

Mitral Balloon Valvuloplasty
in the era of TAVI/Mitra Clip
The Addis Ababa Mitral stenosis
project, a technology transfer
experience

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Conflict of Interest

- NONE

Global Burden of Cardiovascular Diseases
Part I: General Considerations, the Epidemiologic Transition, Risk Factors, and Impact of Urbanization

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TABLE 1. Modified Model of the Stages of Epidemiologic Transition as it Pertains to Cardiovascular Diseases

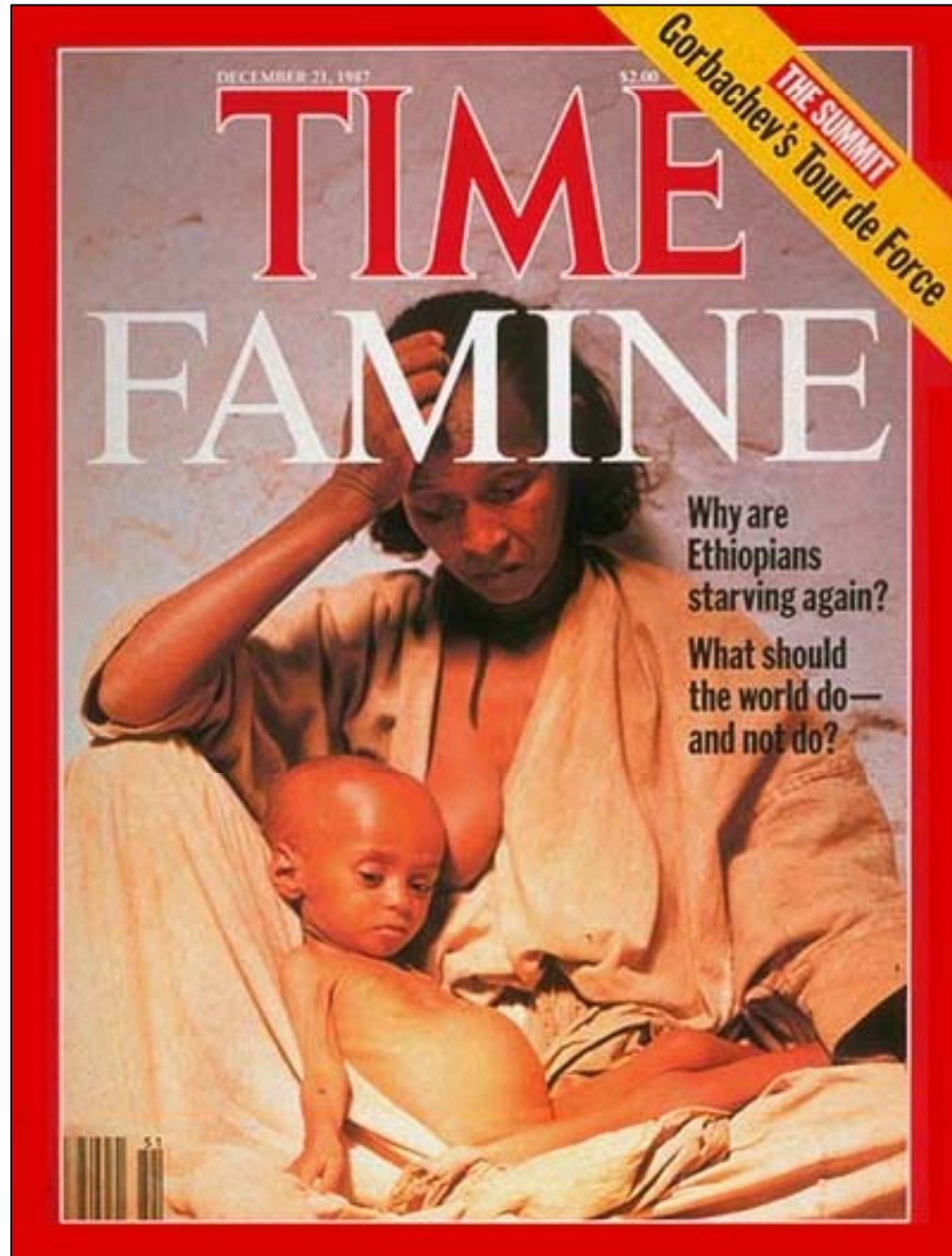
Stages of Development	Deaths From CVD, % of Total Deaths	Predominant CVDs and Risk Factors	Regional Examples
1. Age of pestilence and famine	5–10	Rheumatic heart disease, infections, and nutritional cardiomyopathies	Sub-Saharan Africa, rural India, South America
2. Age of receding pandemics	10–35	As above+hypertensive heart disease and hemorrhagic strokes	China
3. Age of degenerative and man-made diseases	35–65	All forms of strokes, ischemic heart disease at young ages, increasing obesity, and diabetes	Urban India, former socialist economies, aboriginal communities
4. Age of delayed degenerative diseases	<50	Stroke and ischemic heart disease at old age	Western Europe, North America, Australia, New Zealand
5. Age of health regression and social upheaval	35–55	Re-emergence of deaths from rheumatic heart disease, infections, increased alcoholism, and violence; increase in ischemic and hypertensive diseases in the young	Russia

