

Predictors of outcome of successful balloon dilatation of Pulmonary stenosis in neonates and infants

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Introduction

Balloon pulmonary valvuloplasty (BPV) is the treatment of choice for patients with pulmonary valve stenosis (PS). Several Factors could influence the outcome of such procedure and can determine the possibility of redo on short term.

Aim of the Work

Multivariable models were built to report the predictors of outcome of balloon pulmonary valvuloplasty and its complications both during and early after the intervention.

Patients and Methods

An observational cross sectional study including neonates and small infants underwent BPV in the period from 2004-2013 in Cardiac Cath Unit- Pediatric Cardiology Department- Cairo University.

Successfulness of the procedure was defined as the drop of the RV pressure to <50 % of precath values.

Complications occurred during or immediately after the procedure were recorded.

Cases underwent reintervention either by cath or surgery were recorded during the first three months after the first trial.

Results

Starting January 2004 until December 2013.

644 patients were included in the study.

They were divided according to age into two groups :

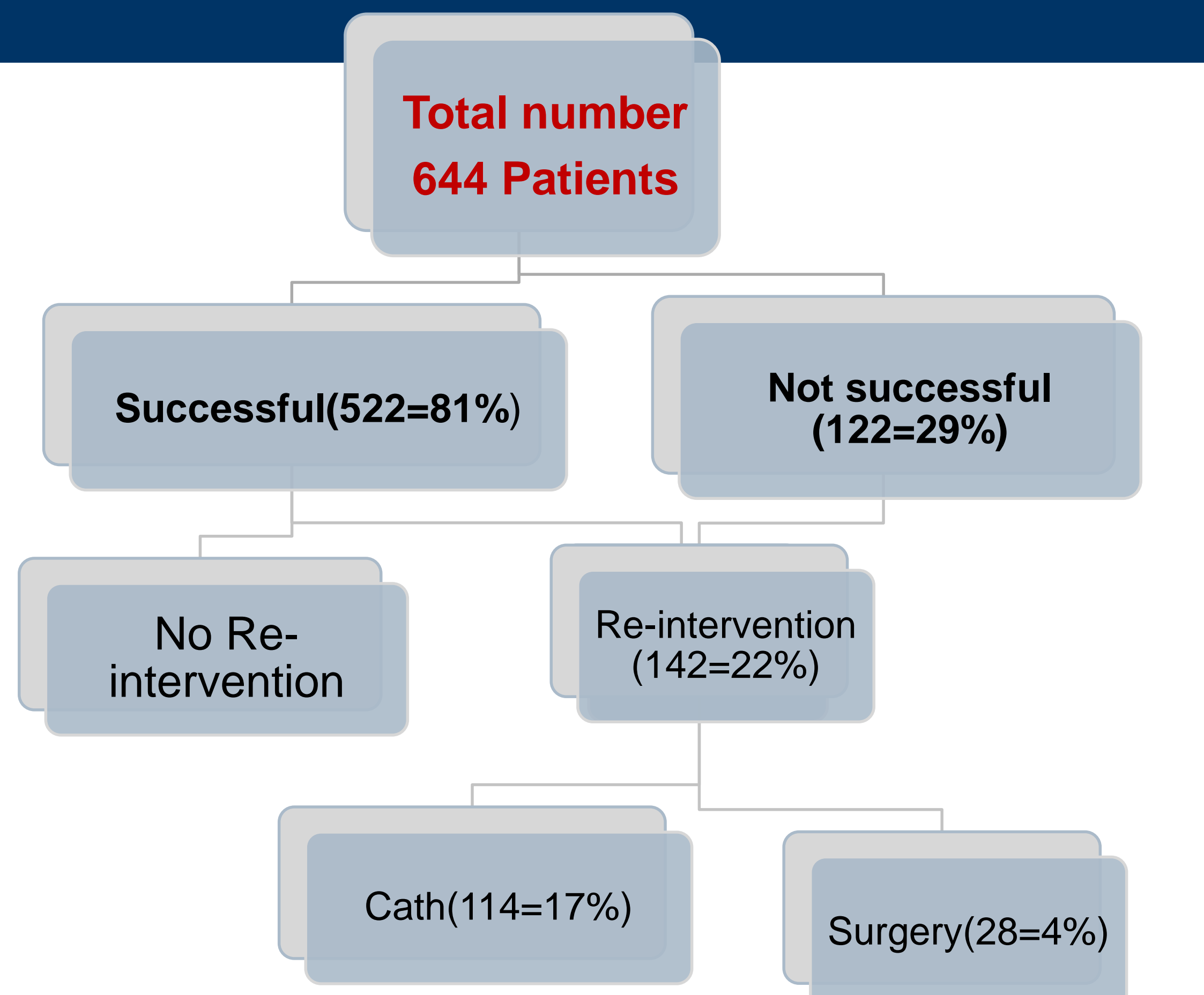
Neonatal and early infancy(n=282 , mean age 26.7 days±6.9, BW4.7±1.4 kg)

Infancy (n=362(30%), mean age 6.8 months ±2.7, BW7.3±1.3).

