

***Short-term Outcome of Manual Thrombus Aspiration
for Patients Undergoing Primary PCI for Acute STEMI
Showing Large Thrombus Burden***

Thesis

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List of Abbreviations

• ACC	American College of Cardiology
• ACAD	Atherosclerotic coronary artery disease
• ACS	Acute coronary syndrome
• AHA	American Heart Association
• ASA	Acetyl-Salicylic Acid
• AT	Aspiration thrombectomy
• CABG	Coronary artery bypass grafting
• CAD	Coronary artery disease
• CHF	Congestive heart failure
• CMR	Cardiac Magnetic Resonance
• CVD	Cardiovascular disease
• DAPT	Dual antiplatelet therapy
• DM	Diabetes mellitus
• DES	Drug-eluting stent
• D1	First diagonal branch
• DBT	Door to balloon time
• DEAR-MI	Dethrombosis to enhance acute reperfusion in MI
• ECG	Electrocardiogram
• EXPIRA	Thrombectomy with Export catheter in infarct – related artery during primary PCI
• FMC	First Medical Contact
• GPII b/IIIa	Glycoprotein IIb/IIIa inhibitor
• GRACE	Global Registry of Acute Coronary Events
• HDL	High Density Lipoprotein
• HORIZONS-AMI	Bivalirudin during primary PCI in AMI
• IRA	Infarct-Related Artery
• IABP	Intra-Aortic Ballon Pump
• IHD	Ischaemic heart disease
• INFUSE-AMI	Intra-coronary abciximab and aspiration thrombectomy in patients with large anterior MI
• IMR	Index of microcirculatory resistance
• ISR	Instant restenosis
• ICD	Implantable Cardioverter Defibrillator
• LAD	Left anterior descending artery
• LCX	Left circumflex artery
• LDL	Low Density Lipoprotein
• LGE –CMR	Late Gadolinium Enhancement cardiac magnetic resonance
• LIMA	Left internal mammary artery
• LM	Left main coronary artery
• MACE	Major Adverse Cardiac Events

• MBG	Myocardial Blush Grade
• MVD	Multi-vessel disease
• MI	Myocardial infarction
• MVO	Micro Vascular Obstruction
• NSTEMI	Non ST segment elevation myocardial infarction
• OMB1	First obtuse marginal branch
• OMB2	Second obtuse marginal branch
• PAD	Peripheral arterial disease
• PCI	Percutaneous coronary intervention
• PPCI	Primary percutaneous coronary intervention
• PET	Positron Emission Tomography
• PDA	Posterior descending artery
• PTCA	Percutaneous trans luminal coronary angioplasty
• RAD	Radial approach
• RCA	Right coronary artery
• REMEDIA	Randomized evaluation of effect of mechanical reduction of distal embolization by thrombus aspiration and rescue angioplasty
• RI	Ramus intermediate branch
• RT	Rheolytic thrombectomy
• SPECT	Single Photon Emission Tomography
• STEMI	ST segment elevation myocardial infarction
• SVG	Saphenous venous graft
• SCAD	Spontaneous Coronary Artery Disease
• ST	Stent thrombosis
• STR	ST-segment resolution
• TA	Thrombus aspiration
• TIMI	Thrombolysis In Myocardial Infarction
• TAPAS	Thrombus aspiration during PCI in AMI study
• TASTE	Thrombus aspiration during PCI in AMI study
• TB	Thrombus Burden
• TRL	Target lesion revascularization
• TOTAL	Randomized trial of Primary PCI with or without routine manual thrombectomy study
• TVAC	Trans-vascular aspiratin catheter
• TVR	Target vessel revascularization
• UA	Unstable Anginae
• UFH	Unfractionated Heparin
• VAMPIRE	Vacuum aspiration thrombus removal

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I ntroduction

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A im of the work

Introduction

The care of STEMI patients has transformed in conjunction with major shifts in re-perfusion therapy strategies , from primarily pharmacological to catheter- based strategies. With simultaneous advances in medical therapy, the case fatality rate for STEMI patients has continued to decline(336).

The final outcome of STEMI patients is influenced by many variables such as co-morbidities, time delay to treatment, bleeding complications and resulting left ventricular ejection fraction. Another decisive factor is the TIMI flow and, even more importantly, myocardial re-perfusion after PCI (myocardial blush). The initial thrombus load at the culprit lesion site may increase the risk of distal embolization of thrombotic material, either spontaneously or peri-procedurally, which could reduce distal flow or lead to no-reflow, thus impairing reperfusion of viable myocardium(337).

