



# The Surgical First Assistant

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## OPCRES: Off-Pump Coronary Revascularization with Endoscopic Saphenous vein harvesting

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*Simplification: (sim 'pli. fi. ca 'tion). (n) To make simple or simpler, (a) to reduce in complexity or extent.*

Redefining coronary surgery. Off-pump coronary artery bypass (OPCAB) and endoscopic vein harvesting (EVH). These procedures open up a new era in cardiac surgical care. One that applies new technologies to the challenge of coronary revascularization while acknowledging a new understanding of both the cause and effect of postsurgical neurologic complications. One that combines two clinically established procedures into a single, less invasive solution. The result is a brighter future for patients whose lives depend on it.<sup>1</sup>

### Off-pump coronary artery bypass

For more than 30 years, coronary artery bypass grafting (CABG with cardiopulmonary bypass) has been the gold standard in coronary revascularization. Although Kolessov performed CABG without cardiopulmonary bypass (CPB) in 1967,<sup>2</sup> it was only recently that this technique was revived. The advent of modern CPB technology and cardioplegic arrest overshadowed the important contribution of the Russian surgeon. The availability of CPB expanded the surgical therapy of coronary artery disease. Results in a larger series reported overall mortalities between 2%—4% in CABG.<sup>3,4</sup>

Morbidity has remained significant and probably increased as older patients with multiorgan disease have been accepted for CABG. But in spite of the many lives saved, CABG with CPB has

risks that have been well documented. They include incidence of stroke and postsurgical neurologic impairment. Compared with conventional CABG with CPB, off-pump CABG has reduced postoperative cognitive dysfunction by 36% at five days and 90% at three months. In addition, it has reduced transfusion rates by 48%, postoperative hospital length of stay by 40% and hospital cost by 24%.

Hemodynamics, both the patient's and surgeon's, is the first priority of OPCAB. This means minimizing the need for pressors or "permissive hypertension" and elaborate monitoring. It also requires exposure of all targets with less severe patient positioning. With the onset of new technologies available, the medical device companies have addressed products to enhance hemodynamic stability. As minimally invasive coronary revascularization adoption continues to grow, many aspects of technique and technology must advance in parallel in order for the advancement to continue. What was once acceptable has changed considerably with the experience of the cardiothoracic surgeons, as well as being driven by the competitive environment.

### Endoscopic vein harvesting

Despite the extensive use of arterial conduits to improve long-

term graft patency, most patients will still receive several saphenous vein bypass grafts. The saphenous vein grafts are used in more than 95% of all coronary artery bypass cases. Saphenous vein harvesting traditionally was performed through a longitudinal incision with the incision length equal to the length of conduit needed for bypass. This open technique, regardless of meticulous attention, can result in wound complications and has generally remained unchanged despite the associated morbidity. Depending upon the definition and severity of these complications, reports indicate that wound complications may occur in 20% to 40% of patients.<sup>5,6</sup>

A comparison was made of the continuous and bridging techniques (skip incisions with intact skin bridges). The open technique was associated with more severe infections that involved larger areas of the wound in comparison with the less-invasive bridging technique. Common leg-wound complications, which include cellulitis, lymphangitis, purulent drainage, wound breakdown with eschar formation, and fat necrosis have been reported and are commonly treated on an outpatient basis with oral antibiotics. However severe leg-wound complications may prolong a patient's hospital stay or require readmission for debridement, intravenous antibiotics and, in some cases, lower extremity revascularization for nonhealing wounds in ischemic limbs. Even when managed as an outpatient, ongoing pain from an open wound, the requirement for dressing changes and difficulty with ambulation can reduce the patient's quality of life.

Newer techniques using minimally invasive vein harvesting have been reported.<sup>7,8,9,10</sup> These initial reports show reduction in wound complications and excellent healing. In order for endoscopic saphenous vein harvesting to be generally accepted, it must not significantly prolong or delay the operation. Harvest times of at least 1.0 cm/min or better can be expected. This means the surgical team can expect to harvest two to three segments of vein in 30 to 45 minutes. Comparing total time for open harvesting and closure for the long incision, the time difference may be quite similar.

