Conference discussion

Dr. F. Beyersdorf (Freiburg, Germany): I think that you describe a potential solution to a clinically relevant problem, i.e. the unknown quality and anatomy of the long saphenous vein before harvesting this conduit for coronary artery bypass grafting. You have assessed the usefulness of pre-operative long saphenous vein mapping and assessment by venous Doppler ultrasound, and the prospective randomized control trial in your 61 patients revealed clear and probably expected results. You report that the size and anatomical distribution can be well predicted by the ultrasound study, and the mean length of the wound incision per vein graft performed was significantly less in the mapped group. This again correlated with a shorter time for vein harvesting per length of vein graft needed. And also expectedly there were less wound complications in the mapped group. So, this is a well performed study dealing with an important clinical entity, and I have three questions for you.

1. Can you give us some data about the time and personnel needed for routine assessment and mapping by the venous Doppler ultrasound?
2. What is the percentage of inappropriate prediction of size, quality and anatomy despite the ultrasound assessment?
3. In our center as well as in others, minimally invasive endoscopic harvesting of the vein is routinely done. Do you have some information about the usefulness of venous Doppler ultrasound when minimally invasive harvest- ing of the vein is routinely performed?

Mr. Luckraz: First of all, it takes about 10 min to actually do the mapping. Initially the mapping was done by Dr. Pugh, who is our venous ultrasonog- rapher consultant, but I actually myself went down and actually learned the technique off him, and that is why we are planning to move to an intraoperative more or less mapping in the anesthetic room. It is a technique that is not very difficult to learn. Obviously you have, with everything else in surgery, a learning curve, but it is easily learned by anybody who is involved with assessing the veins.

In terms of the anatomy, I have to say wherever the line was, that is where we found the vein. The size, there was a slight discrepancy, and that size discrepancy was accentuated if the vein when it was mapped was of a big caliber. I am not too sure what sort of technique you use to dilate your vein, but we just use gentle pressure, and we found that if the vein was above 6 mm in diameter, when you dilate it you will get a vein of about 8 mm in diameter, which is quite a significant size.

And finally in terms of looking at endoscopic harvesting, I think it would be a very good way, because if you know exactly where the vein is running, because this study and from our previous experience with the mapping, we know that the anatomy will be as predicted by the Doppler ultrasound. If the hemodynamic status of the venous systems are properly identified, an appropriate treatment plan (even harvesting) can be chosen. Radical surgery, such as [LSV] harvesting for coronary artery bypass surgery (CABG), defined as physical extraction of the LSV with ligation of all its collaterals and all the eventually existed enlarged varices, which has been the surgical procedure of choice for varicose veins for almost a century, has been replaced by a radical hemodynamic approach, meaning elimination of the hemodynamic defects at the root of the formation of the recurrences (the reflux). Duplex ultrasonography has become the method of choice to investigate morphology and hemodynamic properties of vein systems. However as has been shown previously, competent venous valves make the method reliable only in proximal vein segments with just one competent valve above the area investigated. The proximal leg veins are circular in the supine position during normal breathing as well as during a Valsalva manoeu-vre [3] and the diameter in transverse section corresponds well to the assessed in the sagittal plane. As a consequence, venous diameters measured in the supine position are reliable parameters for the assessment of the vessel area. Further investigations should also address the issue of distensi- bility measurements in more distally located vein segments. The different behavior of wall sections at different distances from the valve leaflet origin might give us further insights in the pathophysiology of LSV. Changes of the biophysical properties of the venous wall (elastic fibre degradation) may be the reason for increased distensibility (recurrences).

It would be interesting to quantify the ultrastructural changes of the vein wall and relate this to the impaired wall motion. The investigation of venous wall distensibility could also be a tool for follow-up measurements of wall remodeling processes (recurrences).

References