Use of ClearWay™ Intra Coronary Eptifatide and Isoptin Versus Use of Mechanical Aspiration Thrombectomy Device (Diver CE) in Primary PCI in Patients with STEMI

Thesis

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In Cardiology

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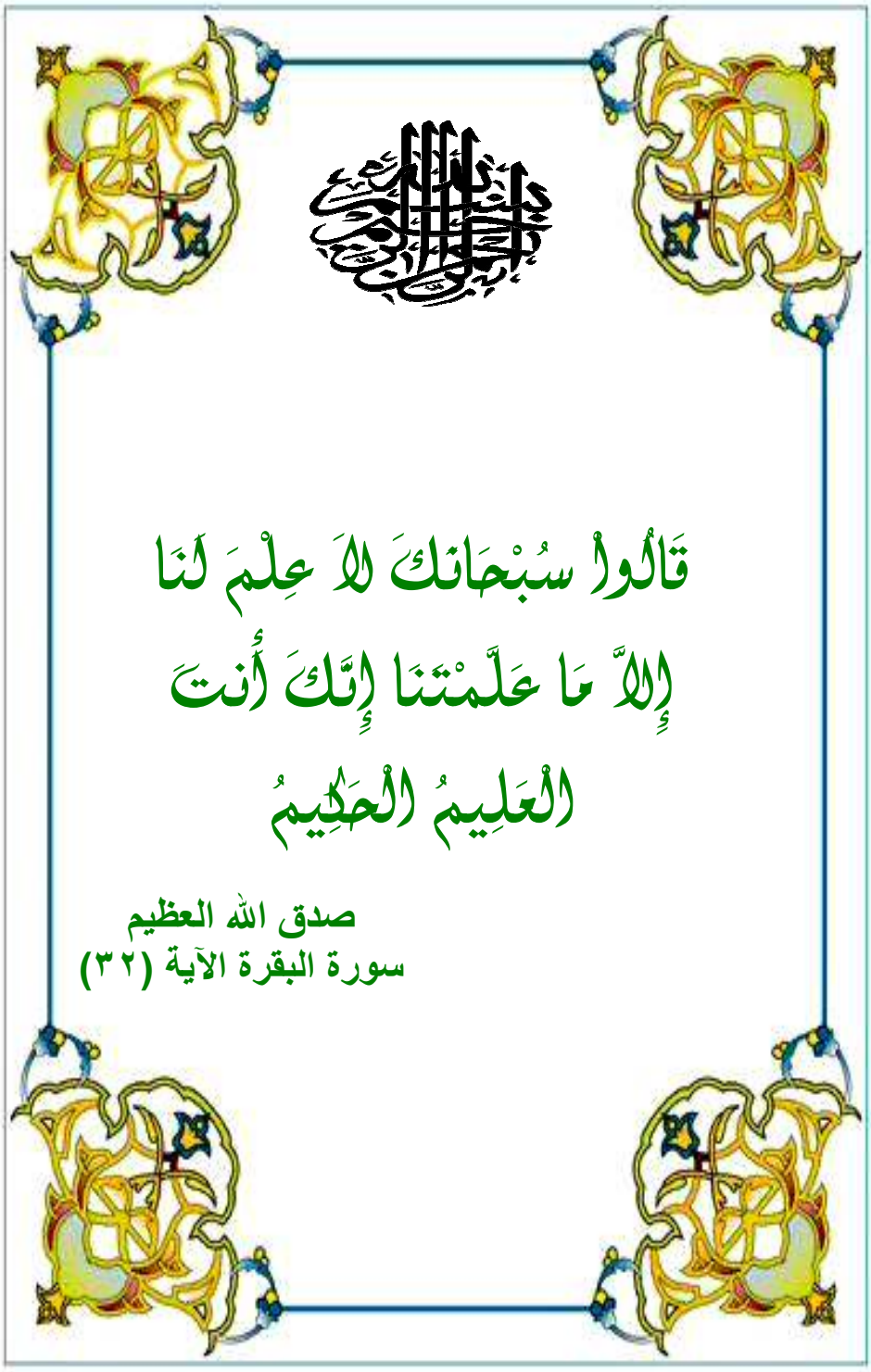

قَالُواْ سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ
الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم
سورة البقرة الآية (٣٢)

استخدام ClearWay وحقن ايبتيفاتيد و ايزوبتين داخل الشرايين التاجية، مقابل استخدام جهاز ميكانيكي Diver CE لاستئصال الخثرة في المرضى الذين يعانون من ارتفاع القطعة ST الذى تم معالجتهم بالقسطرة التداخلية الاولية

