SÍNDROME MAY-THURNER: IMPORTÂNCIA DO IVUS NO ALGORITMO DIAGNÓSTICO E TERAPÊUTICO

MAY-THURNER SYNDROME: THE IMPORTANCE OF IVUS IN THE DIAGNOSTIC AND THERAPEUTIC ALGORITHM

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RESUMO

Introdução: A síndrome de May Thurner (SMT) é uma condição clínica resultante da compressão anatómica da veia ilíaca comum esquerda pela quinta vértebra lombar posteriormente e pela artéria ilíaca comum direita anteriormente associada a sintomatologia. Afirmar o seu diagnóstico pode ser difícil e a ultrassonografia intravascular (IVUS) pode ajudar na decisão definitiva.

Caso Clínico: Homem de 43 anos com história de trombose venosa profunda do membro inferior esquerdo recorre à consulta com história de edema do membro inferior esquerdo com agravamento desde há cinco meses associado a incapacidade de ficar em pé por longos períodos , facto que o impedia de realizar a sua atividade laboral.
Realizou flebo-TC no enatnto este foi inconclusivo.
Foi proposto ao paciente a realização de flebografia e IVUS para eliminar as dúvidas e aumentar a acuidade diagnóstica.
A flebografia e o IVUS confirmaram a compressão significativa da veia ilíaca comum esquerda pela artéria ilíaca comum direita (imagem 1).
O paciente foi tratado através da implantação endovascular de um *stent* Abre 16/80 da Medtronic, seguido da dilatação com um balão 16/40 da Boston Scientific.
A flebografia e o IVUS de controle mostraram a resolução completa da compressão. (Imagem 2)

Discussão/Conclusão: O diagnóstico do SMT pode ser difícil e implica alto grau de suspeita clínica. O veno-TC pode não ser diagnóstico e ser necessário flebografia e IVUS.
A cirurgia endovascular revolucionou o tratamento da doença venosa obstrutiva, tornando-se o *gold* standart terapêutico. No entanto, o implante de *stents* numa população jovem implica cuidados acrescidos devido ao desconhecimento de seu comportamento a longo prazo.
Neste caso, o IVUS permitiu aumentar o grau de certeza diagnóstica e aumentar a qualidade do controle terapêutico do *stenting* ílio-cava.
Nós recomendamos o uso do IVUS de forma rotineira na abordagem do SMT.

Palavras-chave
Síndrome Cockett; Síndrome May thurner; Síndrome compressão da veia ilíaca; *Stenting*; IVUS

ABSTRACT

Introduction : *May Thurner Syndrome (MTS) is a clinical condition as a result of an anatomical compression of the left common iliac vein by the fifth lumbar vertebra posteriorly, and by the right common iliac artery anteriorly associated with symptomatology. Affirming the diagnosis can be difficult and intravascular ultrasonography (IVUS) can help in the definitive decision.*

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Clinical Case: *A 43 years old man with a past history of a deep venous thrombosis of the left lower limb presented at our clinical appointment with a 5 months history of left limb edema and inability to stand up for long periods of time, disabling him from working.*
A venous-CT scan was obtained to diagnose the condition but was inconclusive.
It was proposed to the patient to carry out a phlebography and an IVUS to eliminate the doubt and increase the diagnosis acuity, which was accepted.
A phlebography and IVUS confirmed a significant compression of the left common iliac vein (image 1).
The patient was treated by endovenous placement of an Abre 16/80 medtronic stent followed by dilatation with a 16/40 balloon Boston scientific.
The phlebography and IVUS control showed complete resolution of the compression. (Image 2)

Discussion/Conclusion: *The diagnosis of MTS can be difficult and implies a high degree of clinical suspicion.*
The TC scan alone may not be diagnostic. The phlebography, and especially the more recent IVUS technology increases the accuracy of the diagnosis.
Emergence of endovascular surgery revolutionized the treatment of obstructive venous disease, and became the gold standard of treatment. However, the implantation of stents in a young population implies additional cautions due to the lack of knowledge about their behavior over the long term.
In this clinical case, the IVUS allowed us to reach the diagnosis and to increase the therapeutic accuracy of the ilio-cava stenting.
We recommend the routine use of IVUS in the management of MTS.

