

Cardiac implantable electric device (CIED) - related complications (Ain Shams Registry)

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by

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List of abbreviations

%	Percentage
(r)	Pearson's correlation coefficient
ACC	American College of Cardiology
AF	Atrial fibrillation
AHA	American Heart Association
ARVD	Arrhythmogenic right ventricular dysplasia
ASD	Atrial septal defect
AV	Atrioventricular
BBB	Bundle branch block
BP	Blood pressure
BPEG	British Pacing and Electrophysiology Group
bpm	Beat per minute
CA	Coronary angiography
CDRI	Cardiac device related-infection

CDRIE	Cardiac device related infective endocarditis
CHB	Complete heart block
CHF	Chronic heart failure
CIED	Cardiac implantable electric device
Cong. CHB	Congenital complete heart block
CRT	Cardiac resynchronization therapy device
CRT-D	CRT with defibrillator function
CRT-P	CRT with pacemaker function
D	Day
DBT	Device-based therapy
DCM	Dilated cardiomyopathy
DDD	Dual chamber pacemaker (pacing & sensing RA & RV) with dual mode of response
DDD-R	Dual chamber pacemaker (pacing & sensing RA & RV) with dual mode of response, and with rate responsiveness
DDI	Dual chamber pacemaker (pacing & sensing RA & RV) with only inhibitory mode of response
DM	Diabetes mellitus

ECG	Electrocardiogram
EF	Ejection fraction
ELT	Endless loop tachycardia
EMI	Electromagnetic interference
ESC	European Society of Cardiology
FH	Family history
GDMT	Guideline-directed medical treatment
HB	Heart block
HCM	Hypertrophic cardiomyopathy
HF	Heart failure
HOCM	Hypertrophic obstructive cardiomyopathy
HR	Heart Rate
HRS	Heart Rhythm Society
HTN	Hypertension
ICD	Implantable cardioverter defibrillator device
ICM	Ischemic cardiomyopathy
LA	Left atrium

LV	Left ventricle
LVEF	Left ventricle ejection fraction
M	Month
MI	Myocardial infraction
ml	Milliliter
Msec	Milliseconds
MTR	Maximum tracking rate
MVR	Mitral valve replacement
NASPE	North American Society of Pacing and Electrophysiology
NYHA	New York Heart Association
P wave	Atrial depolarization wave
PFO	Patent foramen ovale
PMT	Pacemaker-mediated tachycardia
Postop. CHB	Postoperative complete heart block
PPCM	Peripartum cardiomyopathy
PPM	Permanent pacemaker

PVARP	Postventricular atrial refractory period
PVC	Premature ventricular contractions
QRS complex	Ventricular depolarization
RA	Right atrium
RV	Right ventricular
SA	Sinoatrial
SCA	Sudden cardiac arrest
SCD	Sudden cardiac death
SND	Sinus node dysfunction
SVCS	Superior vena cava syndrome
SD	Standard deviation
sec	Second
T wave	Ventricular repolarization wave
TEE	Transesophageal echocardiography
TTE	Transthoracic echocardiography
VA	Ventriculoatrial

VDD	Single chamber pacemaker pacing and sensing the RV, only sensing the RA
VOO	Single chamber pacemaker, pacing the RV without sensing
VSD	Ventricular septal defect
VT	Ventricular tachycardia
VVI	Single chamber pacemaker pacing & sensing RV, with inhibitory mode of response
VVI-R	Single chamber pacemaker pacing & sensing RV, with inhibitory mode of response, and rate responsiveness
y	Year

List of tables

Table 1: Revised NASPE/BPEG Generic Code for

Antibradycardia Pacing

Table 2: Indications of cardiac pacing

Table 3: Indications of cardiac resynchronization

Table 4: Indications of ICD

Table 5: Baseline patient characteristics_

Table 6: Types of CIED

Table 7: Indications of CIED implantation

Table 8: Incidence of CIEDs complications and re-intervention

Table 9: Lead-related complications

Table 10 : Pocket-related complications

Table 11: History of CDRI re-intervention

Table 12: History of battery exchange

Table 13: History of lead re-intervention

Table 14: Complications in relation to gender

Table 15: Lead-related complications in relation to
gender

Table 16: Complications in relation to age

Table 17: Complications in relation to BMI

Table 18: Complications in relation to Hyperternsion

Table 19: Complications in relation to Diabetes

Table 20: Complications in relation to Smoking

Table 21:Lead-related complications in relation to
smoking

Table 22: Complications in relation to single and dual
chamber pacemakers

Table 23: Complications in patients with dual chamber
device

Table 24: Complications in patients with single
chamber device

Table 25: Complications in patients with CRT

Table 26: Complications in patients with ICD

List of figures

Figure 1: Chest x-ray showing pneumothorax as a complication of implantation of CIED

Figure 2: CT scan of the chest showing perforation of the right ventricular anterior wall by the RV lead of CIED

Figure 3: Chest x-ray showing twisting of the battery of the CIED causing upward migration of the tip of RV lead into the left innominate vein

Figure 4: A patient with implanted CIED showing pocket swelling caused by pocket hematoma leading to dehiscence of the edges of the wound

Figure 5: A patient with erosion of the skin overlying the battery of the CIED causing exposure of part of the battery

Figure 6:Microbiology of CIED infections

Figure 7: ECG showing complete heart block

Figure 8: ECG showing bifascicular block

Figure 9: ECG showing atrial fibrillation with slow
ventricular response

Figure 10: ECG showing ventricular tachycardia

Figure 11: ECG showing well-functioning dual
chamber pacemaker with atrial pacing and
ventricular pacing

Figure 12: Process of CIED programming

Figure 13: Gender distribution of the patients

Figure 14: Age distribution of the patients

Introduction

Several classifications for cardiac implantable electric device (CIED) complications exist, they can be classified according to implantation time into acute (immediate) or chronic, according to the site of complication into lead or pocket complications, and according to etiology into implantation or system failures. Implantation-related complications are the most common. *[Gul & Kayrak, 2011]*

CIED implantation is a safe procedure, but these complications can happen even with experienced operators. *[Gul & Kayrak, 2011]*

There is only limited information available about the complications related to modern CIED. Most of the existing data are based on the 1970s and are no longer valid for current practice. The recent reports on CIED complications are focused on some specific complications or are restricted to early complications. *[Kiviniemi et al., 1999]*

In a retrospective study reviewing 446 patients who had received permanent endocardial pacemakers in which, attention was paid to the occurrence of any complication during

implantation or follow-up; early complications were detected in 6.7% of patients, while late complications occurred in 7.2% of the patients. Complications related to the implantation procedure occurred in 3.1%. Inadequate capture or sensing was observed in 7.4% of the patient. [*Kiviniemi et al., 1999*]

Complications of CIED include those related to pacing system malfunction (such as oversensing, undersensing, loss of capture, loss of output, inappropriate mode, inappropriate rate, pacemaker-mediated tachycardia, pacemaker syndrome & true generator failure), early lead related complications (such as perforation, malposition, dislodgement and diaphragmatic stimulation, whereas pocket-related complications include hematoma, skin erosion, wound pain & infection) and delayed lead complications (such as venous thrombosis, exit block, insulation failure and conduction failure. Late lead damage can be reduced by cephalic and axillary venous access). [*Trochman et al., 2004*]

Aim of work

The aim of this study is to register and analyze cardiac implantable electric device (CIED) related complications in patients presenting to the CIED programming clinic at Ain Shams University Hospitals.