

**Meta-analysis of comparative results
between minimal invasive and conventional
method of vein harvesting in Coronary
Artery Bypass Grafting**

A meta-analysis

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

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2018



Acknowledgment

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

*I find no words by which I can express my extreme thankfulness, deep appreciation and profound gratitude to my eminent **Prof. Dr. Mohammed El-Fiky** Professor of Cardiothoracic Surgery, Faculty of Medicine, Ain Shams University for giving me the privilege of working under his meticulous supervision and for his generous help, guidance, kind encouragement and great fruitful advice during supervision of this work.*

*I am deeply indebted to, **Prof Dr./ Yasser Al-Nahaas** Assistant prof of Cardiothoracic Surgery, Faculty of Medicine, Ain Shams University for his great support and careful supervision, which helped me to overcome many difficulties.*

*I am also grateful to **Prof Dr. Moustafa Gamal El-Din** Lecture of of Cardiothoracic Surgery, Faculty of Medicine, Ain Shams University, who freely gave his time, effort and experience along with continuous guidance throughout this work.*

Mohammed Ahmed Zedan

List of Contents

Title	Page
List of Abbervations.....	I
List of Tables.....	III
List of Figures.....	V
Introduction.....	1
Aim of the Work.....	3
Review of literature	
- Chapter (1): IHD & CABG).....	4
- Chapter (2): Minimally Invasive Open Method.....	29
- Chapter (3): Meta-analysis	
Patients and methods.....	69
Results.....	77
Discussion.....	109
Conclusion and Recommendations.....	128
Refernces.....	130
Arabic Summary	

List of Abbreviations

ACC	American College of Cardiology
ACS	Acute coronary syndrome
AHA	American Heart Association
bFGF	Basic fibroblast growth factor
CABG	Coronary-artery bypass grafting
CI	Confidence interval
CVD	Cardiovascular disease
Disease DB	Diseases Database
EDRFs	Endothelium – derived relaxing factors
EVH	Endoscopic vein harvesting
GSV	Great saphenous vein
IHD	Ischemic heart disease
IPT	Inferior posterior tibial
LAC	Left atrial circumflex
LCA	Left coronary artery
LDL	Low density lipoprotein
LMS	Left main stem
LSV	Long saphenous vein
LVS	Lateral venous system
MeSH	Medical Subject headings
MVH	Minimally invasive vein harvesting

NSTEMI	Non-ST segment elevation myocardial infarction
OR	Odds ratio
OVH	Open vein harvesting
PD	Posterior descending
PDGF	Platelet-derived growth factor
PVD	Peripheral vascular disease
PVs	Perforating veins
RAO	Right atrial branch;
RCA	Right coronary artery
SPT	Superior posterior tibial
SSV	Small saphenous vein
STEMI	ST-segment myocardial infarction
TOE	Transoesophageal echogram
TTE	Transthoracic echocardiogram
UK	United kingdom
USA	United states of America
VEGF/VPF	Vascular endothelial cell growth factor/ vascular permeability factor
VEGFA	Vascular endothelial growth factor A

List of Tables

Table. No	Title	Page
Table (1)	Classification codes of Ischemic Heart Disease	7
Table (2)	Risk factors for the development of Ischaemic Heart Disease.	13
Table (3)	Points scale used to calculate total ASEPSIS score	65
Table (4)	Points scale for ASEPSIS daily wound inspection	65
Table (5)	Breakdown of ASEPSIS scores	66
Table (6)	Score Category of infection	66
Table (7)	General characteristics of the randomized prospective studies included in the meta-analysis	79
Table (8)	Criteria used to assess methodologic quality	81
Table (9)	Assessment of the methodologic quality of randomized prospective studies included in the meta-analysis	82
Table (10)	Comparison of pooled demographics between MVH and OVH in the included studies for meta-analysis	84

Table. No	Title	Page
Table (11)	Comparison of pooled demographics between EVH and OVH in the included studies for meta-analysis	85
Table (12)	Types of minimally invasive techniques used for saphenous vein harvesting in the studies included for meta-analysis	91
Table (13)	Evaluated postoperative outcomes in the studies included for meta-analysis	92
Table (14)	Definition of leg wound infection in the included studies for meta-analysis	98
Table (15)	Comparison of pooled postoperative outcome between MVH and OVH in the included studies for meta-analysis	99
Table (16)	Comparison of pooled postoperative outcome between EVH and OVH in the included studies for meta-analysis	100

List of Figures

Figures. No	Title	Page
Figure (1)	Anterior view of the human heart with blood vessels identified.	5
Figure (2)	Coronary artery anatomy.	6
Figure (3)	Medium powered H&E histological micrograph of an intimal lesion (x200).	9
Figure (4)	Surface anatomy of great saphenous vein	30
Figure (5)	Completely open technique. The vein is exposed from the ankle up to the mid-thigh.	41
Figure (6)	Exposing the vein. The vein is exposed at the knee using self-retaining retractor and vessel loop.	48
Figure (7)	The tunnel of the vein. The vein in the center of the tunnel and the tunnel is kept using CO2 insufflation.	49
Figure (8)	Measuring the vein.	52
Figure (9)	Flow diagram of selection criteria of the randomized prospective studies included in the meta-analysis.	78

