بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Echocardiographic Evaluation of Changes in Cardiac Hemodynamics, Loading Conditions and Atrial Function After Transcatheter Closure of Atrial Septal Defect

A thesis

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LIST OF CONTENTS

INTRODUCTION **1**

AIM OF THE WORK **3**

REVIEW OF LITERATURE **4**

chapter I: The Anatomical Echocardiographic Examination of a Normal Heart: Atrial Septal Defect **4**

A- Incidence and causes: 4

B- Anatomy: 5

C- Pathophysiology of ASD: 7

C- Diagnosis of ASD: 9

Chapter II: Management of Ostium Secundum Atrial Septal Defect **15**

A- Indications for ASD closure: 15

B- Percutaneous closure of ASDs: 16

C- Complications associated with device closure: 19

D- Benefits and risks of transcatheter versus surgical intervention: 20

Chapter III: Echocardiographic Assessment of Cardiac Functions **21**

A- The anatomical echocardiographic examination of a normal heart: 21

B- Echocardiographic techniques: 22

C- Assessment of cardiac function: 29

PATIENTS AND METHODS **55**

RESULTS **77**

DISCUSSION **119**

SUMMARY **130**

CONCLUSION **132**

RECOMMENDATIONS **133**

REFERENCES **134**

ARABIC SUMMARY

LIST OF TABLES

Tables		Pages
Table (1):	Elements of a comprehensive echocardiographic evaluation for ASD	10
Table (2):	Two-dimensional echocardiographic of LA volume and function in healthy volunteers	48
Table (3):	Patient demographics	77
Table (4):	Comparison between the changes in RV dimensions before, 1 week, and 3 months after ASD transcatheter closure	80
Table (5):	Comparison of RA dimensions and volume before, 1week, and 3 months after transcatheter ASD closure parameters	83
Table (6):	Comparison between RA velocities, peak systolic strain and strain rate before, 1week, and 3 months after transcatheter ASD closure	87
Table (7):	Comparison between the change in LA dimensions and volume before, 1 week, and 3 months after ASD closure	91
Table (8):	Comparison between longitudinal velocity and strain and strain rate of LA before, 1 week, and 3 months after transcatheter ASD closure	95
Table (9):	Correlation between ASD size and RV dimensions	98
Table (10):	Correlation between ASD size and RA dimensions	100
Table (11):	Correlation between ASD size and RA peak systolic strain and strain rate	102
Table (12):	Correlation between different parameters	104
Table (13):	Correlation between different parameters	109
Table (14):	Correlation between different parameters	109
Table (15):	Correlation between QP/QS and peak systolic strain and strain rate.	115
Table (16):	Distribution of the studied cases according to demographic data.	117

LIST OF FIGURES

Figures **Pages**

Figure (1): Types of atrial septal defects---------- 7

Figure (2): Left to right flow across a secundum atrial septal defect in the subcostal view, by 2D transthoracic echocardiography with color Doppler ----------12

Figure (3): Demonstration of right ventricular enlargement in a patient with a secundum atrial septal defect in the apical four-chamber view by 2D transthoracic echocardiography ----------13

Figure (4): Left ventricular ejection fraction calculated from M mode at the parasternal long axis view.----------23

Figure (5): Spectral Doppler tracing from tricuspid regurgitation (TR) ----------26

Figure (6): VTI -LVOT measurement (apical three-chamber view).----------32

Figure (7): CW Doppler of MR. Measure time interval for velocity to increase from 1 m/s to 3 m/s , dP/dt = 32/t----------35

Figure (8): Left ventricular myocardial performance index (MPI) calculation from mitral annulus tissue Doppler recording. ----------37

Figure (9): Tricuspid annular plane systolic excursion (TAPSE) measured at the lateral tricuspid annulus in M-Mode----------44

Figure (10): Methods of determining indices of right ventricular systolic function ----46

Figure (11): Grades of diastolic dysfunction (Grade I show a reduced E/A ratio mitral inflow, measured by PW-Doppler, and a reduced E′/A′ ratio, measured by PW-TDI. Grade II represents "pseudonormalization", and grade III represents restrictive pattern).----------49

Figure (12): Diastolic function in PW-Doppler (a) or TDI (b) on the lateral side of the mitral annulus ----------50

Figure (13): *The strain curve as an indicator of LA function* (Atr. Contr: atrial contraction/contractile function of left atrium, MVC: mitral valve closure, AVO: aortic valve opening, AVC: aortic valve closure, MVO: mitral valve opening, and Diast.: diastole)----------52