رسالة

توطئة للحصول على درجة ماجستير
في أمراض القلب والأوعية الدموية

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List of Abbreviations

ACS	: Acute coronary syndrome
AIVR	: Accelerated Idioventricular Rhythm
BNP	: Beta natriuretic peptide
CE	: Clot Extraction
CFR	: Coronary flow reserve
CHD	: Coronary heart disease
CHF	: Congestive heart failure
CI	: Confidence interval
CMR	: Cardiovascular magnetic resonance
cTFC	: Corrected TIMI frame count
ECG	: Electrocardiographic
FDA	: Food and Drug Administration
IRA	: Infarct-related artery
LAD	: The left anterior descending
LCX	: Left circumflex artery
LIBS	: Ligand-induced binding sites
LVEDV	: LV end-diastolic volume
LVEF	: LV ejection fraction
MACE	: Major adverse cardiac events
MBG	: Myocardial blush grade
MCE	: Myocardial contrast echocardiography
mm	: Millimeters
MPI	: Myocardial Perfusion Imaging

List of Abbreviations (Cont.)

NS	: Non-significant
NSTEMI	: Non-STEMI
Nt-proBNP	: N-terminal fragment of the prohormone
PCI	: Percutaneous coronary intervention
RBC	: Red Blood Cell Count
RCA	: Right coronary artery
RGD	: Arg-Gly-Asp-
SPECT	: Sestamibi single photon emission computed tomography
STEMI	: ST-segment elevation myocardial infarction
TIMI	: Thrombolysis in Myocardial Infarction
vWF	: von Willebrand factor
WBC	: White Blood Cell Count

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INTRODUCTION

Atherosclerosis is said to be the 21st century pandemic. It is almost universally present in adults in both developed and developing countries accounting for major economic losses and consuming healthcare funds[(1)].

Its presentation is diverse as it can manifest clinically as coronary heart disease (CHD), cerebrovascular disease (stroke), or peripheral arterial disease[(1)].

In affluent societies, coronary artery disease causes severe disability and more death than any other disease, including cancer. It manifests as angina, silent ischemia, unstable angina, myocardial infarction, arrhythmias, heart failure, and sudden death[(2)].

ST- elevation myocardial infarction is by far the most serious presentation of Atherosclerotic coronary artery disease carrying the most hazardous consequences& patients with ST elevation are triaged immediately for reperfusion therapy, according to ACC/AHA& ESC guidelines for acute MI[(3)].

In the ACC/AHA& ESC guidelines primary PCI is a class 1 indication for ST- elevation acute coronary syndrome or new left bundle branch block if performed within proper time window of symptom onset[(4)].

Primary percutaneous coronary intervention (PCI) is considered the preferred reperfusion modality for patients presenting with ST-segment elevation myocardial infarction (STEMI) regardless of the hour of presentation as long as reperfusion can occur in a timely manner[(5)].

It is possible that differences in technical details of the procedure account for major part of success of primary PCI. Yet despite the prompt and successful restoration of ante grade epicardial blood flow by PCI, a significant proportion of patients with AMI remain at increased risk of death and adverse outcomes. Efforts directed towards the identification of these patients prior to hospital discharge have utilized clinical markers such as demographic characteristics and bedside findings, and non-invasive and invasive testing[(6)].

However, microvascular obstruction with diminished myocardial perfusion occurs in a large proportion of patients with a patent epicardial vessel after primary PCI, and this event is associated with an increased infarct size, reduced recovery of ventricular function, and increased mortality[(7)].

The high frequency of suboptimal myocardial reperfusion after primary PCI has resulted in the development of various devices to protect the microcirculation. Different feasible and safe thrombectomy and distal protection devices have been used in clinical practice. The efficiency and safety of

adjunct thrombectomy using Diver CE device (Invatec, Italy) has been established[8].

A promising novel solution to ameliorate the outcome of angioplasty for acute coronary syndromes resides in the combined use of pharmacological and catheter-based therapies to increase local concentration of drugs such as glycoprotein IIb/IIIa inhibitors at the culprit site, prolonging their residency time[9].

The ClearWay™ RX Catheter is a low pressure atraumatic infusion balloon that allows for enhanced drug bioavailability and uptake while minimizing systemic effects. This super selective local drug delivery technique provides up to 500 times the systemic concentration of a drug by gently occluding the blood flow and significantly increasing the residence time of the infused drug at the specific target site.

In This study we will focus the light on the use of Diver CE cather and the use of ClearWAy intracoronary eptifatide in primary PCI for patients with STEMI, and evaluate their net effect on myocardial reperfusion as assessed by TIMI flow, myocardial blush grade, and corrected TIMI frame count post procedure. We also compare both these two techniques to the conventional PCI technique used.

AIM OF THE WORK

To compare the Use of ClearWay™ Intra Coronary eptifatide and isoptin versus use of aspiration thrombectomy device (Diver CE) in primary PCI in patients with STEMI, having a control group of patients managed by conventional PCI techniques.