The role of the extra-anatomic bypass in the management of lower limb ischemia

Abstract

After a small introduction about vascular knowledge and it’s growth along history, the thesis can be divided in two parts: the general and the special one. The general part consists of four chapters which unite under the theme of basic considerations for clinical practice regarding the management of selected patients for extra-anatomic bypasses (EAB).

The first chapter deals with arterial diseases (basic considerations), being under-divided in another small chapters dealing with:

- Atherosclerosis as the main arterial disease affecting most of the peripheral arterial disease (PAD) patients, including the candidates for extra-anatomic bypasses
- Essential hemodynamic principles
- Basic vascular surgical techniques

The second chapter deals with establishing the surgical indication (the results and effects of surgical indication and patient characteristics on results) for EAB.

The third chapter deals with the risk scoring systems used in the multidisciplinary decision of EAB.

The last chapter of the general part deals with EAB techniques and graft configurations.

The special part reflects the personal contribution to this thesis. It is compound of 7 chapters which unite under the theme of demonstrating our center’s experience and my personal experience with the particularities, both hemodynamic and clinic, of these grafts, and the way they perform, both experimental and followed in our patients.

The first chapter of the special part is a comparison between the hemodynamic performances of different types of EAB. A part of our contribution in this field of comparing the hemodynamics of EAB is the assay of assessing the hemodynamic significance of angiographically detected stenoses using a physiologic test to predict how a potential donor iliac system would behave under the stress of supporting two legs instead of just one. We used Papaverine and directly measured femoral artery pressure at rest and after administration of this potent vasodilator.

The second chapter consists of the experimental study we performed on rabbits, regarding different anastomotic angles and their behaviour, after an induced acute ischemia of one paw. The acute ischemia experimental model was the ligation of an iliac artery. We imagined an experimental model of EAB, beside the femoro-femoral. We performed an ilio-iliac bypass using different angles, as we used also in the femoro-femoral model. The graft we used was another rabbit’s aorta, harvested from euthanised rabbits suffering from an experimental induced pathology (acute pancreatitis), prepared with ligation of the collaterals and washed thoroughly, then kept in the refrigerator in saline solution for less then 24 hours.

The third chapter deals with implementation in general practice of risk scoring systems we talked about in the third chapter of the general part of the thesis, in order to reduce the
subjectivity of an extra-anatomic procedure decision and contribute to the overall lowering of the global mortality of the PAD (peripheral arterial disease) patients. Specialized cardiac testing is expensive and can inadvertently delay important noncardiac surgery. It should be reserved for patients in whom clinical assessment alone gives insufficient reassurance, like, for example, the ones being at intermediate risk. Their routine use is based on a strong surgical-anaesthesiological-cardiological cooperation.

The fourth chapter deals with vascular graft infections management. Despite antibiotic prophylaxis and the development of more refined surgical techniques, microbial infection of the vascular prostheses are well known, not rare and reducible complications. Infection involving a vascular graft is difficult to eradicate. If not recognized or treated promptly, implant failure will occur by producing sepsis, hemorrhage or thrombosis. Management involves graft excision alone, graft preservation within the implant wound, in situ graft replacement or graft excision in conjunction with extra-anatomic bypass grafting. We performed all of these techniques in our patients, except in situ graft replacement, which is usually done using Rifampicin-impregnated prostheses.

The fifth chapter is represented by the statistical findings, based on following specific patient characteristics, the grafts patencies and the impact of surgical indications, degree of ischemia of the leg and some other variables on patencies. Discussions and Conclusions follow as the two next chapters and this thesis finishes with the references, which are quoted all over it.