project mitral stenosis-background

- rheumatic fever, incidence 2-50/100 000, insufficient data from African countries
- rheumatic heart disease
 - global prevalens: 20 million
 - mitral valve always affected (MS/MR)
 - aortic valve affected in 20-30%
 - tricuspid valve disease usually subclinical
- rheumatic mitral stenosis
 - latency 2-40 years
 - congestive heart failure
 - stroke
 - AF
 - pulmonary hypertension



1987



2011



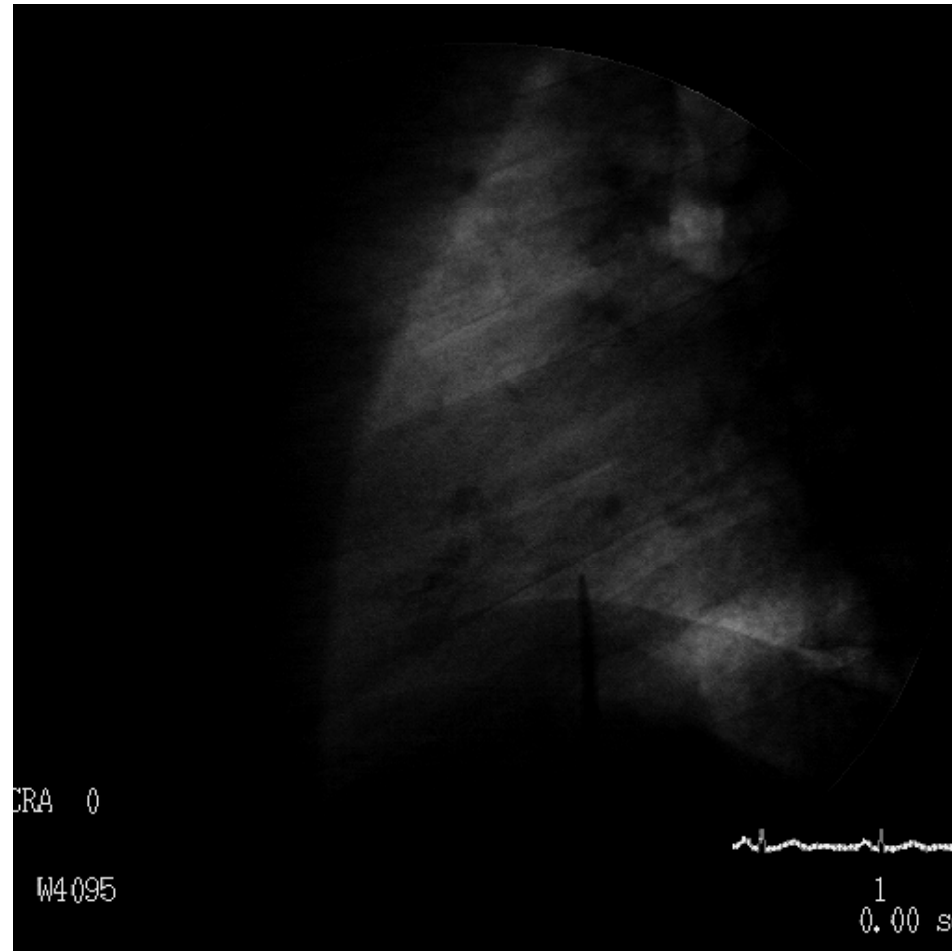
- Ethiopian/Swedish/Egyptian collaboration, operation Mitral Stenosis, part of larger operation involving surgery .
- Started by training in Cairo December 2010 where a Swedish/Ethiopian team trained at NHI for one week performing cases of MBV using the Inoue technique for the first time.
- Continued in Addis Ababa, as of today 18 cases performed all using the same balloons used in Cairo after reesterilization..



