

# The Myth of May Thurner

## Der Mythos May Thurner

### Author

Irwin M. Toonder

### Affiliation

European Vascular Centre Aachen- Maastricht, University Hospital Aachen, Maastricht, University Hospital, the Netherlands

### Key words

May Thurner, compression, iliac vein, spur

### Schlüsselwörter

May Thurner, Kompression, Iliakalvene, Beckenvenensporn

### Bibliography

DOI <https://doi.org/10.1055/a-1213-0756>

Published online: July 22, 2020

Phlebologie 2020; 49: 230–232

© Georg Thieme Verlag KG, Stuttgart · New York

ISSN 0939-978X

### Correspondence

I. M. Toonder

European Venous Centre

Maastricht University Medical Centre, P. Debyelaan 25, PO box 5800, 6202 AZ Maastricht, The Netherlands

toonder@gmail.com

### ZUSAMMENFASSUNG

Durch weniger invasive, moderne endovenöse Techniken mit verbesserten Stents ist eine bessere und sicherere Behandlung des May-Thurner-Syndroms (MTS) möglich. Klare Kriterien für die genaue Diagnose sind jedoch nach wie vor nicht festgelegt. Bildgebende Verfahren werden in Rückenlage durchgeführt, wobei eine Kompression der linken Iliakalvene

sowohl bei asymptomatischen als auch bei symptomatischen Patienten beobachtet wird – es gibt keinen eindeutigen Schwellenwert. Zudem gibt es keine validierten hämodynamischen Kriterien. Aufgrund dessen ist die Erhebung zusätzlicher Informationen notwendig: Es sollten Messungen in aufrechter Position sowie genauere Untersuchungen fibröser Wandverdickungen, des Beckenvenensporn und venöser Kollaterale durchgeführt werden. Darüber hinaus sollten Ärzte, die das MTS behandeln, sich nicht nur auf spezifische Symptome konzentrieren, sondern bedenken, dass den Beschwerden auch eine komplexere Darstellung des pelvinen Stauungssyndroms zugrunde liegen kann.

### ABSTRACT

Less invasive contemporary endovenous techniques with improved stents have made treatment of the May Thurner Syndrome (MTS) more accessible and safer. However, clear criteria for the accurate diagnosis remain obscure. All imaging modalities are performed with patients in a supine position where compression of the left Common Iliac Vein is seen in both asymptomatic and symptomatic patients. There is no clear threshold value. There are no validated hemodynamic criteria. This leads to the necessity of additional information such as measurements performed in an upright position as well as greater scrutiny in detecting fibrous wall thickening and spurs as well as identifying the presence of venous collaterals. Moreover, those contemplating treating MTS should not only identify specific symptoms, but also should consider that patient complaints may be related to a more complex presentation of pelvic congestion.

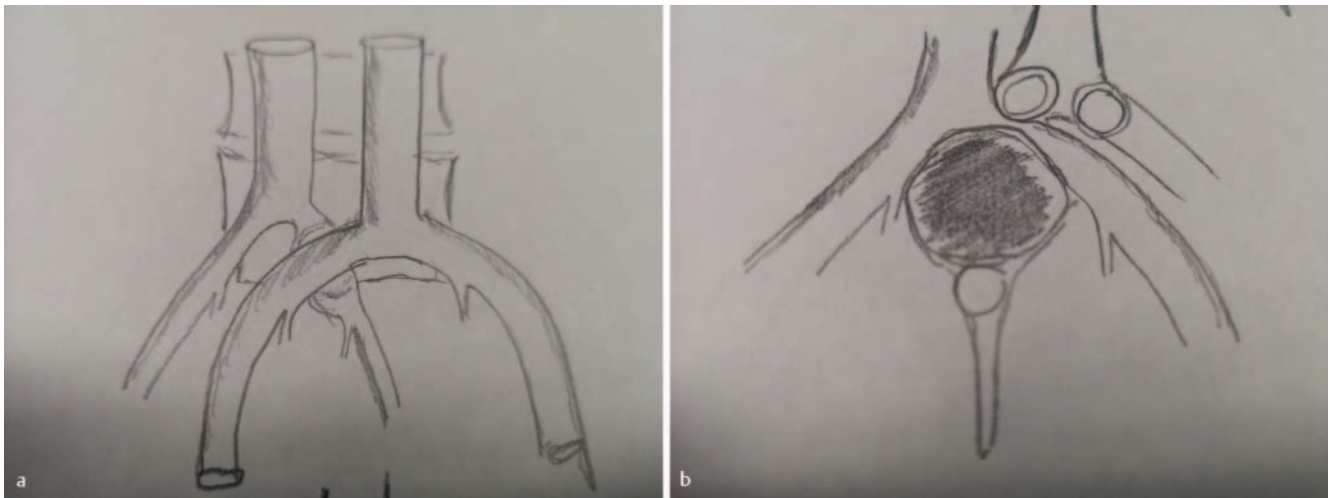
Nowadays, with the evolution of less invasive endovenous techniques and the arrival of a greater variety of improved stents specifically designed for the treatment of deep venous obstruction, there is an increased necessity for a more accurate understanding of what is perceived to be a May Thurner syndrome (MTS) [1]. Often the MTS is described as an Iliac vein compression syndrome [2, 3]. (► Fig. 1a, b)

