Surgical Concepts to Treat the (Lateral) Marginal Vein of the Lower Extremity

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Marginal Vein (MV) is one of 'truncular' VM lesions following defective development along the 'lateral' stage of embryogenesis while the vein trunk is formed. Since the majority of MV locates very superficially close to the skin with a minimal soft tissue coverage mimicking the varicose veins, most of the MV looks very innocuous, confusing the clinicians with ordinary varicose vein.

But MV is NOT an ordinary varicose vein although MV certainly looks like a varicose vein. MV is an embryonic tissue remnant, remained through the birth when the embryonic vein failed to make a normal involution to disappear before birth.

MV, as a ‘truncular’ VM lesion, has a defective vessel wall structure with lack of media/smooth muscle cell layer so that it carries a high risk of intravascular thrombosis resulting in VTE (venous thrombo-embolism). Hence, MV remains a serious condition as a potential killer (e.g. fatal pulmonary embolism), especially when MV accompanies with the consumptive coagulopathy.

Besides, MV accompanies a unique condition of congenital absence/lack of venous valves known as the avavulosis/avalvula to allow a severe reflux resulting in chronic venous hypertension/stasis with subsequent CVI (chronic venous insufficiency) and PTS (post-thrombotic syndrome).

Hence, MV accompanies much more serious hemodynamic consequences (cf. extratruncular lesions) although MV as a truncular lesion no longer possesses mesenchymal cell/angioblast characteristics to grow.
MV often accompanies/coexists with other truncular VM lesions as the outcome of immature/incomplete/abnormal development of the main axial veins.

- They present various conditions of defective vessel: aplasia, hypoplasia, or hyperplasia of the vessel (e.g. rudimentary femoral vein/agenesis) to cause an obstruction (e.g. vein web, spur, annulus, or septum) or dilatation (e.g. popliteal or iliac vein ectasia/aneurysm).
- When MV is combined with other VM lesions, its hemodynamic impact is further augmented.

Although MV seldom exists alone as an independent VM, its majority present as one of VM components of Klippel-Trenaunay syndrome (KTS) or Parkes-Weber syndrome (PWS), together with other truncular VM like femoral vein aplasia and/or iliac vein aplasia and infrequently with extratruncular VM lesion in addition.

MV is therefore, the most dangerous VM lesion as a leading CVM lesion component of KTS or PWS.

MV is invariably indicated for the intervention often with surgical excision since it causes various extents of acute as well as chronic complications including potentially fatal PE.

- But, the ablation of the MV is totally depending on the status of deep vein system; it can be done safely only when the deep system is in normal condition to tolerate sudden increase of the venous influx following the obliteration of MV.
- Due to its extremely superficial location beneath the skin, the endovascular obliteration using the laser or radiofrequency is seldom technically applicable.
- And the foam therapy is also very difficult due to extensive branches/collateral networks and subsequently faster and larger venous flow through the MV. Perforators in particular are difficult to control/close and risky with this foam therapy because of potential extension of thrombosis to the deep vein system with no barrier.

Hence, the surgical excision remains sole option to the majority of MV at best. And the role/indication of endovascular ablation and/or foam sclerotherapy have been so far very limited with few indications for the management of MV.

Marginal vein (MV) is NOT an ordinary varicose vein; it is an embryonic vein, classified as a venous malformation (VM).

- As a truncular VM, MV accompanies a high risk of venous thromboembolism due to defective vessel structure with a lack of smooth muscle cell to form the media in addition to avascular condition (e.g. fatal pulmonary embolism).
- Early ablation of the MV is indicated whenever feasible as far as the deep vein system is normal, especially when the MV causes a vascular bone syndrome. Otherwise, prophylactic anticoagulation is strongly recommended.
Thank you for your attention!