

**Short term major adverse cardiac events
after Percutaneous Coronary Intervention
with Tirofiban and thrombectomy Versus
Percutaneous Coronary Intervention with
Tirofiban alone in patients with Acute
Coronary Syndrome**

Thesis submitted for partial fulfillment of Master degree
in Cardiology

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مقارنة على المدى القصير بين المضاعفات القلبية الكبيرة ما
بعد شفط التجلط مع حقن المريض بعقار التيروفيبان أو
حقنه بالتيروفيبان فقط أثناء عملية القسطرة التداخلية
للشرايين التاجية في
مرضى القصور الحاد بالشرايين التاجية

رسالة توطئة

لإتمام الحصول على درجة الماجستير
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Short term major adverse cardiac events after Percutaneous Coronary Intervention with Tirofiban and thrombectomy Versus Percutaneous Coronary Intervention with Tirofiban alone in patients with Acute Coronary Syndrome

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Abstract:

Thrombus aspiration is an effective adjunctive therapy to prevent distal embolization during percutaneous coronary intervention (PCI) in patients having visible thrombus in their coronary angiography. In some patients, thrombus aspiration results in complete restoration of flow without significant residual stenosis or plaque rupture at the site of occlusion.

The goal of this trial was to evaluate a strategy of thrombus aspiration during percutaneous coronary intervention (PCI) in patients with ACS having visible thrombus in their coronary angiography (30 patients) compared with conventional PCI (30 patients)

60 patients with acute coronary syndromes {ST segment elevation myocardial infarction, non ST-segment elevation myocardial infarction and unstable angina} with angiographically visible thrombus constituted the study.

After history taking and physical examination all patients were subjected for ECG, full labs., echocardiography, and conventional medical therapy with upstream tirofiban infusion.

Then patients were randomized and divided into two groups:

* **1st group:** 30 patients managed by upstream Tirofiban followed by coronary angiography and PCI using the thrombus aspiration catheter (Diver Ce) & stenting.

* **2nd group:** another 30 patients managed by upstream Tirofiban followed by coronary angiography & stenting

Then patients were evaluated for the following end points:

TIMI flow, myocardial blush grade, angiographically visible embolization, any other complication, in hospital acute & sub-acute thrombosis, in hospital bleeding, MACE. Adverse cardiac events at one month.

On comparing 30 patients in each group having the same circumstances and almost the same percentage of risk factors, it was found that manual thrombus aspiration results in improved myocardial reperfusion as documented by improvements in TIMI flow, myocardial blush grade, and clinical outcome as compared with conventional PCI as distal embolization occurred in 6 patients (20%) in group 1 while in group 2 it occurred in 15 patients (50%)

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List of Abbreviations

Abb	The whole word
ACE	Angiotensin converting enzyme
ACS	Acute coronary syndrome
ACT	Activated clotting time
ADP	Adenosine di phosphate
AIDS	Acquired immunodeficiency syndrome
AMI	Acute myocardial infarction
AMP	Adenosine mono phosphate
ATP	Adenosine tri phosphate
AV	Atrio-ventricular
CABG	Coronary artery bypass grafting
CAD	Coronary artery disease
CBC	Complete blood count
CCS	Canadian Cardiovascular Society
CHF	Congestive heart failure
CK	Creatine kinase
CNS	Central nervous system
Cr.Cl	Creatinine clearance
CRP	C-reactive protein
CT	Computed tomography
DM	Diabetes mellitus
ECG	Electrocardiography
ED	Emergency department
EDCF	Endothelin derived contracting factor
EDD	End diastolic dimension
EDRF	Endothelial derived relaxing factor
EDV	End diastolic volume
EF	Ejection fraction
eg	Example
ESD	End systolic dimension
ESV	End systolic volume

ET-1	Endothelin – 1
GP	Glycoprotein
h	Hour
HDL	High density lipoprotein
HITT	Heparin induced thrombocytopenia.
HTN	Hypertension
IDDM	Insulin Dependent Diabetes Mellitus
IHD	Ischemic heart disease
IU	International unit
IV	Intra-venous
Kg	Kilogram
LAD	Left anterior descending artery
LBBB	Left bundle branch block
LCX	Left circumflex artery
LDL	Low density lipoprotein
LMWH	Low molecular weight heparin
LV	Left ventricle
MACE	Major adverse cardiac event
MBG	Myocardial blush grading
mcg	Microgram
mg	Milligram
MI	Myocardial infarction
min.	Minute
mm	Millimeter
MR	Mitral regurge
MRI	Magnetic resonance imaging
MVO ₂	Myocardial oxygen consumption
NIDDM	Non insulin dependent diabetes mellitus
NSTEMI	Non ST segment elevation myocardial infarction
OR	Odd ratio
PC	Prothrombin concentration
PCI	Percutaneous coronary intervention
PGI ₂	Prostaglandin I ₂
PO	Per Os (oral)
PT	Prothrombin time

PTCA	Percutaneous transluminal coronary angioplasty
PTT	Partial thromboplastin time
RCA	Right coronary artery
SL	Sublingual
SPECT	Single-photon emission computed tomography
STEMI	ST segment elevation myocardial infarction
STR	ST segment resolution
TG	Triglycerides
TIMI	Thrombolysis In Myocardial Infarction
TTP	Thrombotic thrombocytopenic purpura
TVR	Target vessel revascularization
UA	Unstable angina
UFH	Unfractionated heparin
VIP	Vaso-active intestinal peptide

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Introduction

The term acute coronary syndrome refers to a range of acute myocardial ischemic states. It encompasses unstable angina, non-ST segment elevation myocardial infarction (ST segment elevation generally absent), and ST segment elevation infarction (persistent ST segment elevation usually present).

The term "NSTEMI ACS" describes populations presenting with **acute** chest pain lasting >20 minutes and either positive cardiac markers or dynamic ST-segment changes on the initial ECG without persistent ST-segment elevation.^{1,2}

Acute coronary syndromes (ACS) accounted for 35% of all deaths among persons ≥ 65 years of age in the United States.³ Moreover, among people who died of ischemic heart disease, 83% were >65 years of age.⁴ Cardiovascular morbidity and mortality rates rise rapidly past 75 years of age, a group that accounts for only 6% of the US population but 60% of myocardial infarction (MI)-related deaths.⁵

Unstable angina and non-ST segment elevation myocardial infarction account for about 2.5 million hospital admissions worldwide and are a major cause of mortality and morbidity in Western countries.

Introduction

Angiographic evidence of coronary thrombus formation may be seen in more than 90% of patients with STEMI but in only 1% of patients with stable angina and about 35-75% of patients with unstable angina or NSTEMI. The excessive mortality rate of coronary heart disease is primarily due to rupture and thrombosis of the atherosclerotic plaque. Evidence indicates that platelets contribute to promoting plaque inflammation as well as thrombosis.

In general, in case of STEMI, a direct relationship between the onset of plaque rupture and acute transmural ischemia is assumed; however, autopsy studies investigating the pathogenesis of the "vulnerable plaque" in patients who had witnessed sudden cardiac death identified signs of old thrombosis, which indicates that plaque complications remain clinically silent days or weeks before the fatal event.^{7,8} . The presence of intracoronary **thrombus** and atheromatous plaque constituents may lead to distal embolization and the "no-reflow" phenomenon after percutaneous coronary intervention (PCI),⁹ both associated with poor clinical outcome.¹⁰⁻¹¹ Studies to date suggest that as a class, the addition of intravenous GP IIb/IIIa inhibitors to aspirin and heparin improves both early and late outcomes.

The concept of "no reflow" refers to a state of myocardial tissue hypoperfusion in the presence of a