Percutaneous Balloon Pulmonary Valvuloplasty for Pulmonary Valve Stenosis in Neonates, Infants and Children: 10 Years' experience at Cairo University Pediatric Hospital

Thesis subjected to partial fulfillment of Master Degree of Pediatrics

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ABSTRACT

Background: Balloon pulmonary valvuloplasty (BPV) is the treatment of choice for patients with pulmonary valve stenosis (PS). **Methods:** An observational retrospective cross sectional study was done on cases underwent BPV from 2004-2013 in cardiac cath unit- pediatric cardiology department- Cairo university. The registry was queried for cases of isolated BPV. Multivariable models were built to report the predictors of outcome of balloon pulmonary valvuloplasty and its complications both during and early after the intervention. **Results:** 1200 cases were included in the study and subdivided into age groups (Neonates: 282 cases, Infants: 362 cases and Children: 556 cases). Procedural success was achieved in 82.7% procedures, being defined as drop of right ventricular systolic pressure to less than or equal to 50% of the baseline measurements. Procedural success was more common in children age group (84.5%) compared to other age groups. Among the unsuccessful group which represents 17.3% of the study group, 13.7 % underwent redo of BPV while 3.6% undergone surgery. Complications observed in 8.5% of cases being the commonest in the neonatal age group with 21.6%. **Conclusions:** BPV is the treatment of choice for pulmonary valve stenosis in all age groups and the immediate post-BPV pressure gradient drop was the most important predictor of success of BPV.

Key words:

(Valvular Pulmonary stenosis, Balloon valvuloplasty, Redo, Surgical valvotomy).

DEDICATION

I would like to dedicate this Master dissertation to **my wife and my family** Record. There is no doubt in my mind that without their continued support and counsel I could not have completed this process.

I would like to acknowledge the inspirational instruction and guidance of **Prof .Dr. Sonia Ali El-Saiedi** and **Prof .Dr. Amr Malash** with the great efforts and assistance of **Dr. Doaa Abd El-Aziz**. They have given me a deep appreciation, feedback and advice.

CONTENTS

LIST OF ABBREVIATIONS

ACT: Activated Clotting Time.

ASD: Atrial Septal Defect.

Bal: Balloon.

BPV: Balloon Pulmonary Valvuloplasty.

Cath: Catheterization.

CC: Cubic Centimeter.

CT: Computed Tomography.

Echo: Echocardiography.

IM: Intra-muscular.

IV: Intra-venous.

IU: International Unit.

kg: Kilogram.

LPA: Left Pulmonary Artery.

Max: Maximum.

mg: Milligram.

min: Minute.

mm: Millimeter.

mmHg: Millimeters of Mercury.

MR: Mitral Regurge.

MRI: Magnetic Resonance Imaging.

N: Number.

PA: Pulmonary Artery.

PAP: Pulmonary Artery Pressure.

PASP: Pulmonary Artery Systolic Pressure.

PDA: Patent Ductus Arteriosus.

PFO: Patent Foramen Ovale.

PG: Pressure Gradient.

PO: Per Oral.

PR: Pulmonary Regurge.

PS: Pulmonary Stenosis.

PV: Pulmonary Valve.

PVS: Pulmonary Valve Stenois.

RA: Right Atrium.

RPA: Right Pulmonary Artery.

RV: Right Ventricle.

RVP: Right Ventricular Pressure.

RVSP: Right Ventricular Systolic Pressure.

SD: Standard Deviation.

TR: Tricuspid Regurge.

TV: Tricuspid Valve.

VSD: Ventricular Septal Defect.

LIST OF TABLES	Page

or immediately after (BPV) in each age group.	

INTRODUCTION AND AIM OF WORK

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The traditional method of treatment for congenital pulmonic valve stenosis was surgical valvotomy until 1982, when **Kan et al, (1982)** introduced the technique of percutaneous balloon pulmonary valvuloplasty. The short-term **(Kan et al, 1984; Rocchini et al, 1984; Khan et al, 1986; Piechaud et al, 1987; Rey et al, 1988; Santro et al, 1988; Schmaltz et al, 1989; Stanger et al, 1990; and Maalouk et al, 1995)** and mid-term **(Al Kasab et al, 1988; Mullins et al, 1988; Rao et al, 1988; O'Connor, 1992 and Shrivastava et al, 1993).** Results of balloon pulmonary valvuloplasty have been so good that nowadays it has become the preferred method of therapy for moderate to severe pulmonary valve stenosis in children and adults. However, data documenting long term effectiveness of this procedure are scarce **(Mc Crindle et al, 1991; Masura et al, 1993 and Mc Crindle et al, 1994).**

The aim of this work is to determine the outcome of trans-catheter balloon dilatation of the pulmonary valve in children with pulmonary valve stenosis with a wide range in age and severity, also to report the predictors of outcome of balloon pulmonary valvuloplasty and its complications both during and early after the intervention.