Because of the cost associated with the use of EVH, it may be important to focus on those patients who will benefit most from this technology. Cable and colleagues<sup>11</sup> reported no significant endothelial disruption with endoscopic harvesting. Endoscopic vein harvesting may minimize leg-wound complications, reduce pain, and improve patient satisfaction. It can be hypothesized that the use of an endoscopic technique will decrease the morbidity associated with saphenous vein harvesting in patients found to be at high risk for leg-wound complications, and there is evidence of fewer readmissions, antibiotics, office visits, wound care, and surgical procedures.

In conclusion, OPCRES combines the clinical benefits of both off-pump CABG and EVH. Together, they create a single revascularization procedure with far fewer occurrences of postsurgical scarring, wound healing complications, and neurological impairment. It is a new day for

cardiac surgery and a better day for cardiac patients.

## References

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## Save the date

AST has scheduled the fifth annual SFA Forum for September 21-23 in Nashville, Tennessee, at the DoubleTree Hotel Nashville. Additional information will be available in the *Journal* and on the AST web site: [www.ast.org](http://www.ast.org).

## Physicians Assisting Physicians in the OR

The American College of Surgeons' 1999 report titled "Physicians as Assistants at Surgery: 1999 Study" kicked off an ongoing discussion by the College defining the duties of the first assistant. A review of this study, produced in cooperation with 15 surgical organizations, shows reasonable practicality, leaving a majority of procedures open to various other roles.

The following is a sampling of the types of procedures for which surgeons "almost always" wanted other surgeons in the first assistant role:

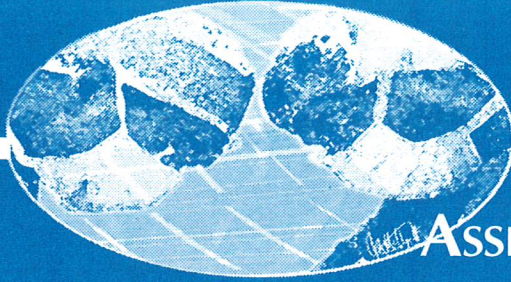
- Muscle, myocutaneous, fasciocutaneous flaps, flaps or transfers involving microvascular anastomosis; neurovascular flaps, bone grafts and autografts
- Various types of mastectomies and breast reconstructions, as well as Cesarean delivery, ectopic pregnancy, vulvectomy, vaginal hysterectomy
- Radical resection, retraction or excision of most tumors, cysts or infection
- Craniotomy, craniectomy
- Replantation surgeries
- Various genioplasties and osteotomies, facial augmentations, reconstruction or reduction surgeries and craniofacial separation, sinusotomy, laryngectomy, epiglottidectomy, ary-

tenoidectomy, and tracheoplasty

- bronchoplasty, thoracotomy, pneumonostomy, decortication, removal/ resection or transplant of lung, pericardectomy, aortic/artery repair, valvotomy, valve replacement or repair, coronary artery bypass, ventricle/septum repair, aortic grafts, shunts, heart transplant, and aneurysm/fistula repair
- Partial excision of vertebral bodies, osteotomy of the spine, open treatment/reduction of vertebral fractures/dislocations, arthrodesis, and kyphectomy, anterior and posterior fixation/instrumentation, spinal fusion
- Capsulorrhaphy, flexorplasty, arthrodesis, arthroplasties, and tenoplasty
- Diaphragmatic hernia repair, various lymphadenectomies, gastrectomy, enterectomy, enterorrhaphy, proctopexy, hepatectomy, choledochotomy, liver allotransplantation or hemorrhage, pancreatectomy, nephrolithotomy, ureterolithotomy, ureteropyelostomy, prostatotomy

The entire report by the ACS is available online at [www.facs.org](http://www.facs.org). Watch the *Journal* for articles about the impact on surgical technology and surgical first assisting.





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