While routine use of distal protection devices does not promote beneficial out-come and is thus not recommended, thrombus aspiration (TA) has recently shown mixed results. The objective of several prospective trials within the last few years was to clarify whether routine TA in STEMI patients, contributes to a reduced mortality. After the first promising results , mainly based on the single center (TAPAS trial) , routine TA has been integrated into ESC & American STEMI guidelines likewise as a class IIa recommendation , although not all studies have shown positive effects(338-340) .

TAPAS, however, was not powered to clinical endpoints. Recent results of the largest randomized trials to date (TASTE) study and (TOTAL) study , have not shown any significant differences in all-cause mortality , re-hospitalizations or stent thrombosis after a maximum of one-year follow-up period . These results suggest that routine use of TA is not

necessary as a standard procedure in STEMI patients , and actually contraindicated , but may be considered in selected patients according to operator opinion , as recommended in 2014 ESC guidelines(341-344) .

But thrombus aspiration (TA) might have a potential role in STEMI patients with heavy thrombus burden, remains to be considered & a more thorough removal of thrombus is beneficial to patients with large thrombus burden, which can be achieved by more effective aspiration thrombectomy devices with effective antithrombotic therapy .Because those patients with the most residual thrombus before stenting have poorer micro-vascular function and greater myocardial damage(345).

Aim of the work

- It is a comparative study to study the in-hospital & short term outcome of using manual thrombus aspiration in STEMI patients undergoing primary PCI & showing large thrombus burden

Review Of literature

Chapter 1

Acute Coronary Syndrome

Coronary artery disease falls in the center of the spectrum of myocardial ischemia, which ranges from stable angina pectoris to acute myocardial infarction (MI) associated with ST-segment elevation on the electrocardiogram (ECG) i.e. STEMI ⁽¹⁾. The latter is usually caused by acute, total obstruction of a coronary artery ^(2,3), and urgent reperfusion is the mainstay of therapy. In contrast, unstable angina/non-ST-segment-elevation myocardial infarction (UA/NSTEMI) is usually associated with a severe (but non occlusive) lesion in the culprit coronary artery(3).

The clinical spectrum of non-ST-elevation ACS (NSTEMI-ACS) may range from patients free of symptoms at presentation to individuals with ongoing ischaemia, electrical or haemodynamic instability or cardiac arrest. The pathological correlate at the myocardial level is cardiomyocyte necrosis [NSTEMI-myocardial infarction (NSTEMI)] or, less frequently, myocardial ischaemia without cell loss (unstable angina). A small proportion of patients may present with ongoing myocardial ischaemia, characterized by one or more of the following: recurrent or ongoing chest pain, marked ST depression on 12-lead ECG, heart failure and haemodynamic or electrical instability. Due to the amount of myocardium in jeopardy and the risk of malignant ventricular arrhythmias, immediate coronary angiography and, if appropriate, revascularization are indicated (4).