Keywords
Cockett Syndrome; May Thurner syndrome; Iliac vein stentig; Compression syndrome; Stenting; IVUS

INTRODUCTION

The May Thurner Syndrome (MTS) is a clinical condition as a result of an anatomical compression of the left common iliac vein (LCIV) by the fifth lumbar vertebra posteriorly and by the right common iliac artery (RCIA) anteriorly associated with symptomatology. This phenomenon can cause venous stasis in the pelvis and left lower limb and can be precursor of a deep venous thrombosis. The association of other venous compression like Nutt- Cracker syndrome can enhance this venous stasis[1].
From an historical perspective this syndrome was first described by Virchow, in 1851, who noticed that there was a predominance of iliofemoral deep vein thrombosis (DVT) on the left lower limb, reaching a frequency 5 times higher, in relation to the right lower limb. He defined the syndrome as a repetitive and chronic compression of LCIV by the RCIA, with the consequent development of synechiae inside the LCIV. In 1908, Mc Murrich, (in a cadaveric study, observed internal adhesions in the common iliac veins and postulated that these were congenital and responsible for the highest incidence of DVT[2]. In 1943, Ehrich and Krumbhaar observed that 23.8% of adults had intravenous lesions in the LCIV and the histological analysis showed that they consisted of elastin and collagen, showing that the lesions were acquired and not congenital[3].
In 1957, May and Thurner examined 457 cadavers and observed lesions in the LCIV in 22% of the cases, classifying them as spurs, dividing them into 3 types[4, 5].
In 1965, Cockett and Thomas described the first clinical series of 57 patients with acute ilio-femoral DVT, secondary to LCIV compression by the RCIA[6].
Precise diagnosis and quantification of the compression are key elements to a successful treatment in this young population. The diagnosis is based on the association of symptoms and the interpretation of imaging tests such as CT or MR. However, sometimes there are disagreements in the interpretation of these exams and this must be solved.

CLINICAL CASE

A 43 old man with a past history of a deep venous thrombose of the left lower limb 13 years ago following an inguinal hernioplasty, presented with a long history of left limb edema and inability to stand up for long periods of time. These symptoms deteriorated in the previous five months disabling him from working.
The physical examination showed global edema of the left lower limb associated with venous dermatitis in the medial malleolar area.
A venous ultrasound was performed which revealed reflux of the left popliteal vein, the great saphenous vein and the small saphenous vein.

A venous-CT scan was done but lead to a disagreement between the radiologist report, stating no relevant compression of the left common iliac vein by the right common iliac artery and the vascular surgeon's assessment. (Image 1)
A phlebography and an endovascular ultrasound (IVUS) was then performed which confirmed the compression (Image 1).

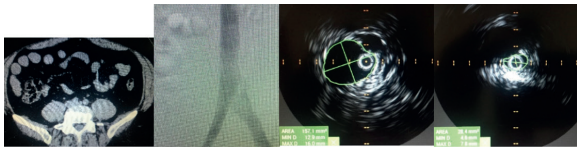

Image 1 *Venous-CT, phlebography and IVUS that shows severe compression of the left common iliac vein by the right common iliac artery side.*

The patient was anticoagulated. An Abre 16/80 stent (medtronic) was implanted with posterior dilation with a 16/4 balloon (Boston Scientific). The phlebography and endovascular ultrasound control showed complete resolution of the compression. (Image 2)

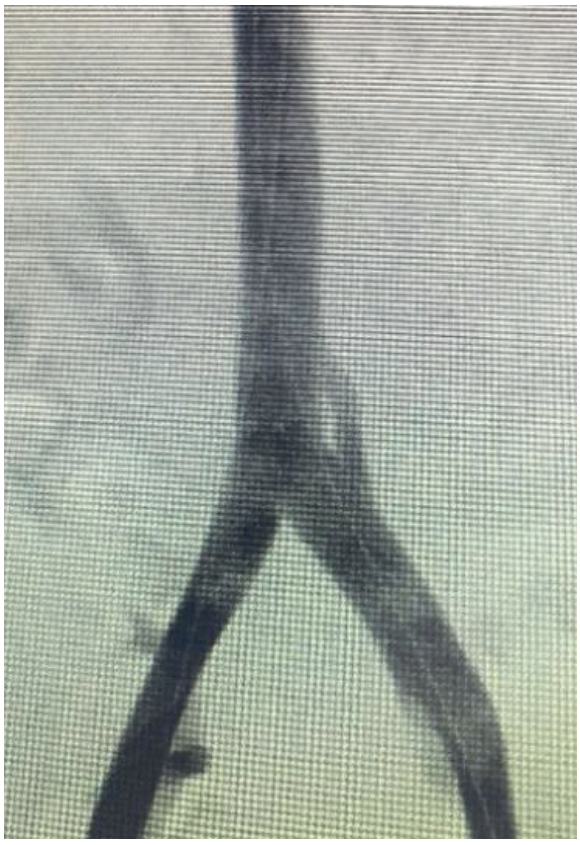

Image 2 *Phlebography control after stenting with resolution of the compression.*

