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Abdominal Vascular Compression Syndromes

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Abstract: ***Vascular compression syndromes are a diverse group of pathologies that can remain asymptomatic in otherwise healthy individuals or present symptomatically with a spectrum of presentations. Abdominal vascular compressive syndromes include nutcracker syndrome, median arcuate ligament syndrome, May-Thurner syndrome, and superior mesenteric artery syndrome. A case of may thurner syndrome is discussed with subsequent description of other 4 vascular compression syndromes i.e. posterior nutcracker, median arcuate syndrome, anterior nutcracker and SMA syndrome.***

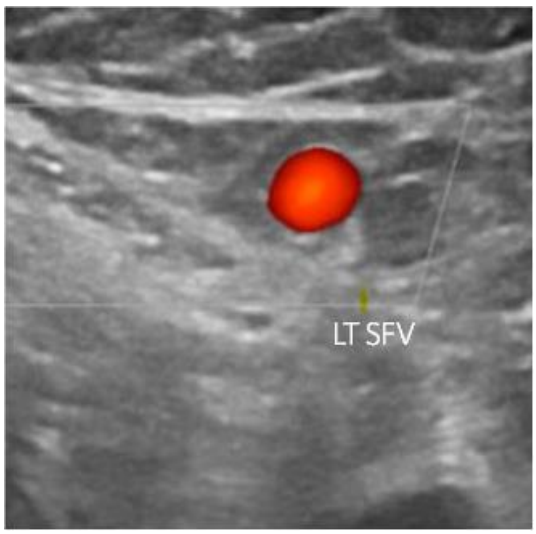
Keywords: vascular compression syndromes, nutcracker syndrome, median arcuate ligament syndrome, May-Thurner syndrome, superior mesenteric artery syndrome

1. Introduction

Abdominal vascular syndromes, although rare, are relevant because these syndromes have varied clinical presentations. Nevertheless, their imaging findings are characteristic and must be recognized by radiologists. Compressive vascular syndromes occur when abdomino-pelvic vessels are either compressed or cause compression of adjacent of adjacent anatomical structures. Compression can lead to ischemia and thrombosis in a young individual.

2. Case Report

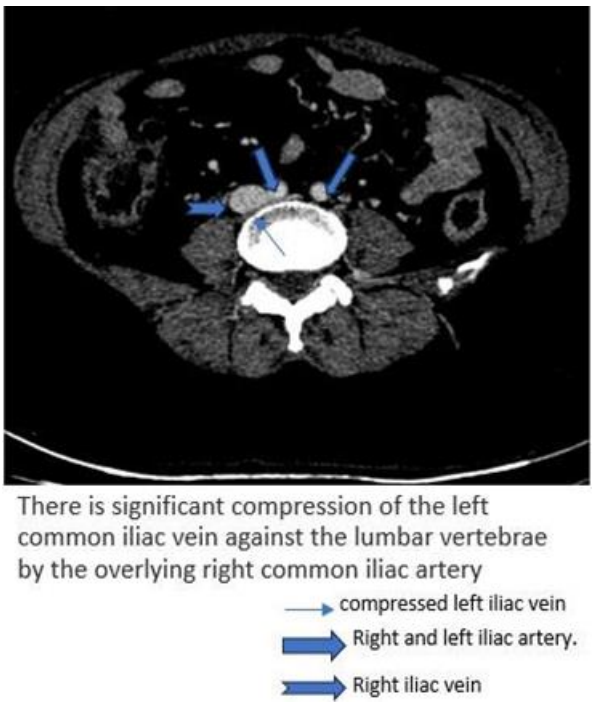
40 Years old female presented with complaints of pain and swelling in left lower limb with ulceration over the left leg. On clinical examination there was evidence of varicosities. The patient's Well's score for DVT was three points due to leg swelling, varicosities and tenderness. Peripheral venous doppler was advised and it revealed acute DVT in the left lower extremity, extending from the groin to the ankle.



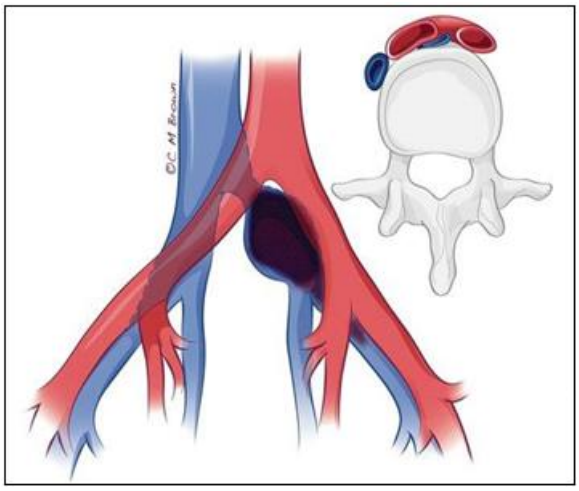
USG showing hypoechoic thrombus in the left SFV with no colour flow on doppler study.