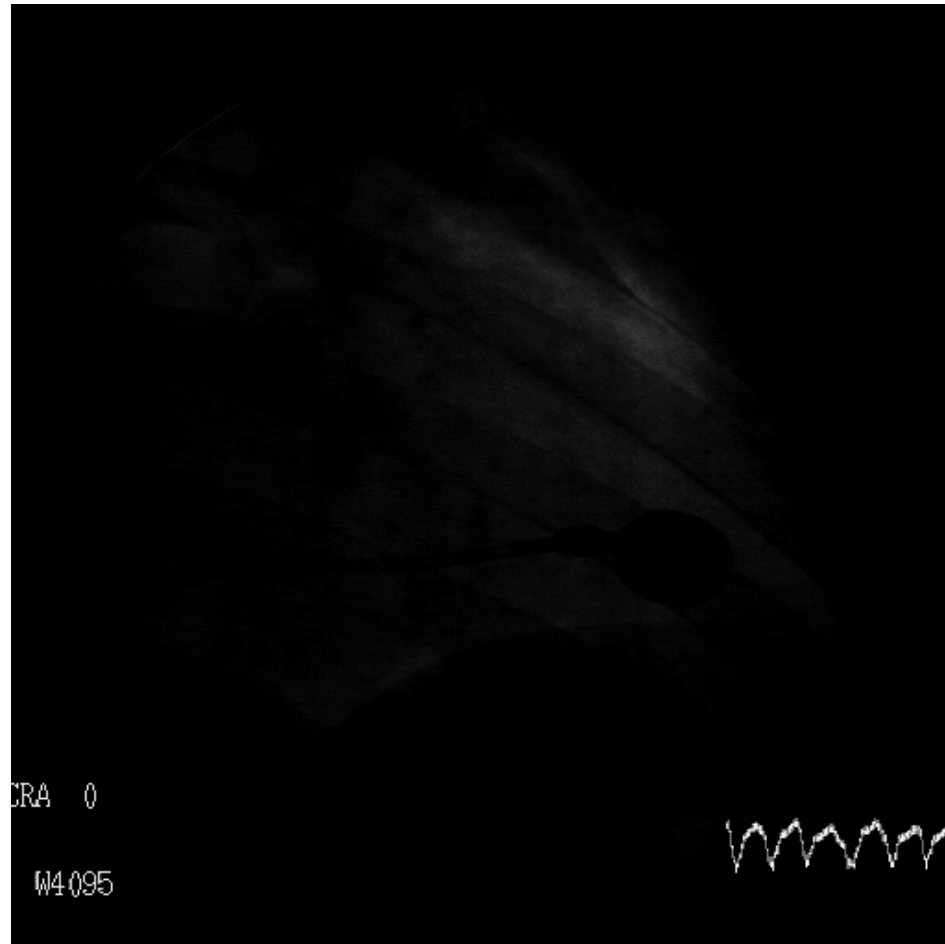




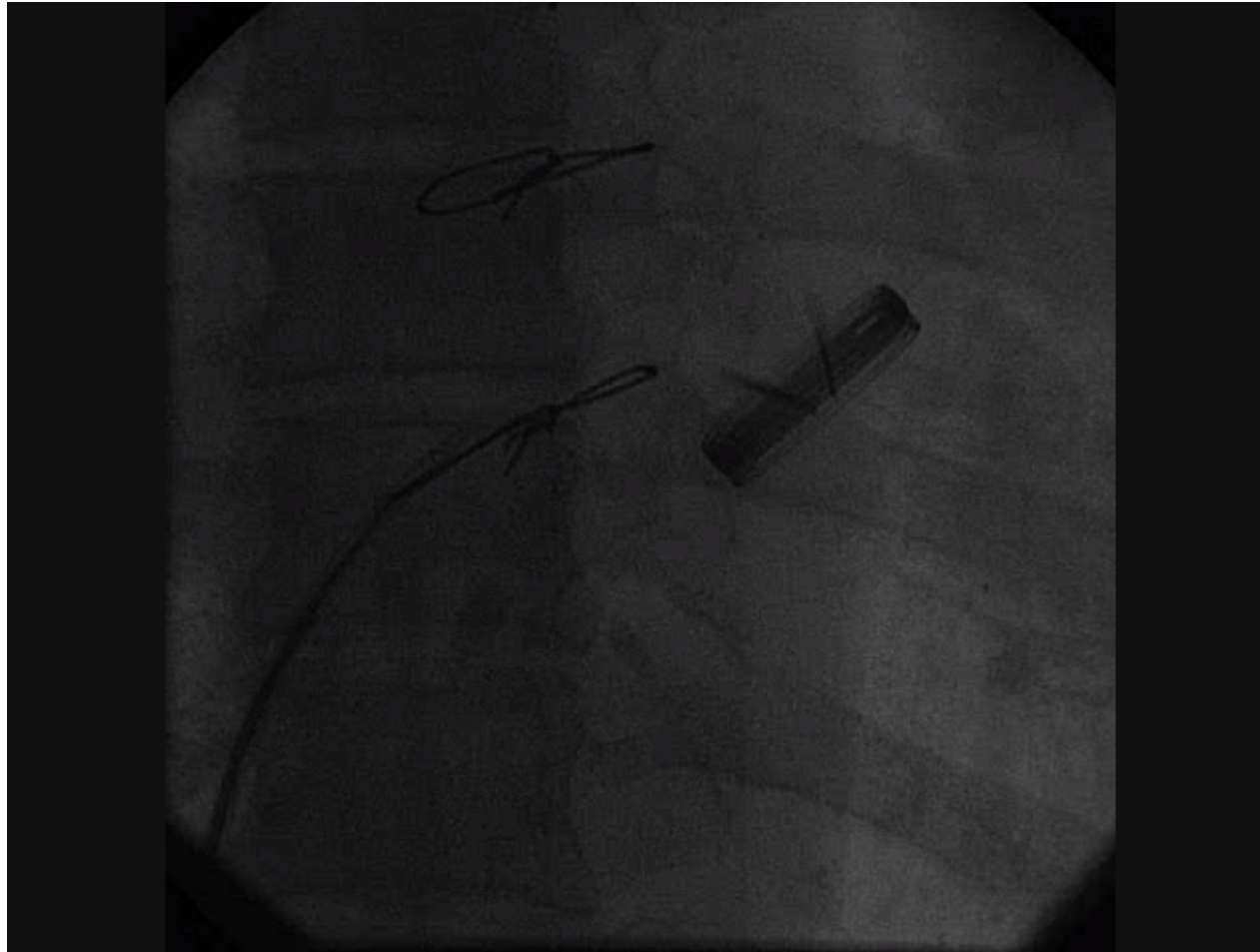
Learning @Imbaba the septostomy