However with the human body in a supine position, intermittent venous compression at multiple levels is quite common without necessarily being a pathological condition. Studies targeting the left common iliac vein, investigating asymptomatic subjects, have found significant compression and diameter reduction in up

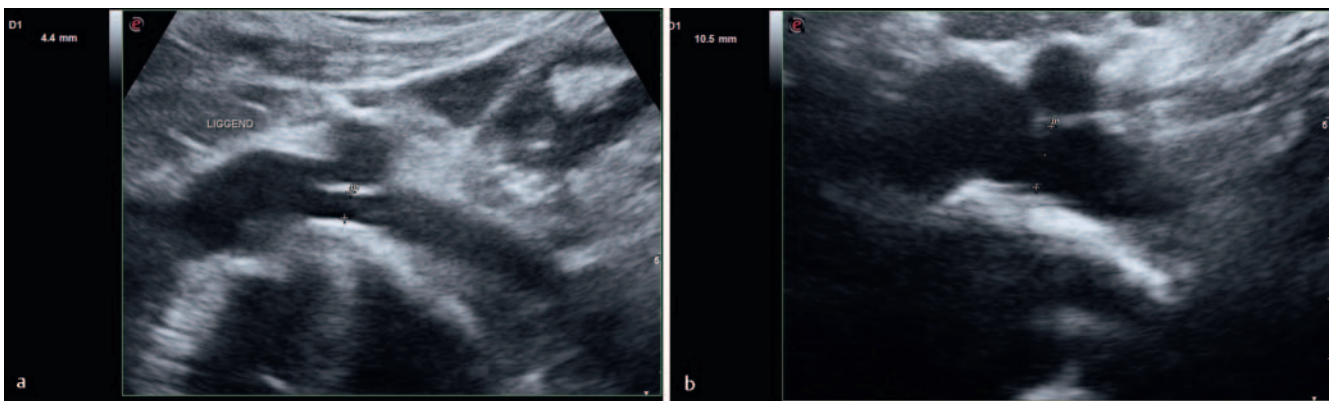
to 80 % of their cohort [4, 5]. Such publications have led to discussion whether modern diagnostic tools performed on patients predominantly in a supine position may lead to over treatment on the basis of false positives [6]. It is perceived that modern available diagnostic tools may fall short as it is suggested that patients should also be assessed in an upright position [7]. Duplex ultrasound (DUS) is one of the few diagnostic imaging tools capable of comparing supine with upright images. (► Fig. 2).

This potentially may lead to MTS becoming a myth as justifiably the question is asked to define a pathological MTS [8].

Virchow was the first to report a higher prevalence of deep venous thrombosis in the lower left extremity as a result of compres-



► **Fig. 1** a, b represent an often presented impression of the point of compression of the right Common Iliac Artery on the left Common Iliac Vein.



► **Fig. 2** Patient supine above versus patient upright below with significant decrease of left Common Iliac Vein compression where diameter values increase significantly in an upright position.

sion of the left Common Iliac vein (LCIV) [9]. May and Thurner corroborated earlier cadaver studies finding lesions which they described as 'spurs' in the LCIV in 22 % of their 430 cadavers [10]. Previous cadaver reports had shown LCIV fibrotic material to exist in 24–30 % [11, 12]. However, the exact cause of these spurs remains uncertain and may not only purely be attributed to the effects of arterial compression. [13]

Cockett and Thomas were pioneers in the sense that during surgery they distinguished between an acute phase with an occlusion on the basis of deep venous thrombosis without evident fibrosis and a chronic phase nowadays described as post thrombotic syndrome. In their cohort, chronic patients would have fibrous scarification [14].

However, with time, the emphasis on the presence of fibrous material has become lost in translation as physicians focus on the patient symptoms. Acute MTS is often associated with acute deep venous thrombosis (DVT). [15] Chronic MTS presents itself on the basis of chronic venous hypertension characterized by signs of chronic venous insufficiency, varicose veins, skin changes such as hyperpigmentation, lipodermatosclerosis, ulceration as well as

chronic leg pain. MTS increasingly is taken into consideration when patients suffer from Pelvic Congestion syndrome.

Diagnostic tools are DUS, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Intravascular Ultrasound (IVUS) and contrast venography. Importantly CT, MRI and contrast venography are used to see whether compression of the LCIV is combined with the presence of numerous tortuous venous collaterals as well as anatomical asymmetry. Although operator dependent, DUS in the hands of a skilled ultrasonographer, can acquire similar information as well as important complementary hemodynamic information.[16, 17]

To summarize, MTS is not purely based on the severity of the LCIV compression, but is in conjunction with anatomical changes such as fibrous spurs, thickened vein walls in the presence of venous collaterals.[18]

In conclusion, it is recommended that physicians should not just focus on LCIV when attempting to evaluate MTS. Often a more comprehensive approach is required where physicians should not rely on one diagnostic tool.[19]

## Conflict of Interest

The authors declare that they have no conflict of interest.

