

To Pump or Not To Pump

There have been many changes seen recently in cardiac surgery. Perhaps one of the most innovative is the upsurge in off-pump surgery for myocardial revascularization.

While practiced for many years in a limited fashion, the limited availability of extra-corporeal circulation (ECC) encouraged its increasing use [Buffolo 1985]. With the attention of cardiac surgeons and industry partners, a procedure that is becoming reproducible and teachable has resulted.

As our knowledge of the adverse effects of ECC advances, it is clear to many that avoidance is a major strategy. However, not all are convinced. The procedure of off-pump coronary bypass (OPCAB) must have the same (or better) outcomes in terms of long term graft survival, myocardial damage, and associated morbidity as does the classic operation done with a still, bloodless field on bypass. As the molecular events associated with ECC become more defined and, as importantly, those of myocardial ischaemia and reperfusion, so are the therapies that are available.

This supplement provides a broad spectrum of views on the inflammatory response, neurological damage, its possible causes, cost effectiveness of off-pump surgery and recent evidence regarding the anti-inflammatory actions of aprotinin.

Does the avoidance of cardiopulmonary bypass (CPB) eliminate the "inflammatory response"? Vassilios Guliemos compared four different approaches to surgical revascularization for single vessel disease. They concluded that thoracotomy was a major contributory factor leading to a rise in the inflammatory marker of Interleukin 1. Interestingly, all patients in each of the four groups examined (MIDCAB, OPCAB and median sternotomy with and without CPB) received aprotinin. This may have blunted the inflammatory response in what would generally be consid-



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ered a low risk group of patients [Guliemos 2000]. Michael Valley and his co-workers have reviewed their experience in this supplement and provide an interesting insight [Valley 2000].

David Taggart recently examined the results of OPCAB in a group of patients undergoing another study [Taggart 1999]. In reviewing the neuropsychological changes, he concluded there was no effect of CPB. John Murkin and others reviewed the possible mechanisms of central nervous system injury. After examining early results of a comparative trial of OPCAB and conventional CAB, they concluded that there was evidence for lower morbidity and less neuropsychological injury following OPCAB [Murkin 1999]. In looking at causes of brain injury (and equally other organ damage), David Stump questions whether OPCAB indeed prevents brain injury [Stump 2000].

In a preliminary report of a randomized study, Robert Baker and the group from Flinders University provide data on myocardial injury and early and mid term neuropsychological changes [Baker 2000].

James Hart presents his impressive series of OPCAB in the older age group [Hart 2000]. The cost effectiveness of OPCAB is examined by Victor Ferraris and Suellen Ferraris [Ferraris 2000].

Returning to the laboratory, Robert Landis and the team from the Hammersmith provide evidence of the mode of the anti-inflammatory action of aprotinin. Support for its anti-thrombotic properties is also presented [Landis 2000]. Inflammation is a constituent of myocardial damage and reperfusion injury associated with cardiac surgery. Santiago Endara reviews this area [Endara 2000].

A selected set of recent references relating to OPCAB and the inflammatory response of CPB completes this discourse.

Available on the CD is a graphic representation of the modulatory effect of aprotinin (Trasylol[®], Bayer Corporation, WestHaven CT) on the systemic inflammatory response.

The reader will ask the question "Does OPCAB reduce the incidence of the inflammatory response?" If there are other aetiological factors to this response apart from CPB, then is there a role for therapies such as aprotinin in OPCAB surgery? I believe there will be a role especially in the higher risk OPCAB patients. This may extend the role of OPCAB and make it even safer in many patients.

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