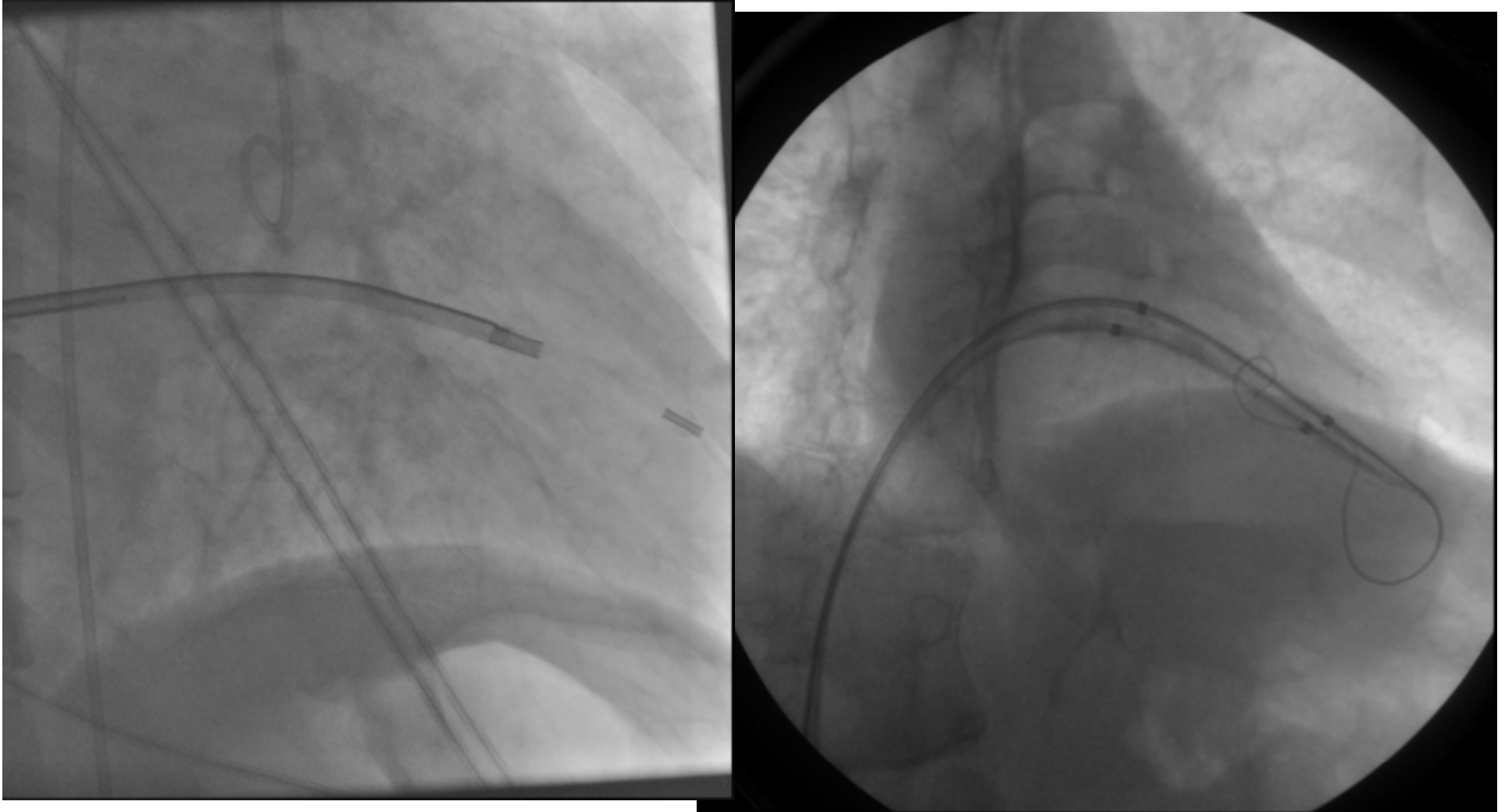
Learning @Imbaba, the MBV
Why, Imbaba Egypt? Many daily
patients ,Very few limits in MBV