## References

- [1] Lugo-Fagundo C, Nance JW, Johnson PT et al. May-Thurner syndrome: MDCT findings and clinical correlates. *Abdom Radiol (NY)* 2016; 41 (10): 2026–2030. doi:10.1007/s00261-016-0793-9
- [2] Brinegar KN, Sheth RA, Khademhosseini A et al. Iliac vein compression syndrome: Clinical, imaging and pathologic findings. *World J Radiol* 2015; 7 (11): 375–381. doi:10.4329/wjr.v7.i11.375
- [3] Donatella N, Marcello BU, Gaetano V et al. What the Young Physician Should Know About May-Thurner Syndrome [published correction appears in *Transl Med UniSa* 2015 Dec; 13: 65]. *Transl Med UniSa* 2014; 12: 19–28. Published 2014 Sep 1
- [4] Kibbe MR, Ujiki M, Goodwin AL et al. Iliac vein compression in an asymptomatic patient population. *J Vasc Surg* 2004; 39 (5): 937–943. doi:10.1016/j.jvs.2003.12.032
- [5] van Vuuren TMAJ, Kurstjens RLM, Wittens CHA et al. Illusory Angiographic Signs of Significant Iliac Vein Compression in Healthy Volunteers. *Eur J Vasc Endovasc Surg* 2018; 56 (6): 874–879. doi:10.1016/j.ejvs.2018.07.022
- [6] Richards T. Re. “Illusory Angiographic Signs of Significant Iliac Vein Compression in Healthy Volunteers”. *Eur J Vasc Endovasc Surg* 2019; 57 (4): 604. doi:10.1016/j.ejvs.2018.12.033
- [7] van Vuuren TMAJ, de Graaf R. Response to “Re. Illusory Angiographic Signs of Significant Iliac Vein Compression in Healthy Volunteers”. *Eur J Vasc Endovasc Surg* 2019; 57 (4): 604–605. doi:10.1016/j.ejvs.2019.01.012
- [8] Hameed M, Onida S, Davies AH. What is pathological May-Thurner syndrome? *Phlebology* 2017; 32 (7): 440–442. doi:10.1177/0268355516680458
- [9] Virchow R (1856) “Thrombose und Embolie. Gefässentzündung und septische Infektion”. *Gesammelte Abhandlungen zur wissenschaftlichen Medizin* (in German). Frankfurt am Main: Von Meidinger & Sohn. pp. 219–732. Matzdorff AC, Bell WR (1998). *Thrombosis and embolie* (1846–1856). Canton, Massachusetts: Science History Publications ISBN: 0-88135-113-X
- [10] May R, Thurner J. The cause of the predominantly sinistral occurrence of thrombosis of the pelvic veins. *Angiology* 1957; 8 (5): 419–427. doi:10.1177/000331975700800505
- [11] 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* 1908; 135: 342–346
- [12] Ehrich WE, Krumbhaar EB. A frequent obstructive anomaly of the mouth of the left common iliac vein. *Am Heart J* 1943; 26: 737–750
- [13] Mitsuoka H, Ohta T, Hayashi S et al. Histological study on the left common iliac vein spur. *Ann Vasc Dis* 2014; 7 (3): 261–265. doi:10.3400/avd.oa.14-00082
- [14] Cockett FB, Thomas ML. The iliac compression syndrome. *Br J Surg* 1965; 52 (10): 816–821. doi:10.1002/bjs.1800521028
- [15] Murphy EH, Davis CM, Journeycake JM et al. Symptomatic ileofemoral DVT after onset of oral contraceptive use in women with previously undiagnosed May-Thurner Syndrome. *J Vasc Surg* 2009; 49 (3): 697–703. doi:10.1016/j.jvs.2008.10.002
- [16] Labropoulos N, Borge M, Pierce K et al. Criteria for defining significant central vein stenosis with duplex ultrasound. *J Vasc Surg* 2007; 46 (1): 101–107. doi:10.1016/j.jvs.2007.02.062
- [17] Oğuzkurt L, Ozkan U, Tercan F et al. Ultrasonographic diagnosis of iliac vein compression (May-Thurner) syndrome. *Diagn Interv Radiol* 2007; 13 (3): 152–155
- [18] Sang HF, Li JH, Du XL et al. Diagnosis and endovascular treatment of iliac venous compression syndrome. *Phlebology* 2019; 34 (1): 40–51. doi:10.1177/0268355518764989
- [19] Labropoulos N, Jasinski PT, Adrahtas D et al. A standardized ultrasound approach to pelvic congestion syndrome. *Phlebology* 2017; 32 (9): 608–619. doi:10.1177/0268355516677135