

Myocardial Revascularization without Extracorporeal Circulation

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The myocardial revascularization without extracorporeal circulation (ECC) is not new, and the first reports of consecutive series date back from the beginning of the 80's¹⁻⁵.

Due to the comfort of performing saphenous-coronary anastomoses in cardioplegia, cardiovascular surgeons did not accept this alternative initially, even considering that the coronary approach is achieved on the heart surface, which would not require cardiac arrest in extracorporeal circulation.

After a long period of skepticism, there was an extraordinary and increasing interest in the mid-90's for this revascularization alternative, with the appearance of the "minimal invasion" concepts⁶.

The main points for such acceptance to occur were the introduction of stabilizers, the recognition of less morbidity and mortality, especially for high-risk patients, and the consistent results observed in the original series.

With the increase of experience in other centers, it was observed that the myocardial revascularization could be complete and show superior results when compared to the conventional technique.

In the registry of the Society of Thoracic Surgeons (STS), the revascularization without ECC (off-pump) offers better results than the conventional technique regarding mortality and morbidity, and these data have been confirmed in other literature studies⁷⁻¹⁰.

If the differences are not significant for low-risk patients, the difference in post-operative complications is noteworthy for those with important co-morbidities.

Among other advantages, it is worth mentioning the possibility of extubation in the operating room, shorter Intensive Care Unit (ICU) and hospital stay, decreased need for blood transfusion and advantages regarding hospital costs.

Among the debatable points it is worth mentioning

the decrease of the inflammatory response, of apoptosis, and the quality of the anastomoses.

The preferential candidates to revascularization without ECC are elderly patients with previous stroke; chronic obstructive pulmonary disease; chronic renal failure; carotid pathology; poor ventricular function; and aorta calcification¹²⁻¹⁴.

Initially, the technique was used solely for anterior descending coronary, right coronary and diagonal coronary lesions, but exposing the marginals with Lima stitches and the introduction of suction (Octopus®) or compression stabilizers (Guidant® - Millennium®), associated to a heart positioner (Starfish®) increased the indications and possibilities of revascularization without ECC.

The applicability has varied along the years, from sporadic indications to 100% for different surgical groups.

During 23 years of our experience, our total applicability was 21% in 3,727 cases, reaching 49% in the last five years.

The variations found in literature can be attributed to the surgeon's determination and training in the technique, to the concept of functional more than anatomical revascularization, and the demography of patients referred to surgery.

Nevertheless, there is no doubt that the anastomoses performed with the heart beating is not an indication for all patients, and much less for all surgeons. Only experience and training can assign the patients to either technique.

Finally, the revascularization without ECC, the use of arterial grafts and the surgical ventricular remodeling in ischemic cardiomyopathy are considered some of the greatest contributions of surgery to the treatment of coronary affections, and the comparisons of the medical percutaneous treatment with the surgical approach must be reconsidered in the light of such contributions.

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