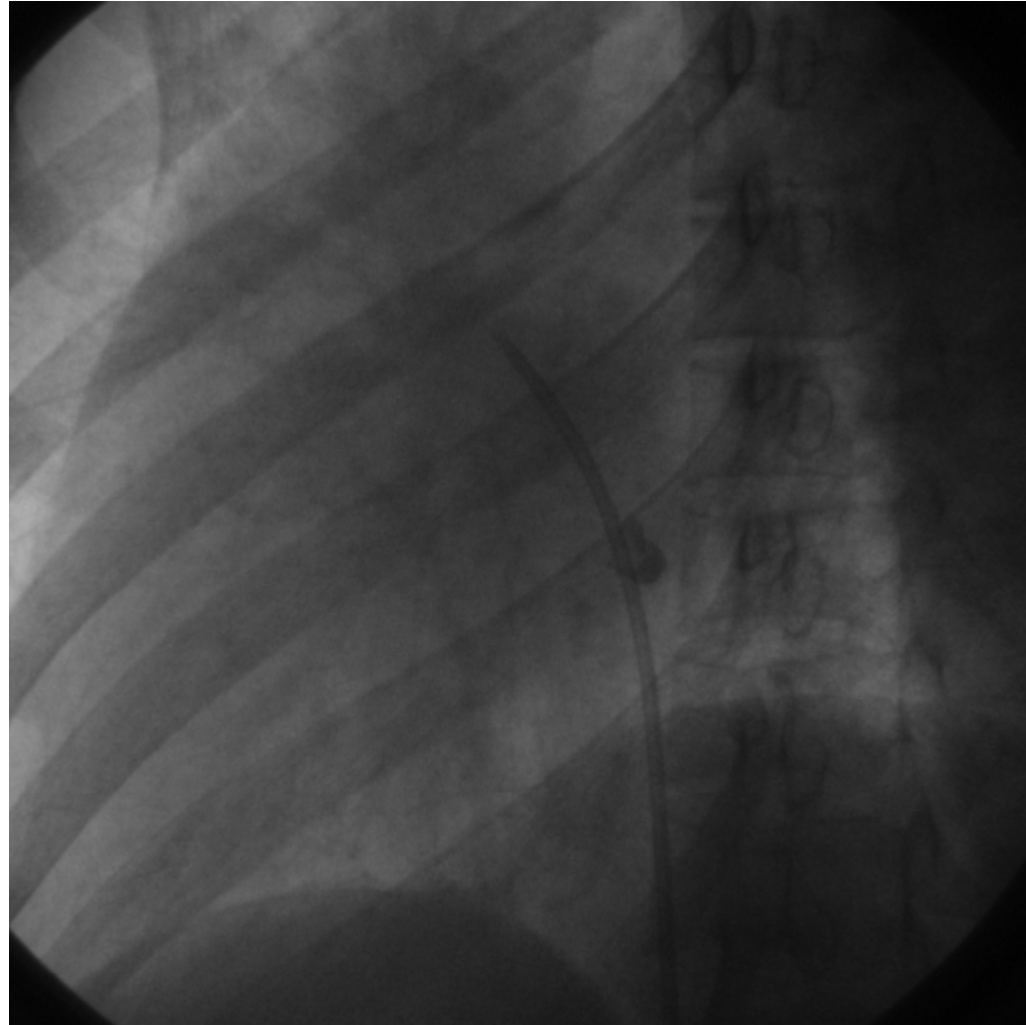
Case Examples, MBV post AVR, giant LA, previous failure



