Benetti MINI OPCABG System

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ABSTRACT

Keywords: MINI OPCAB, minimally coronary surgery, off pump coronary surgery, coronary surgery on the beating heart.

Professor Federico Benetti, from Argentina, is a pioneer of the revival of beating heart coronary surgery in the end seventies. He describes in this paper a new surgical technique and a new system to perform the MINI OPCABG operation, and expose his clinical experience on 6 cases.

RéSUMÉ

Mots clés : MINI OPCAB, chirurgie mini-invasive, chirurgie à cœur battant, chirurgie coronaire.

Le professeur Fédérico Benetti, d’Argentine, est un pionnier de la réintroduction de la chirurgie coronaire à cœur battant à la fin des années 1970. Il décrit dans cet article une nouvelle technique chirurgicale pour réaliser une chirurgie coronaire à cœur battant mini invasive, et présente son expérience clinique sur 6 cas.

1. INTRODUCTION

The majority of the worldwide Coronary surgery typically requires exposure of the heart and its vessels through median sternotomy, and cardiopulmonary bypass considered one of the most invasive and traumatic aspects of open-chest surgery. Trying to decrease the risks of the CABG and the costs in 1978 we have repopularized the Off Pump Coronary Artery Bypass Graft (OPCABG) and expand the technique, addressing lesions of the circumflex system (CX) and applying it to diverse clinical scenarios [1-2]. Were tested several surgical approaches, such as full sternotomy, including left, anterolateral, posterolateral and right anterolateral thoracotomies, as well as partial sternotomy [3].

The video-assisted techniques in the nineties allowed, for first time, to dissect the left internal thoracic artery (LITA) without opening the pleura cavity. The LITA was anastomosed to the left anterior descending (LAD) through a small left anterior thoracotomy [4-6]. From 1996, a new series of technological developments allowed, widespread application of the OPCABG and MIDCAB techniques [7], an allowed surgeons to perform high quality reproducible anastomoses and demonstrate in the great majority of reports, a decrease in postoperative morbidity [8-15].

In 1997, we perform for the first time an ambulatory coronary bypass through a xiphoid lower sternotomy incision (MINI OPCABG) using 3 D technology to assisted in the operation [16].

Here we described a new system to perform the MINI OPCABG operation.

2. MATERIALS AND METHODS

The population study consisted of 6 patients undergoing MINI OPCABG operation through a lower sternotomy incision, with the new system.

In this series, the patients were prepared as for standard coronary bypass cases. We administer anesthesia and heparinized to patients like a normal OPCABG, 3 mg/Kg of heparin maintain the Activated Coagulation Time (ACT) above 480 sec before cutting the mammary from the sternum.

We originally developed the technique in 1997 [16]. In that moment and all of these years we used standard retractors to take the left internal mammary artery and to perform the anastomosis with and without video assistance [22].

In these new system after the sternum was open up to the 3 or 4 intercostal space, the retractor is installed, and the left table of the sternum lifted around 2 to 3 cc depending each patients sternum characteristics, the retractor have in the horizontal part a mechanism that allow to lift a left or right blade without changing the retractor, after the mammary was taken as previous described [16], the anastomosis is performed using any type of stabilizer that is adapted to the system. The system creates a good space to perform the operation without difficulties [figure 1].

3. RESULTS

All patients receive anastomoses of the LITA to LAD (100%). 3 were females, the average age was 75 years. 3 (50%) have unstable angina and 3 (50%) stable angina. 3 (50%) had a previous infarction. 3 (50%) have triple vessels disease, 1 (16%) double vessels disease and 2 (33%) single vessels disease. 1 patient was operated of a vein graft to LAD 30 years before. The operative mortality was 0%, the morbidity was 0%. The average flow of the grafts was 58 cc/min and the PI 1.4 (Medisstim system). The average hospitalization stay in this series was 58 hours. At 9 months of average of follow up all the patients are alive and asymptomatic with clinical medication.

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4. DISCUSSION
The use of CABG, as compared with PCI, resulted in lower rates of major adverse cardiac events but more incidence of stroke due to the using of the pump and touching the aorta in the majority of the patients in this study [17]. As compared with the use of vein grafts alone, the use of an internal-thoracic-artery bypass graft was associated with a consistently better survival rate, regardless of age, sex and degree of stenosis [18].
This is an adequate system for patients requiring LITA to LAD with the possibility of early discharge and good initials results; and potentially for those who need more than LITA TO LAD in a minimally invasive approach and also for the patients that need multiple grafts is an option that avoid touching the aorta and using the pump [19].
Other advantage of this system is that you don’t need to open laterally the sternum. In addition, preserving the upper part of the sternum is important in case the patient will need a future intervention in the aortic valve [20]. Moreover, the virtues of robotic surgery must be compared with this system, in relation to cost - benefit for the patient [21].
More technological advances in the system will needed to help to overcome the anatomical difficulties in different patients.
RÉFÉRENCES