In 81% of the studied patients balloon dilatation was successful.

22% of patients required re-intervention .

Outcome of the studied patients

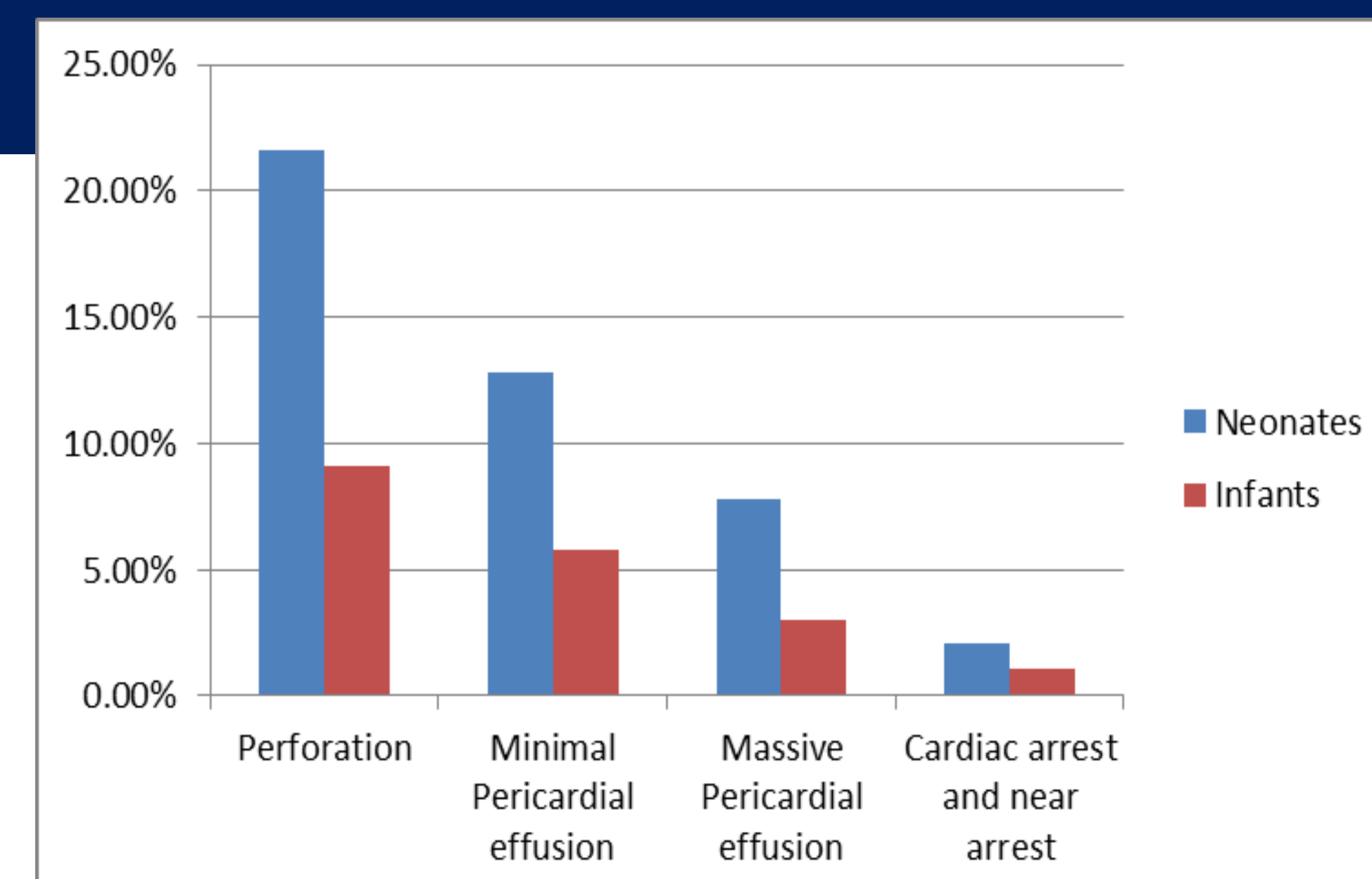


Predictors of Success

Variables measured	No Success	Success	P-Value
Age in days	133±96 d	134±87	0.89
Wt Kg	5.8±1.7	6.2±1.8	0.09
PG precath	94.2±26	91±25	0.4
PV annulus by Echo	8.2±1.8	8.8±2	0.015
RVP pre-cath	115.9±34	113.26±28	0.5
PAP pre-cath	21.73±6.4	23.32±9.1	0.11
RVP post-Cath	80±30	50±12	0.000
	53±26	24±98	0.000
PG post-Cath	10±2.5	10.9±2.7	0.05
Balloon Size			
Ballon/Annulus ratio	1.26±0.35	1.29±0.34	0.55