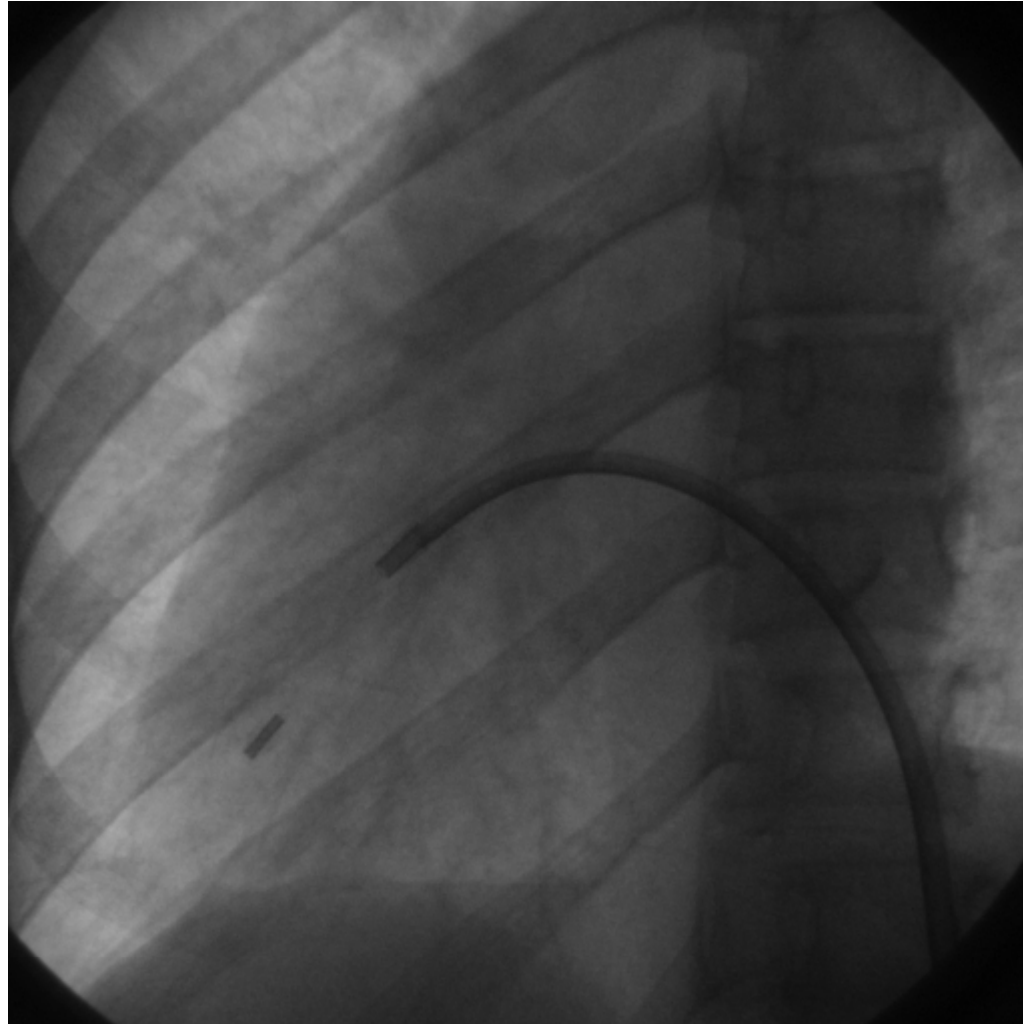
all techniques used, Inoue, double balloon,
Multitrack, abandoned the Metal Valvulotome



