

Minimally Invasive Coronary Artery Bypass Grafting (MIS CABG)

Essay

*Submitted for Partial Fulfillment of MS Degree in
Cardiothoracic Surgery*

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2014

عمليات ترقيع الشرايين التاجية من خلال فتحة صغيرة بالصدر

رسالة

توطئة للحصول على درجة الماجستير في جراحة القلب والصدر

مقدمه من

طبيب / وائل مبخت يافس

بكالوريوس الطب والجراحة

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✍ To my father

✍ To my mother

✍ To my Sisters

✍ To my Lovely wife

I dedicate this work

✍ Wael Mobkhat Yafes



Acknowledgement

*First, th anks are all due to **GOD** for Blessing this work until it has reached its end, as a part of his generous help throughout our life.*

*My profound thanks and deep appreciation to **Prof. Dr. Tamer Mansour Ayed**, Professor of Cardiothoracic Surgery, and head of department at El-Galaa Family Military Hospital for his great support and advice, his valuable remarks that gave me the confidence and encouragement to fulfill this work, without whom I would have known nothing about minimal invasive cardiac surgery.*

*I am also grateful to **my lovely wife** hoping that I forever make you proud.*

*I would like to express my deepest gratitude and sincere appreciation to **my fighting Family** who brought me up this way despite all the hard circumstances.*



 **Wael Mobkhat Yafes**

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List of Abbreviations

BTT	: Blunt Tip Trocar
CABG	: Coronary Artery Bypass Grafting
COPD	: Chronic Obstructive Pulmonary Disease
CPB	: Cardio Pulmonary Bypass
CTA	: Computed Tomography Angiography
EAOBC	: EndoAortic Balloon Catheter
ENDOCAB	: Endoscopic Coronary Artery Bypass
EVH	: Endoscopic Vein Harvesting
FEV1	: Forced Expiratory Volume 1
HCR	: Hybrid Revascularization Room
ICS	: Inter Costal Space
IOTEE	: Intra Operative Trans Esophageal Echo
IJV	: Internal Jugular Vein
LAD	: Left Anterior Descending Artery
LAST	: Left Anterior Small Thoracotomy
LIMA	: Left Internal Mammary Artery
LSV	: Long Saphenous Vein
MACE	: Major Adverse Cardiac Events
MIDCAB	: Minimally Invasive Direct Coronary Artery Bypass
NIWHD	: Non Infective Wound Healing Disturbances
OCT	: Optical Coherence Tomography
ORAH	: Open Radial Artery Harvesting
OVH	: Open Vein Harvesting
PAC	: Pulmonary Artery Catheter

List of Abbreviations

PDA	: Posterior Descending Artery
PLS	: Partial Lower Sternotomy
RA	: Radial Artery
RCA	: Right Coronary Artery
STS ACSD	: Soceity of Thoracic Surgerons Adult Cardiac Surgery Database
TECAB	: Total Endoscopic Coronary Artery Bypass
TEE	: Trans Esophageal Echocardiography

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A Historical Perspective

After some isolated cases of direct myocardial revascularization performed by Goetz in 1961 and years later by Kolessov, myocardial revascularization was standardized by Favaloro and others using cardiopulmonary bypass and cardioplegic arrest. ⁽¹⁾

In 1975, Trapp and Bisarya published for the first time a consecutive series of 63 patients who were operated on without cardiopulmonary bypass. In this landmark paper, the authors presented the bases of beating-heart revascularization technique including a system to maintain myocardial perfusion with a perfusion catheter and some maneuvers to stabilize the heart to perform the distal anastomosis. At that time, it was considered dangerous and/or impossible to completely occlude the coronary artery without perioperative myocardial infarction. ⁽¹⁾

In 1981, Benetti and his group in Argentina, working independently, began the clinical application of beating-heart revascularization. These were the first reports describing coronary revascularization without cardiopulmonary bypass. ⁽¹⁾

A landmark event in the field occurred when Benetti proposed a small left thoracotomy to graft left internal thoracic artery to LAD artery, a technique that received the often confusing eponym MIDCAB, for minimally invasive direct coronary artery bypass. This procedure, widely applied and popularized by Calafiore, could be considered a natural evolution of the off pump technique, as it highlighted the minimal-access potential of coronary revascularization. ⁽¹⁾