Incidence of Pericardial Complications after Percutaneous Coronary Intervention by Echocardiography

Thesis

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Master Degree in ***Cardiovascular Medicine***

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Mariam Anwer Dawood Gobrial

Dedication

To:

My parents

for their endless love, support,

and continuous care

My Husband (Dr. Beshoy),

My Son (Daniel)

&

My Family

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List of Abbreviations

Abb.	Full term
ACC	American college of cardiology
AHA	American heart association
AMI	Acute myocardial infarction
BP	Blood pressure
CABAG	Coronary artery bypass graft
CBC	Complete blood count
CRP	C-reactive protein
CSS	Canadian cardiovascular surgery
DES	Drug eluting stent
DM	Diabetes mellitus
ESC	European society of cardiology
HG	Haemoglobin
HR	Heart rate
HTN	Hypertension
IVC	Inferior vena cava
IVIG	Intra venous immunoglobulin
LAD	Left anterior descending artery
LCX	Left circumflex
NSAIDS	Non steroidal anti inflammatory drugs
NSTEMI	Non ST-elevation myocardial infarction
NYHA	New York heart association
PCI	Percutaneous coronary intervention
PLT	Platelets
PTCA	Percutaneous transluminal coronary angioplasty
RA	Right atrium
RBS	Random blood sugar
RCA	Right coronary artery
RV	Right ventricle
SLE	Systemic lupus erythromateous
STEMI	ST_elevation myocardial infarction
SVC	Superior vena cava
TB	Tuberculosis
TLC	Total leucocytic count

INTRODUCTION

Pericarditis: inflammation of the pericardium, it could be acute occurs suddenly doesn't last long or chronic develops over time takes longer time to be treated. The incidence of pericarditis was reported to be considerably higher in the prethrombolytic era (20.0% and 23.4% in two studies ***(Dubois et al., 1985; Tofler et al., 1989).***

Pericardial effusion pathological accumulation of fluid in pericardial sac normally there is 10 to 15 ml fluid ***(Lind et al., 2011)***.

Clinical presentation of pericardial effusions relates to the speed of accumulation rather than the size, also relates to impairment of cardiac function ***(Spodick et al., 2003).***

Pericardial effusions are found in 15 to 28 % of patients presenting with a 1st myocardial infarction. They are more common in patients with anterior STEMI, larger infarcts and in the presence of congestive heart failure ***(Widimský et al., 1995; Nemeth et al., 2003).*** It usually appears during the initial 5 days, disappearing slowly over during several weeks to months ***(Galve et al., 1986).*** Two-thirds of those patients with moderate-to-severe effusions develop tamponade or left ventricular free wall rupture (LVFWR) ***(Figueras et al., 2002).***

Ming-Jui Hung and colleagues reported a case of acute pericarditis after PCI complicated by coronary dissection and

concluded that coronary dissection and subsequent pericardial hematoma formation could be the cause of the early pericarditis ***(Hung et al., 2003).***

Coronary perforation and pericardial effusion in coronary intervention is a rare complication of this procedure, Incidence has been reported to be between 0.2% and 0.6 %.

The frequency of iatrogenic coronary perforations has increased over the years, with the advent of new percutaneous revascularization techniques and greater incidence of PCI .They are usually associated with guide wire trauma or catheter or manipulation of atherosclerotic vessel segments during PCI, Guide wire coronary perforation in this setting may be a benign event under-reported unless a balloon is inflated in the tract; in which case, tamponade may ensue ***(Ellis et al., 1994)***.

This complication was seen in the treatment of chronic occlusions, which are therefore not risk free procedures which needs expertise in the use of covered stents to provide a valuable rescue option for this serious complication.

The presentation depends on at least 5 factors: the size of the device caused the perforation, the structure that is perforated; the hemodynamic state at the time of perforation; properties of the pericardium itself; and the coagulation status ***(Rogers et al., 2004).***

In a study conducted in 6245 patients over 5 years 52 coronary perforation occurred divided according to the drugs and equipment used where intervention was complicated by coronary perforation ***(Gruberg et al., 2000)***.

Device used	**Heparin dose (U)**
Balloon only 22 (42%)	5000 13 (25%)
Intracoronary stent 26 (50%)	10 000 36 (69%)
Thrombectomy device 0	>10 000 3 (6%)
Rotational atherectomy 4 (8%)	Glycoprotein IIb/IIIa antagonist 10 (19%)
Type of guidewire	
Floppy tip (non-hydrophilic) 22 (42%)	
Intermediate (non-hydrophilic) 14 (27%)	
Standard (non-hydrophilic) 2 (4%)	
Hydrophilic 14 (27%)	

(Gruberg et al., 2000)

Aim of the Work

Screening of occurrence of acute pericardial complication such as pericarditis and pericardial effusion after urgent or elective percutaneous coronary intervention by echocardiography within 24 hours after the procedure.

Chapter 1

PERICARDITIS

Acute pericarditis is a common disorder caused by inflammation of the pericardium and can occur as an isolated entity or as a manifestation of an underlying systemic disease. It is diagnosed in approximately 0.1% of hospitalized patients and in 5% of patients admitted to the emergency department with noncardiac chest pain.

Could be dry, fibrinous or effusive ***(Maisch et al., 1994).***

Chronic pericarditis:

(>3 months) pericarditis includes effusive (inflammatory or hydropericardium in heart failure), adhesive, and constrictive forms ***(Spodick, 2001)***.

Recurrent pericarditis:

The term recurrent pericarditis encompasses

(1) *The intermittent type* (symptom free intervals without therapy).

(2) *The incessant type* (discontinuation of anti-inflammatory therapy ensures a relapse).

It is generally presumed to be immune mediated.

Massive pericardial effusion, overt tamponade or constriction are rare ***(DeLine and Cable, 2002)***.

Table (1): Definitions and diagnostic criteria for pericarditis ***(ESC Guidelines, 2015)***.

Pericarditis	Definition and diagnostic criteria
Acute	Inflammatory pericardial syndrome to be diagnosed with at least 2 of the **4 following criteria:** (1) pericarditic chest pain (2) pericardial rubs (3) new widespread ST-elevation or PR depression on ECG (4) pericardial effusion (new or worsening) **Additional supporting findings:** - Elevation of markers of inflammation (i.e. C-reactive protein, erythrocyte sedimentation rate, and white blood cell count); - Evidence of pericardial inflammation by an imaging technique (CT, CMR).
Incessant	Pericarditis lasting for >4–6 weeks but <3 months[a] without remission.
Recurrent	Recurrence of pericarditis after a documented first episode of acute pericarditis and a symptom-free interval of 4–6 weeks or longer[a].
Chronic	Pericarditis lasting for >3 months.

(Imazio et al., 2005)

Etiology:

The pericardium may be affected by all categories of diseases, including infectious, autoimmune, neoplastic, iatrogenic, traumatic, and metabolic.

Diagnosis:

Symptoms: A prodrome of fever (usually <39 celsius), malaise, and myalgia is common, but elderly patients may not be febrile. Major symptoms are retrosternal or left precordial chest pain (radiates to the trapezius ridge, can be pleuritic or simulate ischaemia, and varies with posture) non-productive cough, and shortness of breath ***(Spodick, 2001)***.