DIFFERENTIAL DIAGNOSIS PROBLEMS OF THE UNILATERAL CALF OEDEMA

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Abstract:
Deep vein thrombosis is the first diagnosis suspicion in front of a patient with spontaneous and provoked calf-ache and unilateral calf oedema. As the clinical diagnosis of deep vein thrombosis is often difficult, it requires confirmation by a paraclinical, non-invasive method. The purpose of the study: to establish the role of Doppler vein sonography in differential diagnosis of deep vein thrombosis.

Method and material: 50 patients addressed for Doppler vein sonography were studied. Part of the patients had a clinical diagnosis of deep vein thrombosis and no response to anticoagulant treatment, part had a different first clinical diagnosis and sonography was requested in order to rule out a deep vein thrombosis.

Results: The sonographic evaluation confirmed the deep vein thrombosis in some patients, while other pathological conditions with the same physical signs and symptoms were also diagnosed (calf ripped cysts, popliteal artery aneurism, calf tumor formation, muscle rip, primitive symptomatically varicosity, post thrombosis syndrome).

Conclusions: The sonographic venous evaluation is an extremely useful non-invasive method for establishing a positive and differential diagnosis of deep vein thrombosis.

Keywords: calf oedema, DVT, Doppler ultrasound.

Introduction

Deep vein thrombosis is the first diagnosis suspicion in front of a patient with spontaneous and provoked calf-ache and unilateral calf oedema. As the clinical diagnosis of deep vein thrombosis is often difficult, it requires confirmation by a paraclinical, non-invasive method.

The profound vein status can be verified by an objective, non-invasive and very accessible method named ultrasonography. It is known the fact that the main disease in which the venous Doppler ultrasonography has a large contribution is the deep vein thrombosis.

The first data related to the use of Doppler effect in the study of venous circulation were published on 1967-1968. The application of ultrasonography in the peripheral venous study evolved considerably after 1970, first with the continuous Doppler and after that, in 1990 with the enhanced color and pulse Doppler.

The ultrasonography is important not only in establishing the positive diagnosis of deep vein thrombosis, but also it offers information about the topographic diagnosis, the stage of thrombus and differential diagnosis.

Working purpose

The purpose of the study is to analyze the role of Doppler ultrasonography for the differential diagnosis of deep vein thrombosis in the author’s personal experience.

Method and material

50 patients with unilateral calf oedema addressed for ultrasound vein evaluation were enrolled into the study. For part of the patients the ultrasound vein exam was requested in order to confirm the clinical diagnosis of deep vein thrombosis, while for others the first clinical
diagnosis was different and ultrasound exam was requested in order to rule out a deep vein thrombosis.

A high performance Doppler ultrasonography, with color Doppler, pulse Doppler, Duplex and linear and variable bandwidth probe were used.

**Results and discussion**

During ultrasonography examination of the patients, which were suspected of deep vein thrombosis, other pathological conditions, with similar clinical signs and symptoms as deep vein thrombosis, were diagnosed. Part of those are presented in table 1.

Table 1.

<table>
<thead>
<tr>
<th>Condition</th>
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<tbody>
<tr>
<td>Popliteal cyst</td>
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<tr>
<td>Haematoma</td>
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<tr>
<td>Aneurysm / pseudo aneurysm</td>
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<tr>
<td>Lymphatic oedema</td>
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<tr>
<td>Muscle tumor</td>
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<tr>
<td>Muscle trauma (disruption)</td>
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<td>Oedema after a long period of plaster immobilization</td>
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<td>Stasis oedema</td>
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<tr>
<td>Postthrombotic syndrome</td>
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<td>Primitive simple varicosity</td>
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</table>

From the total of 50 analyzed patients, the ultrasound vein exam confirmed the presence of deep vein thrombosis in different stages in 18 patients. It is good to remind the fact that not all of those 50 patients had the first suspicion of deep vein thrombosis, some of them being suspected of diseases that have the same clinical signs as the thrombosis and which were usually confirmed. Unfortunately a number of 4 patients were clinically diagnosed with deep vein thrombosis, admitted and treated for this condition and only after it was observed the negative response to the treatment they were addressed for ultrasonography exam.