Figure (14): Two-dimensional TTE of ostium secundum ASD from subcostal view (left panel) with measurement of the diameter in the anterior–posterior orientation, left to right flow by color Doppler (right panel). (patient number 3)----------58

Figure (15): Four chamber TTE view showing mildly dilated right ventricle, a secundum ASD measuring 10.0mm with adequate posterior rim for percutaneous closure (patient number 5)----------59

Figure (16): Shunt quantification, measuring RVOT diameter and RVOT VTI for quantifying the pulmonary flow (Qp) (left panel), and measuring LVOT diameter and LVOT VTI for quantifying the systemic flow (Qs) (right panel) (Patient number 4)----------60

Figure (17): Right ventricular dimensions (longitudinal, mid cavity and basal) in a patient with mildly dilated RV ----------62

Figure (18): Tissue Doppler for measurement of RV Tei index (Patient number 4).---63

Figure (19): Tricuspid annular plane systolic excursion (TAPSE) measured at the lateral tricuspid annulus in M-Mode (Patient number 2). ----------64

Figure (20): Left ventricular ejection fraction calculated from M mode at the parasternal long axis view (patient number 1).----------65

Figure (21): Right atrial dimensions measured in modified RV view. ----------66

Figure (22): Measurement of left and right atrial volumes (patient number 4)----------67

Figure (23): Assessment of regional left atrial myocardial function by tissue Doppler imaging. The sample volume was placed at the mid-level of left atrial anterior free wall on color tissue Doppler image to reconstitute the strain curves----------70

Figure (24): Assessment of regional right atrial myocardial function by tissue Doppler imaging. The sample volume was placed at the mid-level of right atrial free wall on color tissue Doppler image to reconstitute the strain curves. ----------72

Figure (25): Mid esophageal bicaval view at 97 degree, an adequate SVC rim 13 mm (left panel), mid esophageal bicaval view at 97 degree with an adequate IVC rim10 mm (right panel) (patient number 7). ----------73

Figure (26): Fluoroscopy shows the final position of the septal occluder device. (patient number 5)----------74

Figure (27): Gender distribution----------78

Figure (28): Age distribution----------78

Figure (29): Comparison between the changes in RV dimensions before, 1 week, and 3 months after ASD transcatheter closure ----------81

Figure (30): Comparison of RA dimensions and volume before, 1week, and 3 months after transcatheter ASD closure parameters ----------84

Figure (31): RA longitudinal peak systolic velocity (cm/sec), early diastolic velocity (cm/sec) and late diastolic velocity (cm/sec) (n=30) before, 1 week, and 3 months after ASD closure ----------88

Figure (32): RA peak systolic strain (%) (n=30) before, 1 week, and 3 months after ASD closure----------88

Figure (33): RA strain rate before, 1 week, and 3 months after ASD closure (1/sec) --89

Figure (34): LA dimensions and volumes before, 1 week, and 3 months after transcatheter ASD closure----------92

Figure (35): LA longitudinal systolic velocity (cm/sec), early diastolic velocity (cm/sec) and late diastolic velocity (cm/sec) (n=30) before, 1 week, and 3 months after closure ----------96

Figure (36): LA peak systolic strain (%) (n=30) before, 1 week, and 3 months after closure----------96

Figure (37): LA strain rate before, 1 week, and 3 months after transcatheter ASD closure (1/sec) ----------97

Figure (38): Correlation between ASD size (mm) and RV length (mm) before closure ----------98

Figure (39): Correlation between ASD size (mm) and RV mid dimension (mm) before closure ----------99

Figure (40): Correlation between ASD size (mm) and RV basal dimension (mm) before closure ----------99

Figure (41): Correlation between ASD size (mm) and RA end systolic length (mm) before ASD closure ---------- 100

Figure (42): Correlation between ASD size (mm) and RA end systolic width (mm) before ASD closure ---------- 101

Figure (43): Correlation between ASD size (mm) and RA end systolic volume (ml) before ASD closure. ---------- 101

Figure (44): Correlation between ASD size (mm) and RA peak systolic strain (%) before ASD closure. ---------- 102

Figure (45): Correlation between ASD size (mm) and RA strain rate (1/sec) before ASD closure. ---------- 103

Figure (46): Correlation between RA peak systolic strain (%) with RA end systolic length (mm). ---------- 105

Figure (47): Correlation between RA peak systolic strain (%) with RA end systolic width (mm). ---------- 105