In the postoperative period, the patient maintained anticoagulation with LMWH and intermittent pneumatic compression of the lower limbs, being discharged at 24h with oral anticoagulation (DOAC-rivoroxaban) and elastic stockings.
At 3 months follow-up, the patient was asymptomatic and had resumed his work.

DISCUSSION

The diagnosis of MTS demands a high degree of clinical suspicion, as the symptoms can be associated with such clinical as superficial venous reflux, post-thrombotic syndrome and primary lymphedema[6].
The lower limb venous doppler ultrasonography is the first line exam because it is non-invasive and simple to perform. However the visualization of common iliac veins is technically difficult, deeming the exam not sensitive enough to detect LCIV compression or their intraluminal defects. At least 20% of the iliac vein ultrasound studies performed are not diagnostic[7].
The Doppler ultrasound is of great value in the evaluation of infra-inguinal venous disease, a very prevalent disease.
If no anomaly is found at this level or the anomaly does not justify the clinical picture, the ilio-cava sector should be studied with CT or MRI. CT and MR are the exams of choice for the study of SMT[8].
In addition to allowing the demonstration of direct compression of LCIV by the RCIA and the compensatory collateral circulation, they can also exclude extrinsic compressions, such as tumors, hematomas or retroperitoneal fibrosis. CT scan is the most used exam in this diagnosis due to its availability and lesser time consumption. MRI is less available and therefore less routinely used. However, it easily demonstrates the area of compression or obstruction and the existence of collateral circulation[9–11].

Phlebography by puncture of a vein in the foot is insufficient to obtain a good visualization of the femoral-ilio-cava venous sector. Phlebography by femoral puncture is usually performed. In addition to demonstrating LCIV compression, demonstrates collateral venous circulation and allows measuring the pressure gradient induced by the obstruction. This gradient must be greater than 2mmHg, at rest, and 3mmHg, after exercise[12, 13]. However, there is currently no hemodynamically credible test to target the degree of venous obstruction and the hemodynamic improvement after stenting.

Intravascular ultrasound (IVUS) is a more recent exam that can measure the size of the vessels, the internal morphology of the vessel and the degree of stenosis, as well as facilitating the accuracy of stent implantation[8,14]. Forauer et al stated that its use interfered with the endovascular treatment of SMT in 50% of the cases[15]. Montminy M. et al stated that phlebography when compared with IVUS fails to identify a lesion in 19 % of the cases and misses the location of maximal stenosis in more than two–thirds of the limbs[16]. As observed in our clinical case, the IVUS allowed us to increase the accuracy of the diagnosis and to improve the adequacy the ilio-cava stenting. So IVUS has revealed an increasing utility in confirming the diagnosis and helping to improve the therapeutic quality in the endovascular treatment of SMT[17]. However, the acquisition cost has limited the availability of de IVUS. Endovascular surgery revolutionized the treatment of obstructive venous disease, due to its low physiological aggressiveness, high safety, good efficacy and a complication rate lower than 2%[18–21]. Osman Ahmed et al in a recent review of his experience in the endovascular treatment of SMT, reported a a technical success of 100%, with no major complications and a complication rate of less than 5%[22]. Wan-Yin Shi et al[23] published their experience with the endovascular treatment of SMT, in 233 patients, referring a technical success in its uncomplicated form of 98.5%. Machado M. et al[24] reports in the endovascular treatment of MTS a technical success of 100%, a primary patency of 85.7% and an assisted primary patency of 100%. The ilio-caval stenting became the gold standard for the treatment of MTS.

CONCLUSION

Insufficient knowledge about the natural history of MTS results from uncertainty in the diagnosis criteria and treatment selection of MTS patients.
We recommend, when available, the routine use of IVUS in the management of May Thurner Syndrome.