The Doppler ultrasonography established in these cases the diagnosis of popliteal ripped cyst in 3 cases and popliteal artery aneurysm in 1 case, making the differential diagnosis with the profound venous thrombosis.

From those 8 patients diagnosed with popliteal cyst, 3 were diagnosed and treated like thrombosis, 2 of them came as emergencies with a suspicion of acute thrombosis, before starting a treatment and the other 3 came with the suspicion of popliteal cyst for confirming and differential diagnosis.

Echographic, the popliteal cyst appears as a transsonic image, with posterior intensification, variable dimensions, well-contoured, variable shape, sometimes with septum. The Backer cyst is formed by liquid accumulation in the gastrocnemian space and eventually of the semimembranous muscle (of semi-circular shape, which surrounding the gastrocnemian muscle head). In 30-50% of cases there is a communication of the cyst with the joint through a unique sense valve, a tunnel structure of approximate 2 cm. If these cysts are broken, clinically produces pain,
oedema, sometimes even inflammatory signs. But the deep veins are compressible.

A particular case was of one patient diagnosed with a popliteal artery aneurysm, knowing that the popliteal location of aneurysms is very rare.

The arterial aneurysm represents a cavity with an expansion and thrombosis tendency, formed by damaging and dilating the arterial wall – the true aneurysm, and a new format wall out of the vessel, with which it is in communication – the fake aneurysm. The most frequently location is at the abdominal aorta level and rarely at the primitive iliac and popliteal artery level. The complications of the aneurysm are: disruption (major complication of the aortic and iliac aneurysm), dissection, thrombosis and distal embolism with acute ischemia and amputation risk (major complication of the popliteal aneurysm). The identification of a popliteal aneurysm requires a surgical or endo vascular correction. The aneurysm appears sonographically as a sack- or spindle form cavity, nonechogenic, with spontaneously contrast, eventually with thrombosis. The pulse Doppler with the sample volume placed at the level of the aneurysm identifies a biphasic flow of low amplitude. The pseudoaneurysm can be spontaneous, posttraumatic or iatrogen (after catheterization).

Another pathology that we encountered was related to muscle tissue: 1 case of muscle tumor, 1 case with haematoma and 2 cases of muscle rip. The muscle tumor case was diagnosed later also by computer tomography (CT), and 1 of those two muscle rip cases by magnetically resonance imaging (MRI).

The muscular ultrasound emphasis’s, on transversal section the hypoechogenic fascicles that are separated by hyperechogenic points of perimusium, epimusium, fascia, the appearance been dotted and in longitudinal section, like a comb. At the time of contraction the thickness of muscle increase, the ecogen stripes become more oblique, and the muscular fascicles become more hypoechogenic. In the case of straight exterior striking, acute appears the irregular haematoma that is hypoechogenic, inhomogeneous, after 2-3 days becomes transonic liquid, and chronic becomes ecogen scar. In
the case of extent break, appear micro breaks with a microcystic pattern on cross section, and elongated pattern on longitudinal section. In the severe trauma, in the place of a break appears the haematoma, the fibers lose their continuity, the sign of “bell tongue”.

In the diagnosis of muscular rupture, the ultrasound represents the same method like IRM, but clearly, at a lower price.

In one case from those studied, the patient has presented a discreet unilateral edema after prolonged immobilization, without profound venous thrombosis, two cases have presented stasis oedema, and other two cases lymphoedema.

The stasis oedema is superficially localized, and a pulsated flow is present at the level of proximal vein. Normally, the flow from femoral common vein has respiratory modulation. In the right cardiac failure, because of the increase of central venous pressure, the flow in common femoral vein becomes pulsate.

In lymphoedema are described interstitial aecogene channels, the vein are permeable, but difficult to visualize.

In the studied group, seven cases have presented postthrombotic syndrome, two of them have presented relapse of profound venous thrombosis, and seven cases have presented primitive symptomatic milklegs, profound venous ax been free.

In conclusion, the ultrasound is very useful to establish the positive and the differential diagnosis of deep vein thrombosis, a noninvasive, accessible and low cost method.

References: