

## Beating Heart Surgery—From Aortocoronary Bypass Surgery to Procedures on Valves

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In the year, 1880 it seemed impossible to operate on a heart—hence the well-known statement of the surgeon Billroth: “Any man who would attempt to operate on the heart should lose the esteem of his colleagues.” Today, however, it is possible not only to operate on a heart but to perform aortocoronary bypass grafts (CABG) without cardiopulmonary bypass (CPB), a procedure known as off-pump CABG (OPCAB). It is also possible to perform surgical procedures through small holes (minimally invasive direct CABG, or MIDCAB) even using computerized visualization and “robotic” instrument manipulation devices, and to perform valve surgery on the beating heart.

Changes in blood cardioplegia have been equally dramatic, evolving from pure cold crystalloid to warm blood cardioplegia.

Although surgery performed on an arrested cardioplegic heart with CPB is still the gold standard in cardiac surgery, the gold may be turning to silver as off-pump CABG surgery, without cardioplegia and CPB, becomes the procedure of choice in many circumstances.

Because there are now many techniques for addressing a single problem that have comparable outcomes, it is obvious that no single technique can be identified as the best or the worst. A choice of techniques is often primarily a matter of school, principle, and personal experience. Some surgeons continue to use the same techniques without change, ignoring the professional

literature claiming that one or another new technique is better than what they are using. They simply do not want to change anything, preferring stability over the lure of progress.

A wise man today would avoid such statements as: “Surgery of the heart has probably reached the limits set by nature to all surgery,” quoted in 1896. Observing the progression of cardiac surgical science from its starting point 50 years ago to its present state, we have been fortunate to witness the directions it went and the changes it made. This progress has been driven by the desire to perform operations better, faster, and with less risk, and to operate on patients with advanced stages of disease and achieve the same or comparable results as for patients with good function of the left ventricle. Although the steps were small, the progress was steady.

The presentation at the First International Symposium on Beating Heart Surgery, Belo Horizonte, MG, Brazil, on December 4, 1999, combined the experience of more than 6,000 patients operated upon by surgeons in centers throughout the world using the beating-heart, off-pump technique. The results presented at the symposium indicate that off-pump CABG is safe, reliable, and cost-effective, and it has become a procedure of choice for a selected number of cases.

I hope that by reading these lines, surgeons worldwide will be encouraged to step forward on the path of beating heart surgery.

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