CT pulmonary angiogram was performed and was negative for pulmonary embolism. Further Triple phase CT abdomen was performed for further evaluation.

CT abdomen findings



Multiple collaterals in left iliac and pelvic region



May and Thurner jointly first described this syndrome in which the left common iliac vein was compressed by the right common iliac artery against the lumbar vertebra.

3. Discussion

May-Thurner syndrome remains asymptomatic in most patients. Multiple cadaveric studies have demonstrated a much higher prevalence than is accounted for by symptomatic patients. With timely diagnosis of symptomatic patients and alleviation of mechanical compression, most patients with May- Thurner syndrome can maintain a high quality of life. It is important to continue intermittent surveillance to address symptom progression. Close clinical follow-up is recommended to mitigate thrombotic recurrence and optimize quality of life.

Post thrombotic syndrome is a common complication of symptomatic May-Thurner syndrome; the rate of post thrombotic syndrome can be reduced to less than 10% with comprehensive therapeutic interventions. Post-thrombotic syndrome is a complication of DVT of any etiology and is marked by chronic pain, edema, and ulceration of the affected limb. Risk factors for post thrombotic syndrome include an extensive thrombotic burden, residual thrombus following thrombolysis, obesity, and thrombus recurrence. Mechanical or pharmacological thrombolysis may reduce the risk of post thrombotic syndrome; patients may benefit from knee- or thigh-high compression stockings in addition to a prescribed exercise regimen

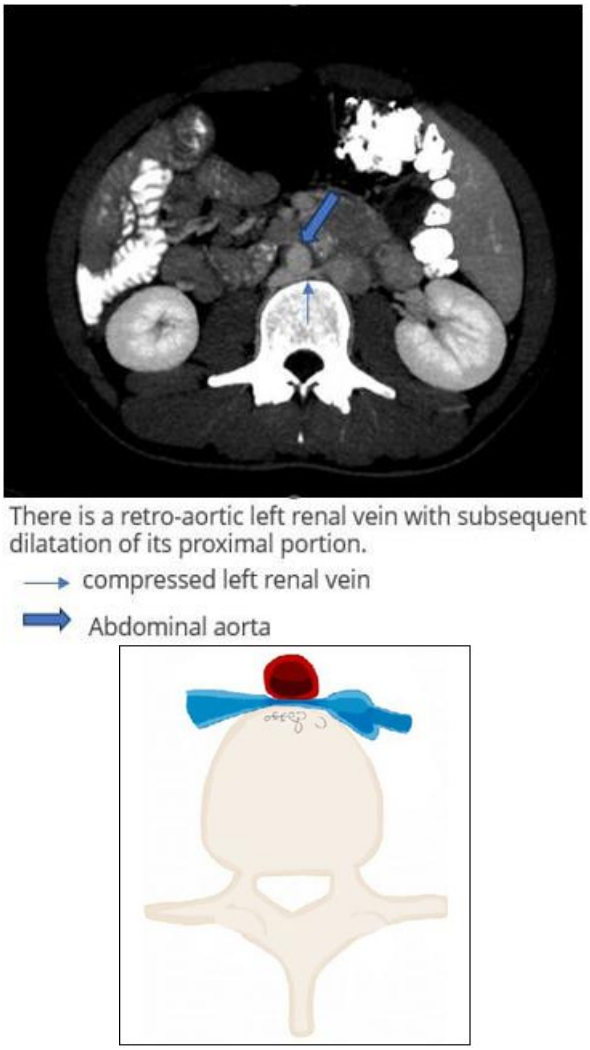
The symptoms of May-Thurner syndrome may be subtle until they are quite advanced. Thrombotic events often occur coincident with the development of a prothrombotic risk factor such as stasis, endothelial injury, or pregnancy. The prompt initiation of anticoagulant therapy minimizes the risk of postthrombotic syndrome, the risk of which is significantly increased by residual thrombus following thrombolysis and stenting.

Posterior Nutcracker syndrome

Refers to the compression of the left renal vein (LRV) by the abdominal aorta and the vertebral body.

This is an incidental finding during routine imaging studies and is known as nutcracker phenomenon due to the lack of symptoms. It can clinically manifest with intermittent hematuria, gonadal or spermatic reflux resulting in varicocele.

