Intermediate and Long-Term Outcome of Percutaneous Trans-catheter Device Closure of Ventricular Septal Defects

Thesis

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List of Abbreviations

Abb.	Full term
1st DHB	First degree heart block
ADO	Amplatzer duct occlude
ASO	Amplatzer Septal Occluder
AV prolapse	Aortic valve prolapse
AV	Aortic valve
AVP	Amplatzer vascular plug
BMI	Body mass index
BSA	Body surface area
CHB	Complete heart block
CHD	Congenital heart disease
CHD	Congenital heart disease
Cm	Centimeter
Complete AVB	Complete atrioventricular heart block
Dist-Av-VSD	Distance between aortic valve and VSD
ECG	Electrocardiogram
EF	Ejection fraction
ESC	European society of cardiology
Fup	Follow up
Kg	Kilogram
LA	Left atrium dimension
LV	Left ventricle
LVEDD	Left ventricular end diastolic dimension
LVEDV	Left ventricular end diastolic volume
LVESD	Left ventricular end systolic dimension
LVESV	Left ventricular end systolic volume
LVOT	Left ventricular outflow tract
LVESDD/BSA	left ventricular end diastolic diameter per body surface area

List of Abbreviations Cont...

Abb.	Full term
LVESD/BSA	left ventricular end systolic diameter per body surface area
mPAP	Mean pulmonary artery pressure
MSCT	Multi-slice computed tomography
MV	Mitral valve
PFM coil	Nit-Occlud® Lê-VSD-Coil (Produkte für die Medizin AG, Cologne, Germany)
PV	Pulmonary valve
Qp:Qs	: Ratio of pulmonary blood flow to systemic blood flow
RAO	Right anterior oblique
RV	Right ventricle
RVSP	Right ventricular systolic pressure
SC	Spontaneous closure
TEE	Transesophageal echocardiography
TTE	Transthoracic echocardiography
TV	Tricuspid valve
VSD size LV	Size of ventricular septal defect from the left ventricular side
VSD size RV	Size of ventricular septal defect from the right ventricular side
VSD	Ventricular septal defect
Yr	Year

INTRODUCTION

Ventricular septal defect (VSD) is the most common congenital heart defect in children and adults. As an isolated finding, VSD accounts for approximately 20% to 30% of all types of congenital cardiac malformations. [1].

It has an overall prevalence of 3.94 per 1000 patients with a recent notable marked increase in incidence rates recently observed that is attributed to the advancement in imaging and screening programs. [2].

Clinical presentation of ventricular septal defects is variable according to its pathophysiology, which depends on several factors as size, location, direction, pressure gradient across defect and other associated defects in cardiac skeleton [3].

Untreated ventricular septal defect (VSD) with clinically significant left-to-right shunting is one of the most common causes of congestive heart failure and growth retardation in early infancy. These babies typically fail to thrive and are frequently hospitalized for lower respiratory tract infections [4].

Children with volume-overloaded left atrium and ventricle due to a symptomatic hemodynamically significant VSD, require intervention thus preventing long-term complications, including pulmonary hypertension, ventricular dilatation, arrhythmias, aortic insufficiency, double-chambered right ventricle, and endocarditis. [5]

Until recently, open-heart surgical closure has traditionally been considered the mainstay of intervention for the majority of VSDs which is a major procedure that necessitates thoracotomy, cardiopulmonary bypass (CPB), blood transfusion during or after surgery, permanent scarring and potential risk of complete heart block, residual shunting (10%), need for reoperation (2–5%), early and late arrhythmias, post-pericardiotomy syndrome and even mortality (0–3%) which is more significant in multiple, muscular, and apical VSD [6].

The development of a trans-catheter occlusion technique with the advancement of the newer percutaneous occluding VSD closure devices that can safely and effectively close these defects was welcomed by cardiologists, patients, and their families making trans-catheter device closure of ventricular septal defects (VSDs) an attractive and feasible alternative to surgical closure. [7].

Percutaneous ventricular septal defect closure is relatively a new effective treatment modality for ventricular septal defect patients. It seems appealing to study more the effect of percutaneous closure on left ventricle and to evaluate procedural complications [8].

Aim of the Study

To evaluate the intermediate and long-term follow-up outcome of patients who underwent percutaneous trans-catheter closure of isolated ventricular septal defects