A Brief History of Emergency Intervention for Acute Myocardial Infarction

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Enhancements in the management of acute and chronic disease typically evolve over time. Sporadically, a quantum leap in the management of a malady can result in a significant improvement in outcomes. In 1876 Adam Hammer [1,2] postulated that a myocardial infarction was instigated by the interruption of blood flow into a coronary artery. Not with standing Hammer’s advice the management of unstable Coronary Artery Disease, (CAD) including Acute Myocardial Infarction (AMI), was traditionally managed conservatively with therapies designed to treat symptoms and sequelae, and not the cause. Symptomatic management alone resulted in an in-hospital AMI mortality between 15% to 30 % with survivors demonstrating significant residual morbidities, and late mortality. The modern era of cardiac surgery was ushered in with the development of the heart-lung machine [3-6]. The 1960’s and beyond saw great advances in coronary artery bypass surgery (CABG) [7-9]. These advances ushered in at first, the era of surgical management of chronic, stable CAD, followed by the surgical management of unstable CAD [10-12]. During the mid 1970’s, the conventional management for AMI made the quantum leap from treating symptoms and sequelae, to treating the cause [13,14]. The cause, first postulated by Hammer a century earlier, was confirmed in 1975, as the sudden occlusion of a coronary artery by a clot generated from a ruptured atherosclerotic plaque [15]. Reports published by Berg et al. [13] and this author demonstrated that rapid intervention with CABG resulted in a significant reduction in morbidity and mortality as compared to conventional management. Emergency reperfusion using CABG as a treatment of AMI reduced the in hospital mortality in my institution from approximately 29% to 1.3%, with a late mortality of 2.8% [14,15]. The value of emergency CABG to reintroduce blood flow into the MI vessel, salvages myocardium, improves myocardial function and permits the bypassing of other diseased coronary arteries. Though initially critiqued we and others continued treating AMI as an extreme emergency analogous to treating a gunshot wound of the abdomen or an aortic rupture [16-24]. The pre op emergency coronary angiogram typically demonstrated a total occlusion or a significant filling defect (clot) in the culprit coronary artery. At surgery, we routinely inserted a small balloon tipped catheter into that vessel to extract clot and frequently, atherosclerotic debris [15]. The revelation that clot, generated by a ruptured plaque, caused the MI, predated but paved the way for thrombolytic and percutaneous coronary intervention (PCI) therapies [25,26]. Emergency PCI [27] is to days accepted and preferred standard of care for the entire spectrum of CAD, including unstable CAD and AMI. PCI is one of the most commonly performed medical interventions. The concept of reperfusion is central to the modern treatment of CADs a general rule, the initial therapy for AMI is directed toward restoration of perfusion as soon as possible to salvage as much of the jeopardized myocardium as possible. This may be accomplished through mechanical means, such as PCI, or CABG surgery.

References


