

PSU

LIST OF PROCEDURES DONE
PROJECT REPORT

TITLE OF THE PROJECT: **EX VIVO EVALUATION OF
CHITRA TILTING DISC
VALVE .**

NAME.....**R.N. HYDRAIBADI**

PROGRAMME.....**M.CH. CVTS.**

MONTH & YEAR
OF SUBMISSION:.....**NOV. 1990**

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- Note:— (i) In the case compilation of procedures done, the contents and the subsequent pages should be made into different sections (a) Procedures done (b) Procedures assisted (c) Procedures participated (d) Procedures attended/participated etc in Other Centres. Each section should be preceded by a leaf carrying the name of the section that is succeeding.
- (ii) The Contents page will carry into, as per model given under

PROCEDURES DONE

Closed Mitral valvotomy.....124 (say)
 Patent ductus arteriosus-ligation.....10
 Atrial septal defects.....20

PROCEDURES ASSISTED

Closed Mitral valvotomy.....100 (say)

- (iii) In the subsequent pages details of each procedure done/assisted should be given in the format given below:—

Heading: **Closed mitral valvotomy**

Date	Name of the patient	Age	Sex	Patient No.
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- (iv) In the case of Project Report in the page immediately following the Certificate page the under-mentioned details should be given:—

- (a) Title
- (b) Duration
- (c) Aim and scope
- (d) 50 word summary of work done

CERTIFICATE

I, Dr. R.N. HYDRABADI hereby declare that I have actually performed all the procedures listed/carried out the project under report.

Signature R.N. Hydrabadi

Place: Trivandrum

Name in R.N. HYDRABADI

Date: 18.11.90 capital letters

R.N. Hydrabadi
24.11.90.

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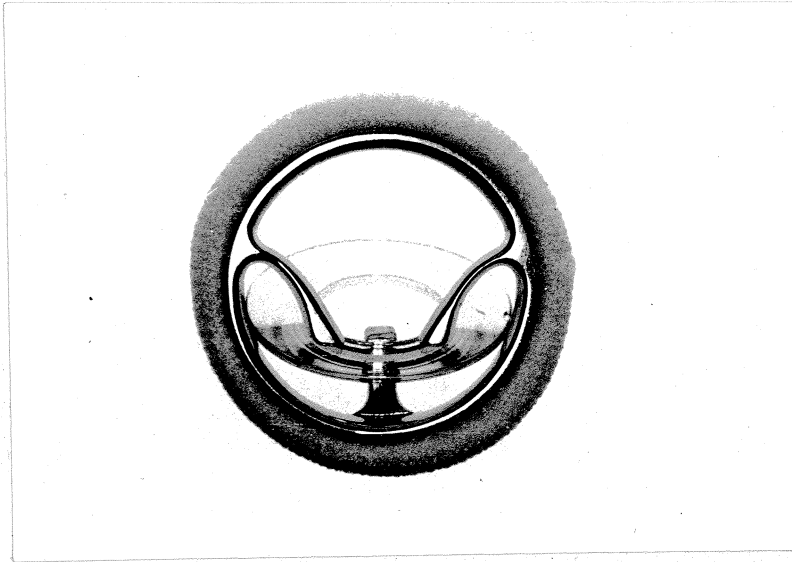
EX vivo evaluation OF CHITRA
Tilting Disc. valve in Mitral
Position in Four sheep.

Name

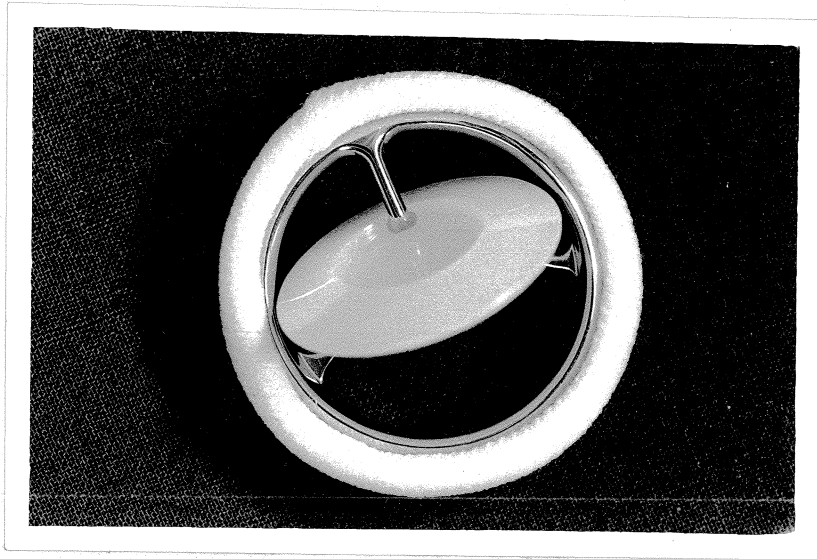
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Chitra tilting Disc valve
with Sapphire Disc.



Chitra tilting Disc valve
with UHMW Polyethylene
Disc.

INTRODUCTION

Chitra Heart Valve prosthesis is a low profile mechanical tilting disc valve designed and fabricated at the Biomedical Technology wing of our Insitute.

The valve consists of a sapphire disc (hardest material next to diamond) in a titanium fabricated housing with polyester cloth sewing ring. Surface of the Titanium cage was made harder by Nitriding.

A new model under trial is a tilting disc prosthesis with a disc made of Ultra High Molecular Weight Polyethylene (UHMW) in a housing made of Haynes alloy.

