests were unremarkable. The demonstrated leg veins showed normal colour flow and pulsed Doppler wave form (with normal respiratory phasicity and positive augmentation on instant flexion and extension of the toes), while those in the popliteal and thigh regions, in addition to the above signs were also compressible and no luminal echo was seen. The superficial saphenous veins and the arterial system from common femorals in the inguinal region to dorsalis pedis were intact bilaterally. The investigation was passed as normal. However, while scanning the upper thigh on transverse plane, at the level of common femoral artery (CFA) just after its bifurcation into superficial and deep femoral, three rounded tubular vascular structures were seen, two smaller ones anteriorly located, on top and lateral to a single wider and medially located tubular structure (Fig 1a). On Doppler interrogation and compression with transducer, the wider median lumen showed a typical venous wave form and was compressible (Right side of Figs 1 a & b), suggestive of common femoral vein (CFV). The smaller vessels were confirmed to be superficial femoral (anteriorly) and profound femoris (posteriorly) arteries (Fig 2) on pulsed Doppler. The whole appearance resembled the face of a Mickey mouse (the common femoral vein representing the face, while the two arteries represent the two ears of the Mickey mouse). The schematic diagram of these findings is as shown in fig. 3.

**Discussion**

Ultrasound is widely used in the assessment of disease in the lower limb vessels. The most frequent indication for ultrasound of the veins and arteries of the lower limbs are for the investigation of possible deep vein thrombosis and for the assessment of patients with ischaemic symptoms of the lower limbs respectively. Ultrasound provides a non-invasive and reliable method for examining the venous system, particularly with respect to the diagnosis or exclusion of dangerous proximal thrombus in symptomatic patients. It also provides information on the extent and severity of arterial disease allowing any subsequent arteriogram to be scheduled as either a straightforward mapping examination prior to bypass grafting, or as a more time-consuming angioplasty procedure.

Anatomically, the CFA runs from the inguinal ligament to its division into superficial and deep femoral (profunda femoris) arteries. The latter courses posterolaterally in the upper thigh. This division is usually 3-6 cm distal to inguinal ligaments. The major vascular drainage in the upper thigh consist of the profunda femoris and the superficial femoral veins. Their confluence forms the CFV and this normally occurs a little more caudal than the bifurcation of the CFA into superficial and deep femoral arteries.

The lumen of a normal vessel is usually anechoic on ultrasound. A normal vein is easily compressible with mild to moderate pressure from the transducer as exhibited by the CFV in our patient (Fig. 1 a & b), at the same time an artery will remain patent on pressure application (Fig 1). Where available, pulsed Doppler interrogation of the main arteries of the resting lower limbs with its typical triphasic wave form representing the pressure changes which occur in the arteries during cardiac cycle, could be applied to differentiate arteries from veins in the region of
the upper thigh (Fig 2). Other differentiating parameters include evaluation of peak systolic velocity and color flow pattern. The CFA and CFV in each limb enjoy side-by-side relationship with the vein lying medial to the artery. This arrangement was found to be more common towards the inguinal ligament. Thus, at a level just beyond the bifurcation of CFA, when viewed on axial plane, from medial to lateral to the lumina of the superficial femoral artery (SFA), CFV and the profunda femoris artery (PFA) could be seen to depict the appearance of the Mickey mouse face (the CFV) and ears (the SFA anteriorly and PFA posteriorly) as shown in Fig 3. The demonstration of this sign should serve as a guide to sonologists and sonographers while examining the upper thigh. This however must be distinguished from the previously reported Mickey mouse sign, comprising of the CFA, CFV and the great saphenous vein, which is commonly seen at the level of sapheno-femoral junction higher up than the one described above. Also, as different patterns of the vascular anatomy of these vessels can occur as a function of development, the sign may not be demonstrated in full in situations such as these.

In conclusion, it is suggested that whenever demonstrated, Mickey mouse sign comprising of the CFV, SFA and PFA from medial to lateral aspect of the upper thigh on axial view, should serve as a guide in differentiating the numerous vascular structures in this region with ease. Further research work is required to buttress this assertion.

References