The presence of vertebral osteophytosis requires long-term follow-up of the LRV in order to detect increase of stenosis and complications



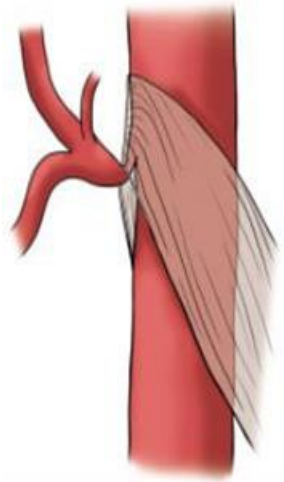
Pictorial representation of compression of left renal vein between aorta and vertebral body

Median arcuate ligament syndrome

Median arcuate ligament syndrome (MALS), also called "Dunbar syndrome", represent a condition characterized by external compression of celiac artery root by the median arcuate ligament (Fig. 1). This latter is a fibrous arch connecting the right and left diaphragmatic crura on either side of aortic hiatus.

The patient remains asymptomatic 85% of cases, however some present with epigastric pain and weight loss.

Figure 1: A 65-year-old man with median arcuate ligament compressing the celiac artery. **a** Sagittal CT image shows the "hooked appearance" (arrow) with severe stenosis at the origin of the celiac artery, in the absence of atherosclerotic plaques.



Pictorial representation of lower MAL position and celiac artery compression by the MAL

Superior mesenteric artery syndrome

A 20 years old male came to the OPD with complaints of history of recent weight loss with abdominal pain, CECT abdomen was performed and it revealed compression of the D2 segment between aorta and SMA.

On CT, the two key signs of SMA syndrome are an aortomesenteric angle of less than 22° (Fig. 4 A) and an aortomesenteric distance of less than 8 mm. The former sign has a sensitivity of 42.8% and specificity of 100% for SMA syndrome, whereas the sensitivity and specificity of the latter are 100%. The normal aortomesenteric distance is typically between 10 and 28 mm and is measured at the level of the duodenum as it travels between the aorta and SMA (Fig. 4B). Ancillary features include a dilated stomach and duodenum up to the aortomesenteric space followed by a sharp narrowing as the duodenum travels underneath the SMA

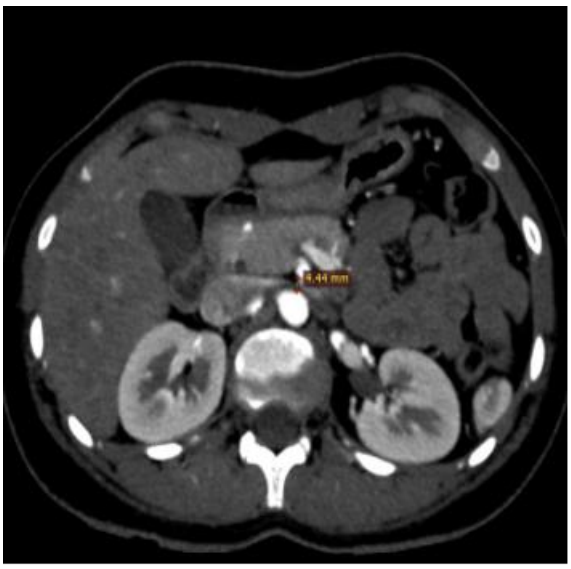
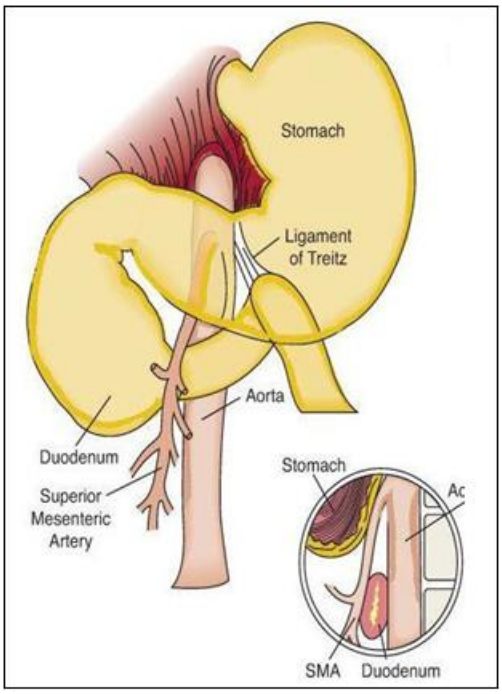


Figure 4A: Decreased distance between aorta and SMA

Figure 4B: Aortomesentric angle measures 20.8 degree.
Dilated D2 segment of duodenum



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