Thanks to the CHIVA strategy, may the histoarchitecture of great saphenous vein-sparing, make it suitable as graft for bypasses?

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The autologous vein graft has a better primary patency rate than PTFE, HUV or Dacron for above-knee bypasses.[1] The conclusion that the autologous saphenous vein is the material of choice for femoropopliteal bypass below the knee is generally accepted.[2] Results show that, despite the national trend toward endovascular intervention as the first-line treatment for claudication, the surgical bypass remains an effective and durable option for patients with low postoperative morbidity and mortality.[3] The vein graft shows a quick arterialization: the vein graft appears thicker than the normal great saphenous vein due to an increase in smooth muscle cells in the media muscular layer. In addition, the great saphenous vein is useful and a widely used graft for coronary bypasses. Particularly 2 studies show that no touch technique of saphenous vein harvesting provides significantly higher patency than the conventional technique.[4,5] Finally, following CHIVA saphenous sparing surgery, inflammatory cytokines were significantly reduced, indicating a possible restitution ad integrum as rationale to use also the preserved GSV as a graft material.[6] But are the spared great saphenous veins, thanks to the CHIVA strategy, really a suitable graft for bypasses?

In 22 patient that needed a hydrostatic column fractionation one year after saphenous femoral disconnection (CHIVA 1 strategy), a histological examination of a short segment of GSV had been performed, in 2 cases at the thigh level and in the remaining 20 cases in the leg. The diameter of the interrupted GSV varied from 3 to 6 mm.

In 21 cases the histoarchitecture of the vein was perfectly maintained with an intact endothelial layer, a well-represented medium layer with three different smooth muscular layers with only mild hypertrophy and hyperplasia, vessel in the medium layer to feed the muscular cells, and finally an adventitial layer whit nerves and vessel with multiple endothelial cells surrounded by muscular smooth cells. The B-mode examination in all these veins showed a regular venous appearance (Figures 1-3).

Only in 1 case the histological specimen showed a histological structure deterioration, compatible with the segmental venous enlarged aspect showed by ultrasound.

The histological specimen showed a perfect histological vein structure in all the veins with a normal B-mode appearance, better than a normal GSV as a consequence of the increase level of the internal pressure before the CHIVA treatment, similar to the well-known arterialization of a vein graft.

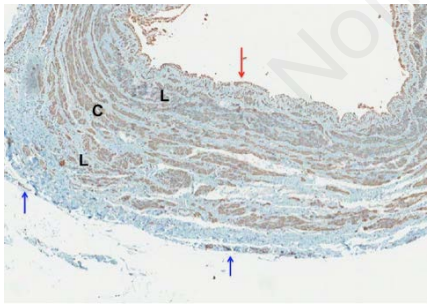

Figure 1. Leg GSV: Actina smooth muscle cells antibody staining techique (SMA). General view of the GSV wall. Perfect wall structure without any degenerative appearance. Normal aspect of the endothelial layer (red arrow). Smooth muscular cells in brown in the media layer: longitudinal fibers (L), circular fibers (C). The mild muscular hypertophy and hyperplasia may help this veins if used for an arterial bypass. Muscular fibre in the vasa venarum of the adventitial layer (blue arrows).

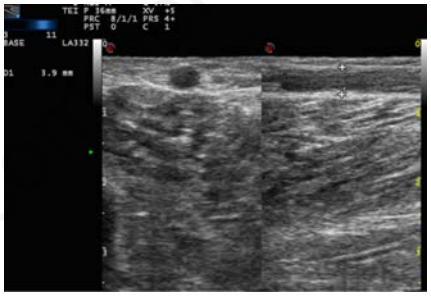

Figure 2. B-mode image of a preserved leg GSV thanks to the CHIVA strategy. Normal B-mode appearance of the GSV.

Figure 3. Regular B-mode appearance of a thigh GSV preserved thanks to the CHIVA strategy.

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References

1. Twine CP, McLain AD. Choice of bypass graft material for lower limb arterial bypasses. Cochrane Database of Systematic Reviews 2010;5:CD001487.
2. Klinkert P. Vein versus polytetrafluoroetylene in above knee bypass grafting: five years follow up. J Vasc Surg 2003;31:149-55.
3. Siracuse JJ. Results of primary bypass versus primary angioplasty/stent fort intermittent claudication due to superficial femoral artery occlusive disease. J Vasc Surg 2012;55:1001-7.
4. Franceschi C, Zamboni P. Principles of venous haemodinamics. New York, NY: Nova Science; 2008.
5. Franceschi C, Ermini S. The evaluation of essential elements defining varicose vein mapping. Veins and Lymphatics 2014;3:4922.
6. Zamboni P, Spath P, Tisato V, et al Oscillatory flow suppression improves inflammation in chronic venous dis-

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