MBV for all : MBV in Situs Inversus



Situs Inversus



Few limits: Echo guided MBV in early pregnancy without Xray



Solely Echo guided septostomy

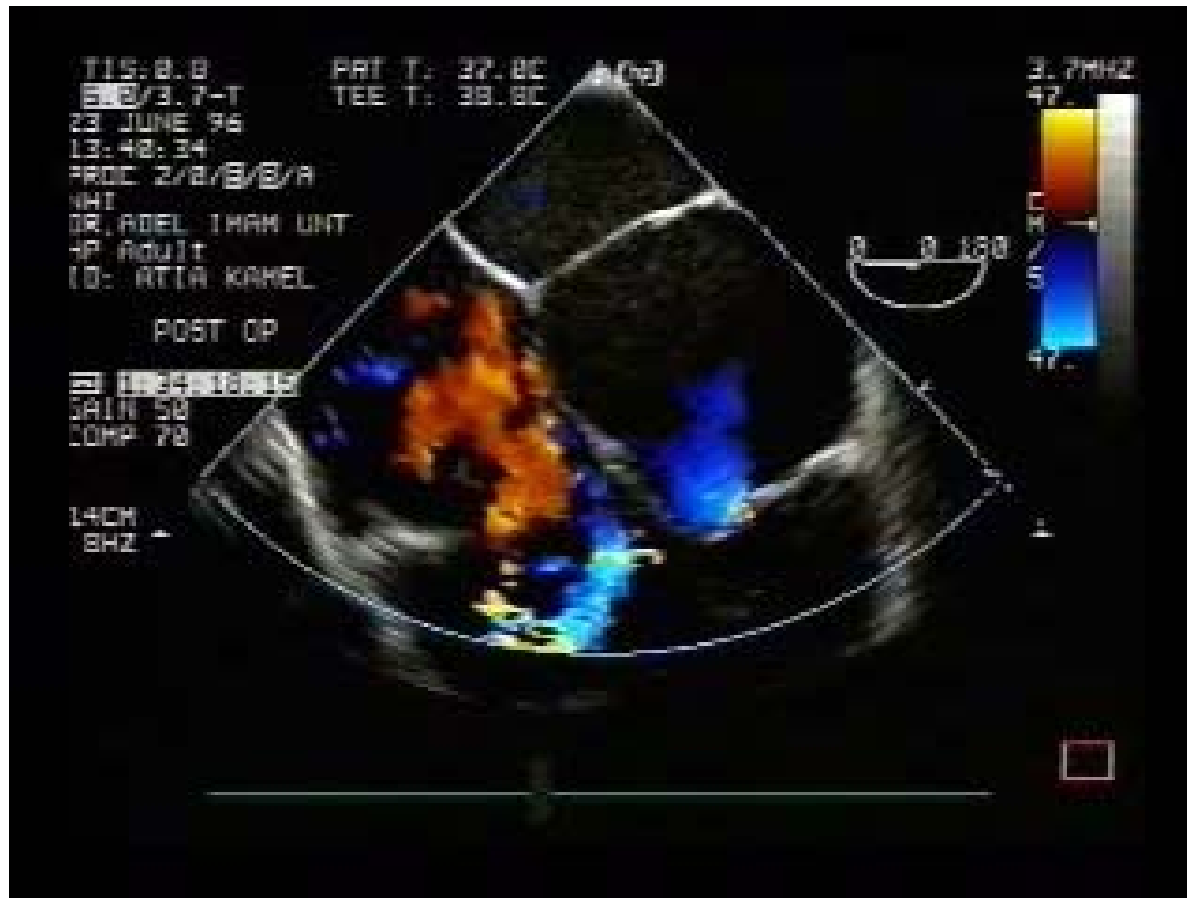


The valvuloplasty balloon as it is inflated across the MV (contd.)