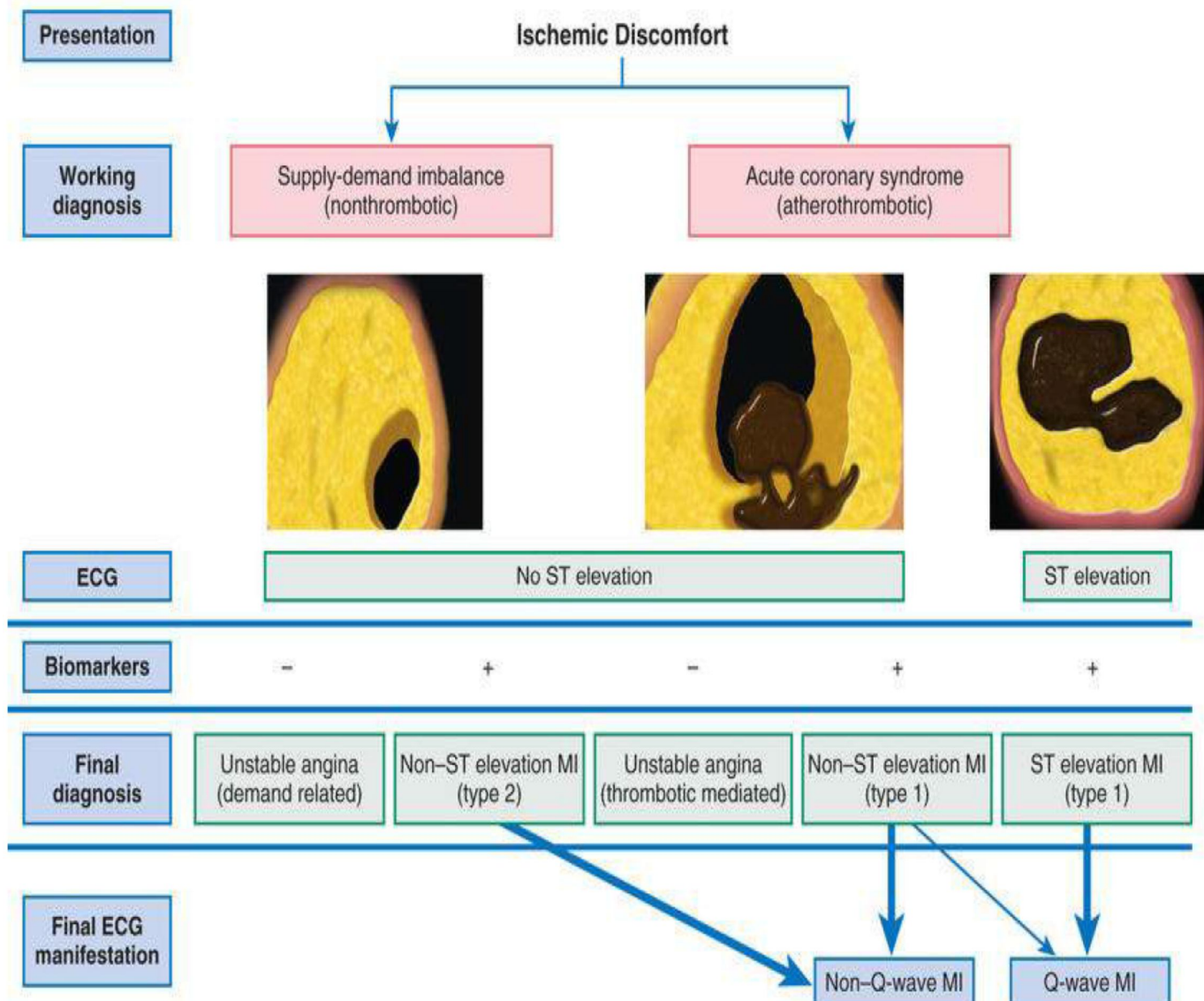
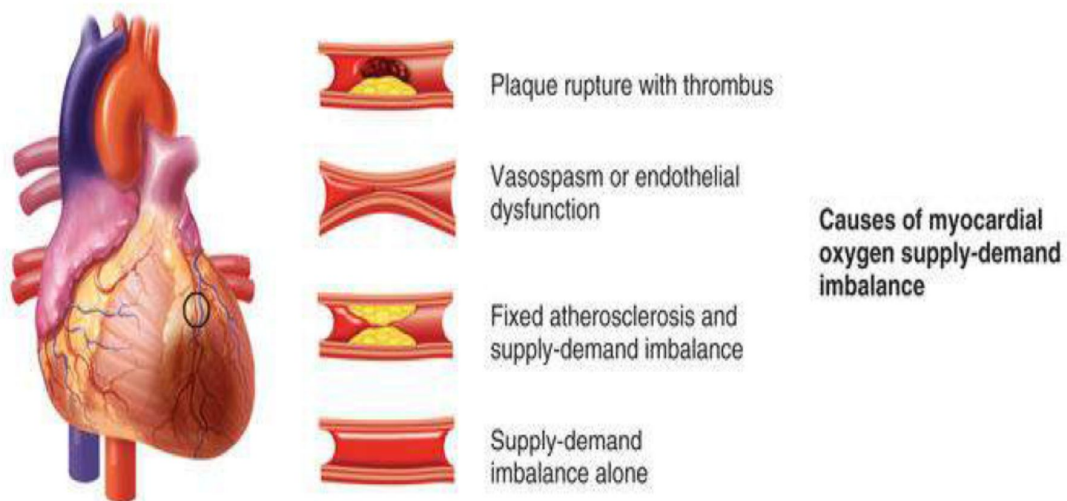


Figure (1) Myocardial Ischaemia and Infarction can result from various disease processes (5).