

Impact of Stem Cell Therapy In Chronic Critical Lower Limb Ischemia

Thesis

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of *MD Degree of Cardiology*

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تأثير العلاج بواسطة الخلايا الجذعية في الشرايين الطرفية

توطئة للحصول على درجة الدكتوراة في القلب والأوعية الدموية

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List of Abbreviations

ABI	: Ankle-brachial index.
ACC	: American College of Cardiology
ACE	: Angiotensin-converting enzyme.
ACS	: Acute coronary syndromes.
AHA	: American Heart Association.
Apo C-III	: Apolipoprotein C-III.
CAPRIE	: Clopidogrel versus Aspirin in Patients at Risk of Ischemic Events.
CFA	: Common femoral artery.
CLEVER	: Claudication: Exercise Versus Endoluminal Revascularization.
CLI	: Critical limb ischemia
COPD	: Chronic obstructive pulmonary disease
CTA	: Computed tomographic angiography
DIC	: Disseminated intra vascular coagulopathy.
DNA	: Deoxyribonucleic acid.
DP	: Dorsalis pedis.
FDA	: Food and Drug Administration
HDL	: High-density lipoprotein
HMG	: Hydroxymethyl glutaryl.
IC	: Intermittent claudication.
ICAM-1	: Intercellular adhesion molecule-1
INR	: International normalized ratio
LDL	: Low-density lipoprotein
Lipoprotein (a)	: Lp [a]

List of Abbreviations (Cont.)

MI	:	Myocardial infarction
MRA	:	Magnetic resonance angiography.
NF- α	:	Tumor necrosis factor- α .
NF- κ B	:	Nuclear factor- κ B .
NO	:	Nitric oxide.
OR	:	Odds ratio.
Ox-LDL	:	Oxidized LDL.
P	:	Statistical significance
PAD	:	Peripheral arterial disease.
PAI-1	:	Plasminogen activator inhibitor-1.
PDGF	:	Platelet-derived growth factor.
PPAR- α	:	Peroxisome proliferator-activated receptor- α .
PT	:	Posterior tibial
PTA	:	Percutaneous trans-luminal angioplasty.
SFA	:	Superficial femoral artery.
SMC	:	Smooth muscle cells.
TASC	:	Trans Atlantic Inter-Society Consensus Working Group.
TGF- β	:	Transforming growth factor- β
TRLs	:	Triglyceride-rich lipoproteins.
VCAM-1	:	Vascular cell adhesion molecule-1.
VLDL	:	Very low density lipoprotein.

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Yasser Ahmed Sadek Ibrahem

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Introduction

Peripheral arterial disease (PAD) is one manifestation of systemic atherosclerosis. The prevalence of PAD increases with the age of the population.^{1,2} It is important to remember the significant association of coincident coronary artery disease and cerebro-vascular disease in these patients, because it represents the major cause of major morbidity and mortality in the PAD population.³ Remarkable technological advances in the past decade, along with patient preference, have shifted revascularization strategies from traditional open surgical approaches toward lower-morbidity percutaneous endovascular treatments. Catheter-based revascularization of the lower extremities was first performed by Charles Dotter⁴ and advanced by Andreas Gruentzig, who employed then newly developed inflatable balloon catheters that could dilate vascular stenosis.⁵

The availability of stents, more than any other advance, has fueled the growth of catheter-based procedures by improving the safety, durability, and predictability of percutaneous revascularization.

Endovascular therapy offers several distinct advantages over open surgical revascularization for selected lesions.^{6,7} It is performed with local anesthesia, which enables the treatment of patients who are at high risk for general anesthesia. The morbidity and mortality from catheter-based therapy is extremely low, especially compared with open surgical revascularization. After successful percutaneous revascularization, patients are ambulatory on the day of treatment, and unlike after vascular surgery, they can often return to normal activity within 24 to 48 hours of an uncomplicated procedure. Endovascular therapies generally do not preclude or alter subsequent surgery and may be repeated if necessary.