Figures. No	Title	Page
Figure (10)	Forest plot of leg wound infection between minimally invasive vein harvesting (MVH) and open vein harvesting (OVH)	101
Figure (11)	Forest plot of leg wound infection between endoscopic vein harvesting (EVH) and open vein harvesting (OVH)	101
Figure (12)	Forest plot of leg wound pain incidence between minimally invasive vein harvesting (MVH) and open vein harvesting (OVH).	102
Figure (13)	Forest plot of leg wound pain incidence between endoscopic vein harvesting (EVH) and open vein harvesting (OVH).	102
Figure (14)	Forest plot of graft occlusion between endoscopic vein harvesting (EVH) and open vein harvesting (OVH).	103
Figure (15)	Forest plot of graft stenosis between endoscopic vein harvesting (EVH) and open vein harvesting (OVH).	103

Figures. No	Title	Page
Figure (16)	Forest plot of harvest time between minimally invasive vein harvesting (MVH) and open vein harvesting (OVH)	104
Figure (17)	Forest plot of harvest time between endoscopic vein harvesting (EVH) and open vein harvesting (OVH)	104
Figure (18)	Forest plot of hospital stay between minimally invasive vein harvesting (MVH) and open vein harvesting (OVH)	105
Figure (19)	Forest plot of hospital stay between endoscopic vein harvesting (EVH) and open vein harvesting (OVH)	105
Figure (20)	Forest plot of the proportion of conversion of minimally invasive vein harvesting (MVH) to open vein harvesting (OVH)	106
Figure (21)	Forest plot of the proportion of conversion of endoscopic vein harvesting (EVH) to open vein harvesting (OVH)	106

Figures. No	Title	Page
Figure (22)	Funnel plot (Assessment of publication bias) for comparison between MVH and OVH.	107
Figure (23)	Funnel plot (Assessment of publication bias) for comparison between EVH and OVH.	108

Introduction

Conceptually, meta-analysis uses a statistical approach to combine the results from multiple studies in an effort to increase power (over individual studies) to improve estimates of the size of the effect and/or uncertainty when reports disagree. It is also most often used to assess the clinical effectiveness of healthcare intervention; it does this by combining data from two or more randomized control trials (*Walker et al., 2004*).

Coronary-artery bypass grafting (CABG) is one of the most commonly performed surgical procedures and improves the clinical outcomes in appropriately selected patients. Despite increased use of an arterial conduit, the greater saphenous vein remains the conduit that is used most often in CABG (*Bhuvaneswari et al., 2016*).

The choice of the graft conduit for coronary artery bypass grafting (CABG) has significant implications both in the short- and long-term. The potency of a coronary conduit is closely associated with an uneventful postoperative course, better long-term patient survival and superior freedom from re-intervention. However, long saphenous vein (LSV) continues to be utilized universally as patients presenting for CABG often have multiple

coronary territories requiring revascularization (*Heyman Luckraz et al., 2016*). Minimal invasive techniques such as endoscopic vein harvesting (EVH) have therefore been developed to reduce post-coronary artery bypass grafting (CABG) leg wound complication. Currently, EVH is the method of choice in many centers as it allows lower post-surgical complication rates compared to the conventional method (*Gianluigi et al., 2016*).

Traditionally, the saphenous vein is harvested under direct vision (open harvesting) with the help of linear incisions along the course of the vein. This approach is associated with discomfort and the risk of complications, including edema, hematoma, delayed healing, cellulitis, and wound dehiscence (*Sanjay et al., 2016*).

Aim of the work

The aim of this work to study efficiency, safety and complication of minimally invasive greater saphenous vein harvesting versus open method especially wound infection and vein graft failure.

Chapter 1

IHD & CABG

Development and anatomy of the coronary arteries

As with any organ, the heart requires its own supply of blood for continued functioning. The supply of blood to the myocardium occurs via the coronary artery circuit (**figure 2**). Their name is derived from the Latin ‘Corona’, meaning crown as the main vessels encircle the interventricular and atrioventricular grooves (*Kivimaki et al., 2012*).

The arterial tree has two main compartments; firstly, the main arteries (**table 1**) and ramifications on the surface of the myocardium, known as the extramural coronary system. Secondly, the branches of the surface vessels which penetrate deep into the myocardial tissues are known as the intramural coronary system (*Kivimaki et al., 2012*).

The extramural coronary system is formed from two main arteries. The left coronary artery (LCA) and the right coronary artery (RCA). A third vessel exists in up to 50% of the population and is known as the conus artery. The diameters of the vessels are given in **table 1**. The