

---

# Fast-track article

## Off-pump coronary artery bypass grafting without mechanical stabilization in minipericardiotomy: a preliminary experience

Pietro Di Biasi, Alessandra Di Mauro, Tiziano Torre, Maurizio Di Biasi\*,  
Francesco Donatelli

*Cardiothoracic Surgery Department, \*Cardiology Department, Policlinico Multimedica, Sesto San Giovanni (MI), Italy*

**Key words:**

Coronary artery  
bypass graft;  
Myocardial  
revascularization.

**We describe a new off-pump coronary bypass technique, the “double suspension-stabilization stitch”, performed without the support of mechanical stabilizers. This technique is very cheap and yields good hemodynamic stability, with no epicardial damage.**

(Ital Heart J 2004; 5 (12): 939-940)

© 2004 CEPI Srl

Received June 30, 2004;  
revision received  
November 15, 2004;  
accepted November 16,  
2004.

**Address:**

Dr. Pietro Di Biasi  
Dipartimento  
di Chirurgia Toracica  
Policlinico Multimedica  
Via Milanese, 300  
20099 Sesto San Giovanni (MI)  
E-mail: [pietro.dibiasi@multimedica.it](mailto:pietro.dibiasi@multimedica.it)

### Introduction

In recent years, technical advances in coronary artery exposure and mechanical stabilization have resulted in renewed interest for myocardial revascularization without cardiopulmonary bypass. Immobilization of the target coronary artery plays an important role in off-pump coronary artery bypass grafting. To date, stabilization of the coronary targets has been accomplished by using two categories of mechanical stabilizers: compression or suction stabilizers<sup>1</sup>.

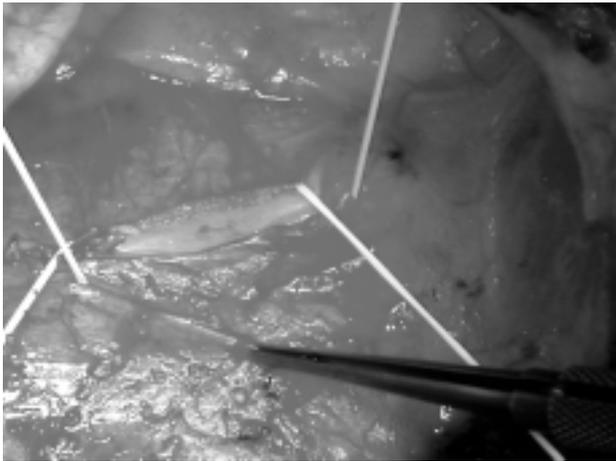
The aim of this report was to describe a new simple technique of exposure and stabilization of the left anterior descending coronary (LAD) and right coronary (RCA) arteries performed using only two pericardial-epicardial stay sutures, “the double suspension-stabilization stitch”, applied through a minipericardiotomy, without the need of any kind of mechanical stabilizers to perform coronary bypass.

### Methods

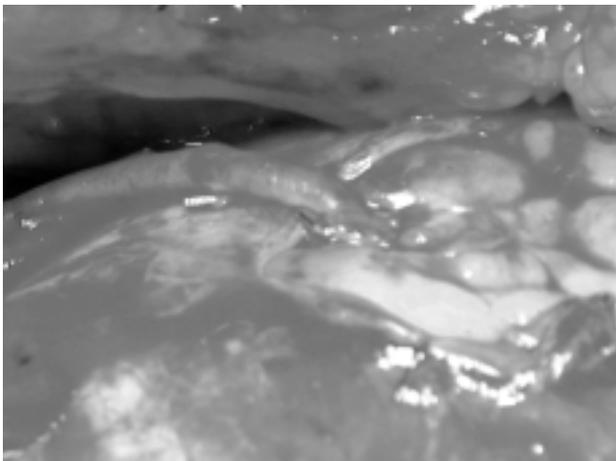
The cardiac function is monitored by means of transesophageal echocardiography and a Swan-Ganz right heart catheter. Sixteen patients with one- or two-vessel disease not suitable for coronary angioplasty were submitted to midline sternotomy. The pericardial fatty tissue overlying the LAD was then dissected. Usually, if the

artery is sclerotic, it is possible to identify its course by digital exploration of the pericardium. The course of the coronary artery may be identified directly through the pericardial sac after dissection of the pericardial fatty tissue. Otherwise, the LAD and RCA may be easily identified by digital exploration through a minimal pericardiotomy performed in proximity of the reflection of the diaphragm.

Careful localization of the target vessel is crucial because the technique is based on a minimal pericardiotomy (usually 2 cm) performed precisely over the site of anastomosis. An intravenous bolus of heparin (150 IU/kg body weight) is then administered. Stabilization of anastomotic site is achieved by means of vessel silicon loops with a blunt needle passed through the pericardial rims and around the coronary artery, with a double snare to achieve better stabilization. The same procedure is performed proximally and distally to the anastomotic site. Gentle traction is then applied on the silastic sutures and the site of anastomosis is stretched against the pericardium. This allows for maximal immobilization in all directions (x,y,z), with minimal impact on the cardiac function and hemodynamic stability (Fig. 1). Arteriotomy and anastomosis (left internal thoracic artery [LITA]-LAD), always with an intraluminal shunt too (Fig. 2), may be performed without having to resort to a stabilizer. The same procedure may be accomplished for grafting of the RCA with the right internal tho-



**Figure 1.** Stabilization of the site of anastomosis by means of vessel silastic loops passed through the pericardium, then around the coronary artery and finally again through the front of the rim of the minipericardiotomy. Gentle traction is applied on the silastic sutures.



**Figure 2.** Anastomosis between the left internal thoracic artery and the left anterior descending coronary artery: final view.

racic artery (RITA) through a minimal pericardiotomy performed just over the site of anastomosis. To date, a total of 24 coronary anastomoses (16 LITA-LAD and 8 RITA-RCA) have been performed in 16 patients.

## Discussion

The high-pressure load exerted by compression-type mechanical stabilizers may alter the hemodynamic stability and increase the distance from the site of anastomosis. Suction-type instruments are not burdened with these problems, but they create a vacuum that may cause epicardial damage mainly in older patients<sup>1</sup>. Moreover, both instrumentations increase the total cost of the procedure.

The “double suspension-stabilization stitch” is a simple technique which we have performed in a limited number of patients with one- or two-vessel (LAD and RCA) disease. It has proved to be safe and effective in accomplishing off-pump coronary grafting without the need of stabilizers. Immobilization of the site of coronary bypass anastomosis is guaranteed by stretching it against the pericardium, a stable anatomic structure. At short-term follow-up, all patients operated on were doing well. Angiography performed 1 month after surgery in all patients showed perfect patency of the LITA-LAD and RITA-RCA anastomoses. This technique presents several advantages: it abolishes the risks of circulatory instability or epicardial damage, reduces blood loss and surgical trauma owing to the minipericardiotomy, and finally it is cheap. The ideal case is represented by a LAD with a medialized course easy to expose via a limited anterior pericardiotomy or two-vessel disease with a right coronary stenosis before the crux cordis. Reinterventions are safe because the pericardial sac is completely closed in the midline. In our experience, the anastomotic time did not significantly differ from that employed when bypass is performed with mechanical stabilizers. In conclusion, the procedure is safe and cost-effective. This is a preliminary experience and so this original off-pump coronary bypass technique needs further validation.

## Reference

1. Konishi T, Higuchi K, Fukata M, Akisima S, Fukada S. Hybrid-type stabilizer for off-pump direct coronary artery bypass grafting. *Ann Thorac Surg* 1998; 66: 961-2.