All models undergo accelerated wear testing of hydraulic function (durability) in a pulse deuplicator. A 250 million cycles corresponded to 6 years of extra corposeal function.

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COMPARISON WITH BJORK SHILEY PROSTHESIS

1. Hydraulic performance in pulse duplicator was slightly superior.
2. Accelerated wear testing was same as BSP

CRITERIA	23 MM CHITRA	23 MM BSP STANDARD DISC
OPENING ANGLE	70	60
DISC THICKNESS	1.4 MM	2 MM
STRUTS	NO BRIDGES (Less amount of metal in the flow path)	
DIASTOLIC LEAK	ACCEPTED	ACCEPTED

This report consists of four animal experiments participated as part of the ongoing exvivo evaluation programme of the department.

Mitral valve replacement was done in sheep using Polystan bubble oxygenator.

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MATERIAL AND METHOD

PRE OP PREPARATION

Animals were weighed and preconditioned. Complete hemogram, coagulation profile, renal and liver function tests were done as basal. Animals were fasted for 24 hours. Fluids were restricted for 12 hours before operation. 1 gram Neomycin sulfate was administered orally 12-14 hours before operation.

PRE MEDICATION

Atropine 0.1 mg per kg body weight was given 1 m one hour before operation as premedication.

ANAESTHESIA

General anaesthesia was induced with 2.5% intravenous Thiopentone Sodium. The animal was intubated in left lateral position. GA was maintained with repeated small doses of thiopentone and scoline.

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INTRA OP MONITORING

EKG was monitored throughout the procedure. Continuous arterial BP and CVP were monitored by cannulating Left common Carotid Artery and Left Internal jugular vein. A prepuccial catheter was kept to measure the urine out put.

THE OPERATION

The animal was positioned and draped in right lateral position. A left lateral thoracotomy was performed through the 5th Left Intercostal space. Systemic Heparinisation was done by giving 3 mg per kg body at Heparin intravenously. Cardio pulmonary bypass was established by cannulating descending Thoracic Aorta and main Pulmonary Artery (into RVOF). Core cooling was done upto 30 C and heart was fibrillated with a fibrillator. Left atrium was opened obliquely. The mitral valve was excised and replaced with No.23 CHITRA VALVE using interrupted 000 Ethibound sutures. The disc motion was checked and Left Atrium was then repaired in layers.

Animal was rewarmed. Heart was defibrillated and cardiopulmonary bypassed was weared off. Heparin was

reversed with protamine (6mg/kg). Thoracotomy was repaired in layers with a pleural drain.

POST OPERATIVE

The animal was nursed in prone position on the table for a few hours and was extubated when fully recovered from anaesthesia. The monitoring lines, chest tube and urinary catheter were removed and animal was brought down to the floor. Intravenous fluids were continued. Oral feeds were given from the first post operative day. Streptomycin 500 mg and Procaine penicillin 4 lakhs were given intramuscular and continued for five days.

PARAMETERS MONITORED

CLINICAL

HR BP CVP RESPIRATION URINE TEMP LEVEL OF CONSCIOUSNESS

LEVEL OF CONSCIOUSNESS

CORNEAL REFLEX PAIN REFLEX HEADLIFTING

TAIL MOVEMENTS SWALLOWING REFLEX

HEMATOLOGICAL

Hb Plasma Hb Platelet count

~~total~~ WBC count Reticulocyte count

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BIOCHEMICAL

ELECTROLYTES

BUN

BILIRUBIN

LDH

PROCEDURES ASSISTED

DATE	PROCEDURE	ANIMAL NO.	VALVE
12.12.89	MVR In Sheep	23209	23 mm UHMW Disc
14.12.89	''	23211	''
15.12.89	''	23208	''
23.03.88	''	04	23 mm Sapphire Disc

OBSERVATIONS AND RESULTS

SHEEP NO. 01

After Defibrillation paravalvular leak was suspected by thrill over LA Heart was Fibrillated again, LA opened, Leak found at 10 O'Clock position and was repaired. But the thrill reappeared after coming off CP bypass hence animal was sacrificed on table.

INSPECTION OF THE VALVE

Valve function was normal annulus had a 5 mm tear at 6 O'clock position with paravalvular leak

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IMPRESSION:

TECHINICAL FAILURE

Sheep No.2

The procedure was uneventfull.
Post operative recovery uneventful
Sheep alive and well after 11 months
Not on any auticoagulants.
No evidence of paravalvular leak.
Prosthesis function normal.

Investgations one month post OP

Hb 12.2 gm%
PCV. 36%
JLC 10,800
S.Bil 0.4 Mg/Dl
Plasma HB 22.8 mg%
Reticlocytes Nil

Sheep No. 3.

The Mitral annulos of the sheep was small and only 23 size valve was available. Valve was placed

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with some difficulty. But surprisingly the animal did well and is alive and well 11 months after the procedure on no anticoagulants. Prosthetic valve functions well. There is no evidence of paravalvular leak or LV outflow obstruction.

SHEEP NO. 04

The procedure was uneventful

PARAMETERS MONITORED

	PRE OP	PO 1	PO 18
HB	9.6	8.4	8.4
PCV	32	26	24
TOTAL WBC'S	13,700	13,600	7,300
PLATELET COUNT	349,000	231,000	347,000
RETICULOCYTES	0%	0%	0%
BUN	15	35	25
BILIRUBIN	0.8	0.5	0.4
PLASMA HB	-	3.7	2.3
LDH	154	774	416

Animal is doing well now

Prosthetic valve function is normal

No evidence of any paravalvular leak is found

Animal is not on any anticoagulants

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