REFERENCES

1. *Machado M, Machado R et al. May thurner syndrome associated with nutcracker syndrome: clinical case and literature review. Angiol Cir Vasc 2017, Vol 13, n.3 , pp. 52-57*
2. *McMurrich, JP. The occurrence of congenital adhesions in the common iliac veins and their relation to thrombosis of the femoral and iliac veins. Am J Med Sci. 135, 1908, pp. 342-346.*
3. *Ehrich, WE e Krumbhaar, EB. A frequent obstructive anomaly of the mouth of the left common iliac vein. Am Heart J. 26, 1943, pp. 737-750.*
4. *Patel, NH, et al. Endovascular management of acute extensive iliofemoral deep venous thrombosis caused by May-Thurner syndrome. J Vasc Interv Radiol. 11, 2000, pp. 1297-302.*
5. *May, R e Thurner, J. The cause of the predominantly sinistral occurrence of thrombosis of the pelvic veins. Angiology. 8, 1957, pp. 419-448.*
6. *Cockett, FB e Thomas, ML. The iliac compression syndrome. Br J Surg. 52, 1965, pp. 816-21. 7. O'Sullivan, GJ, et al. Endovascular management of iliac vein compression (MayThurner) syndrome. J Vasc Interv Radiol. 11, 2000, pp. 823-836.*
7. *O'Sullivan, GJ, et al. Endovascular management of iliac vein compression (MayThurner) syndrome. J Vasc Interv Radiol. 11, 2000, pp. 823-836.*
8. *Shebel, ND e Whalen, CC. Diagnosis and management of iliac vein compression syndrome. J Vasc Nurs. 23, 2005, pp. 10-17.*
9. *Hurst, DR, et al. Diagnosis and endovascular treatment of ilio-caval compression syndrome. J Vasc Surg. 34, 2001, pp. 106-113. Pages 43 de 74*
10. *Wolpert, LM, et al. Magnetic resonance venography in the diagnosis and management of May-Thurner syndrome. Vasc Endovascular Surg. 36, 2002, pp. 51-57.*
11. *Ley, EJ, et al. Endovascular management of iliac vein occlusive disease. Ann Vasc Surg. 18, 2004, pp. 228-233.*
12. *Rigas, A, Vomyoyannis, A e Tsardakas, E. Iliac compression syndrome: report of ten cases. J Cardiovasc Surg. 11, 1970, pp. 389-392.*
13. *Taheri, S, Taheri, P e Schultz, R. Iliocaval compression syndrome. Br J Surg. 40, 1992, pp. 9-15. 76. Gloviczki, P e Cho, JS. Surgical treatment of chronic occlusions of the ilicaval veins. RB Rutherford. Rutherford's vascular surgery. Philadelphia: Elsevier, 2005, pp. 2303-2320.*
14. *Canales J F, Krajcer Z. Intravascular ultrasound guidance in treating May Thurner Syndrome. Tex Heart Inst J 2010;37(4):496-497*
15. *Forauer, AR, et al. Intravascular ultrasound in the diagnosis and treatment of iliac vein compression (May-Thurner) syndrome. J Vasc Interv Radiol. 13, 2002, pp. 523-527.*
16. *Montminy M L et al A comparison between intravascular ultrasound and venography in identifying key parameters essential for iliac vein stentingJ Vasc Surg Venous Lymphat Disord 2019 Nov;7(6):801-807.*
17. *Neglén, P e Raju, S. Intravascular ultrasound scan evaluation of the obstructed vein. J vasc Surg. 35, 2002, pp. 694-700.*
18. *Ye, K, et al. Long-term outcomes of stent placement for symptomatic nonthrombotic iliac vein compression lesions in chronic venous disease. J Vasc Interv Radiol. 23, 2012, Vol. 4, pp. 497-502.*
19. *Meng, QY, et al. Endovascular treatment of iliac vein compression syndrome. Chin Med J (Engl). 124, 2011, Vol. 20, pp. 3281-3284.*
20. *Raju S, Ward Jr M, Kirk O. A modification of iliac vein stent technique. Ann Vasc Surg. 28, 2014, Vol. 6, pp. 1485-1492.*
21. *Mahnken, AH, et al. Cirse standards of practice guidelines on iliocaval stenting. Cardiovasc Intervent Radiol. 37, 2014, pp. 889-897.*

22. *Shi, WY, et al. Endovascular treatment for iliac vein compression syndrome with or without lower extremity deep vein thrombosis: a retrospective study on mind-term-in-stent patency from a single center. European Journal of Radiology*
23. *Machado M, Machado R et al. Primary may-thurner syndrome, clinical and endovascular surgical results: Our experience. Angiol Cir Vasc 2018, vol.14, n.1, pp.22-37. ISSN 1646-706X.*