		Not Successful	Successful	P-Value
Infundibular stenosis	No	37(57.8%)	196(75.4%)	0.006
	Yes	27(42.2%)	64(24.6%)	
Critical PS	No	43(67.2%)	187(71.6%)	0.48
	Yes	21(32.8%)	74(28.4%)	
PV	Abnormal	5(7.8)	22(8.4%)	0.87
	Normal	59(92.2%)	239(91.6%)	

Complications of balloon dilatation

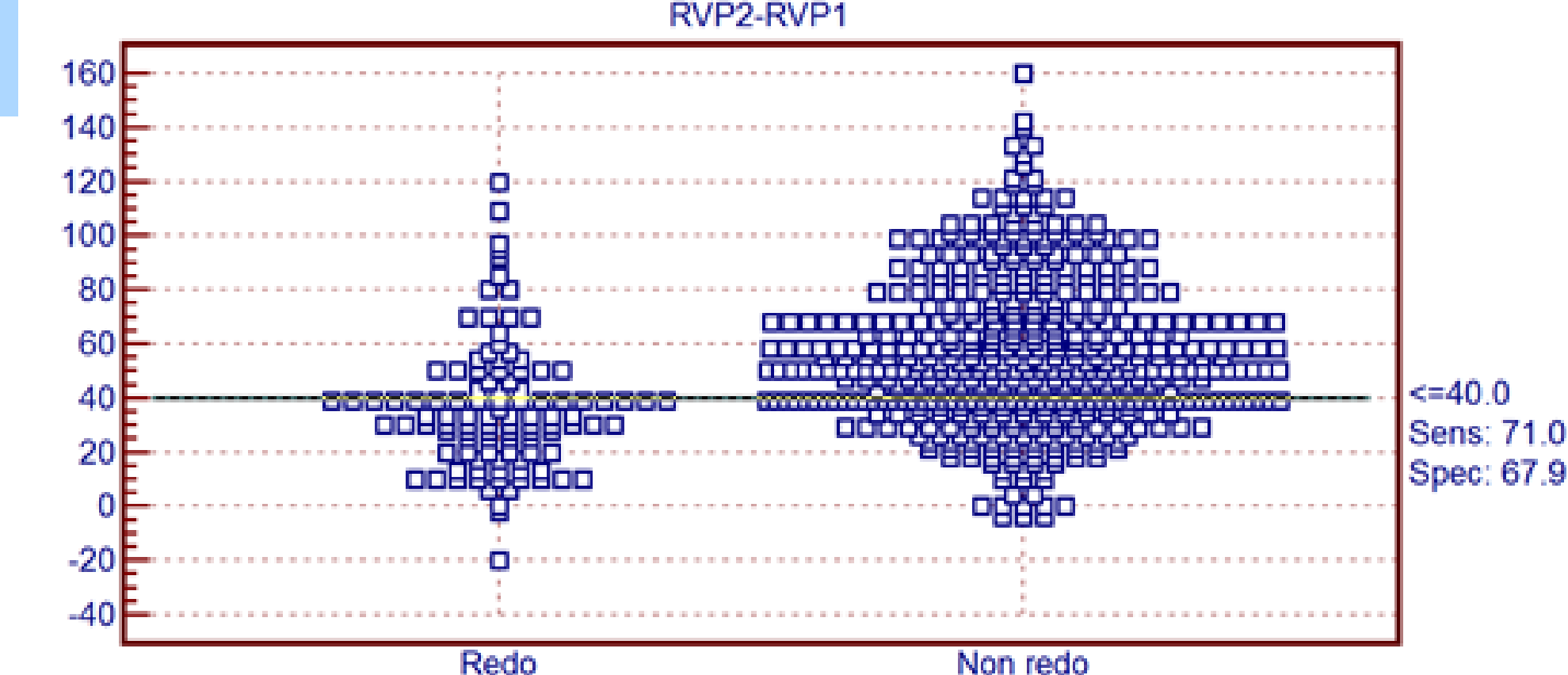
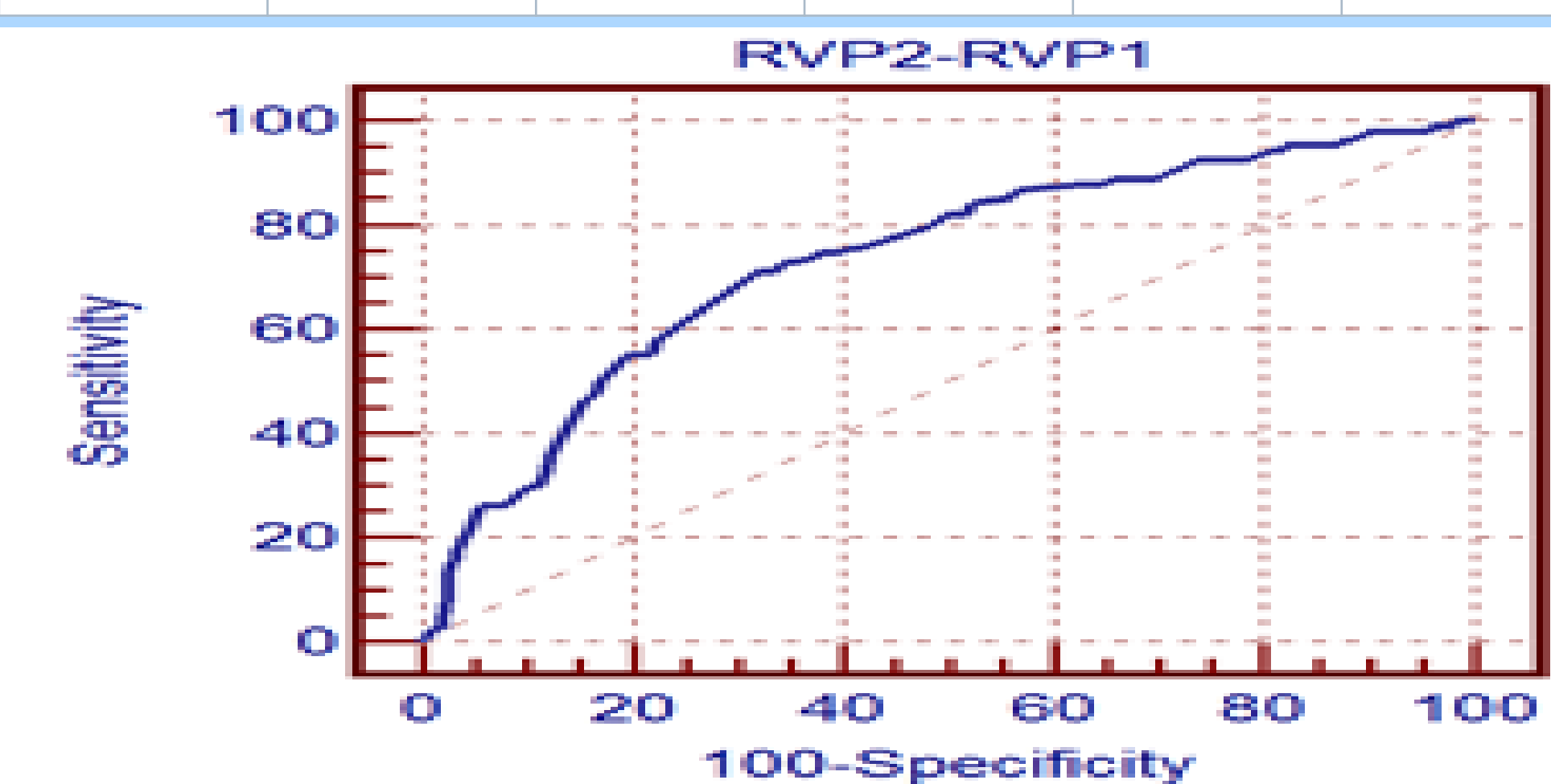


Predictors of Re-intervention

Several variables were studied and it was found that the Pulmonary valve annulus measurement and RV pressure post cath dilatation have statistically significant difference between cases underwent single trial and cases required re-do on short term F/U (P<0.005).

ROC curve between Redo (redo-Non redo) as regard RVP2-RVP1

Cut-off	Sens.	Spec.	PPV	NPV	Accuracy
<=40	71.0	67.9	32.2	91.6	73.3



Conclusion: The PV annulus size, RVP post cath, PG post cath, balloon size, absence of infundibular stenosis are strongly correlated to successfulness of BPV(P<0.05). A cut-off value of 40 mmHg drop of RV pressure is the most important predictor of re-intervention on short term F/U.



Acknowledgment:

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