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

A meta-analysis

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List of Abbervations

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

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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