Figure (48): Correlation between RA peak systolic strain (%) with RA end systolic volume (ml). ---------- 106

Figure (49): Correlation between RA strain rate (1/sec) with RA end systolic length (mm). ---------- 106

Figure (50): Correlation between RA Strain rate (1/sec) with RA end systolic width (mm). ---------- 107

Figure (51): Correlation between RA Strain rate (1/sec) with RA end systolic volume (ml). ---------- 107

Figure (52): Correlation between RA peak systolic strain (%) with TEI index (%). - 110

Figure (53): Correlation between RA peak systolic strain (%) with TAPSE (mm). - 110

Figure (54): Correlation between RA peak systolic strain (%) with RV length (mm). ---------- 111

Figure (55): Correlation between RA peak systolic strain (%) with RV mid dimension (mm). ---------- 111

Figure (56): Correlation between RA peak systolic strain (%) with RV basal dimension (mm). ---------- 112

Figure (57): Correlation between RA strain rate (1/sec) with TEI index (%). -------- 112

Figure (58): Correlation between RA strain rate (1/sec) with TAPSE (mm). --------- 113

Figure (59): Correlation between RA strain rate (1/sec) with RV length (mm). ------ 113

Figure (60): Correlation between RA strain rate (1/sec) with RV mid dimension (mm). ---------- 114

Figure (61): Correlation between RA Strain rate (1/sec) with RV basal dimension (mm). ---------- 114

Figure (62): Correlation between QP/QS with peak systolic strain (%) before closure. ---------- 116

Figure (63): Correlation between QP/QS with strain rate (1/sec) before closure. ---- 116

Figure (64): Distribution of the studied cases according to types of device . ---------- 118

Figure (65): Distribution of the studied cases according to size. ---------- 118

LIST OF ABBREVIATIONS

2 D	: Two-dimensional echocardiography
3D	: Three-dimensional echocardiography
ASD	: Atrial septal defect
CI	: Cardiac index.
CO	: Cardiac output
CWD	: Continuous wave Doppler
DTI	: Doppler tissue imaging
EF	: Ejection fraction
ET	: Ejection time
FS	: Fractional shortening
ICE	: Intracardiac echocardiography
ICT	: Isovolumic contraction time
IRT	: Isovolumic relaxation time
IVC	: Inferior vena cava
LA	: Left atrium
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
MPI	: Myocardial performance index
PAP	: Pulmonary artery pressure
PWD	: Pulsed wave Doppler
RA	: Right atrium
RV	: Right ventricle

RVOT : Right ventricle outflow tract

SV : Stroke volume

SVC : Superior vena cava

TEE : Trasesophageal echocardiography

TR : Tricuspid regurgitation

TTE : Transthoracic echocardiography

TVI : Time velocity integral

INTRODUCTION

Atrial septal defect (ASD), which constitutes 5–10% of all congenital heart defects, is the most frequently encountered congenital heart defect in adult patients with the exception of bicuspid aortic valve and mitral valve prolapse [(1)]. Persistent shunt, resulting in right atrial dilation, may lead to symptomatic cardiac arrhythmias. The long-standing left to right shunt causes right ventricular (RV) volume overload and changes in pulmonary vasculature resulting in later RV pressure overload. The risk of development of pulmonary vascular diseases is higher in female patients and in older adults with untreated defects [(2)].

In a patient with ASD and right heart enlargement, closure of defect is recommended for the prevention of RV failure, paradoxical emboli and atrial arrhythmias [(3)]. The mainstay of therapy is closure of the defect by surgical or transcatheter techniques. Primary surgical closure has been the standard approach for many years with high success rate. Surgical closure of ASD is preserved to those patients with ASD who are not technically suitable for transcatheter closure. Transcatheter closure of ASD in selected patients has the advantages of short hospital stay and relatively easy procedure [(4)].

It provides similar efficacy and hemodynamic benefits, but reduced complication rates compared with surgery, especially in older patients. In many previous studies, the results of transcatheter closure of ASD with septal occluder have been evaluated and the efficacy and safety of the procedure have been well documented in both childhood and adulthood. Notably, most of reports are concerned with residual shunting in a wide range of anatomical scenarios, occluder displacement, or thrombotic events [(5)].

The changes in loading conditions, atrial function, and the different echocardiographic parameters before and after transcatheter ASD closure are still under study. So we felt the need to evaluate the echocardiographic changes that occur and detect the timing after closure at which the right ventricular hemodynamics and measurements are back to normal.