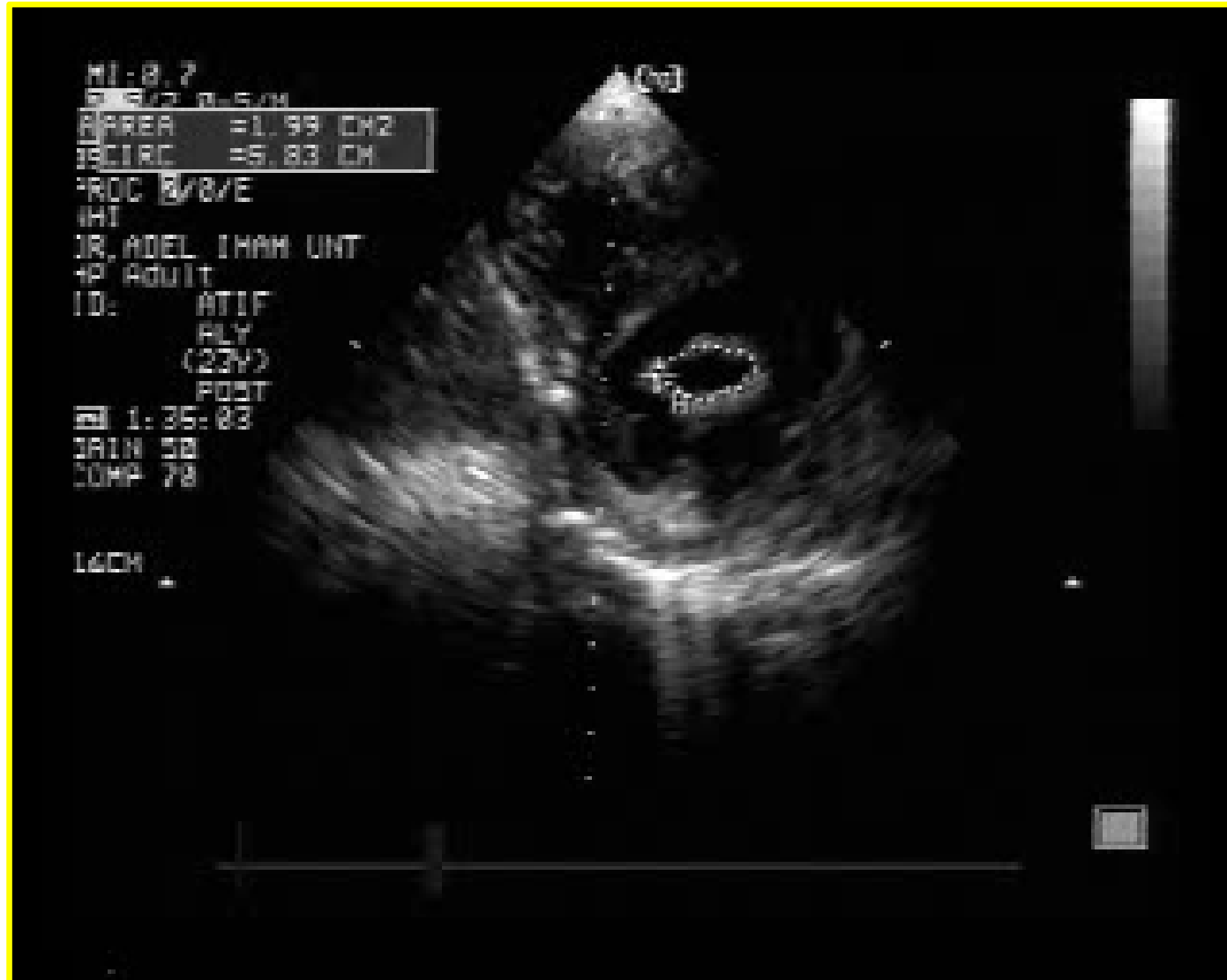


MVA = 1.6 cm² & mean pressure gradient = 5 mmHg

Associated conditions, MBV in Cor Tri triatum



TEE apical 4-chamber view shows a clear membrane dividing left atrium into two chambers



MVA = 1.9 cm² & diastolic pressure gradient = 14/7 mmHg

balloon mitral valvuloplasty, ACH, 2011

- training in Cairo dec 2010
- first case ever in Ethiopia april 11, 2011
- until today 18 cases
- Last 5 cases performed mainly by Ethiopian team, transfer of knowledge.

- 11 female, 7 male
- age: mean 31.8 (range 14 – 51)

- NYHA-class: mean 2.3 (range 2 – 4)
- AFib: 33% 4 patients with previous stroke history
- medications:
 - diuretics: 72%
 - digitalis: 22%
 - warfarin: 44%
 - betablocker: 78%
 - antibiotics: 72%

balloon mitral valvuloplasty, ACH, 2011

- mitral valve:
 - area: mean 0,8 cm² (range 0,4 – 1,3)
 - mean gradient: mean 19 mmHg (range 10 – 36)
 - valve score: mean 7,8 (range 5 – 9)
- pulmonary hypertension: 78%
- preop TEE performed 100%
 - organized thrombus: 2 pts (11%)
 - smoke: 3 pts (17%)

BMV, ACH, 2011; procedure

- Inoue balloon
- size: 4 x 24 mm, 10 x 26 mm, 4 x 28 mm
- all cases evaluated with V-scan echocardiography after each inflation
- stepwise inflations stopped due to new/increased MR: (5 cases)
- Stepwise inflation stopped if splitting of commissures adequate in PSSAX
- no of inflations: mean 2.1 (range 1 – 4)
- procedural complications (MACE,Stroke, Bleeding, severe MR): 0
- 1 simultaneous MS and TS dilatation in presence of large LA thrombus
- 1 PBV thrown in for good measure!
- Both last 2 cases NYHA class 3- 4 very sick patients

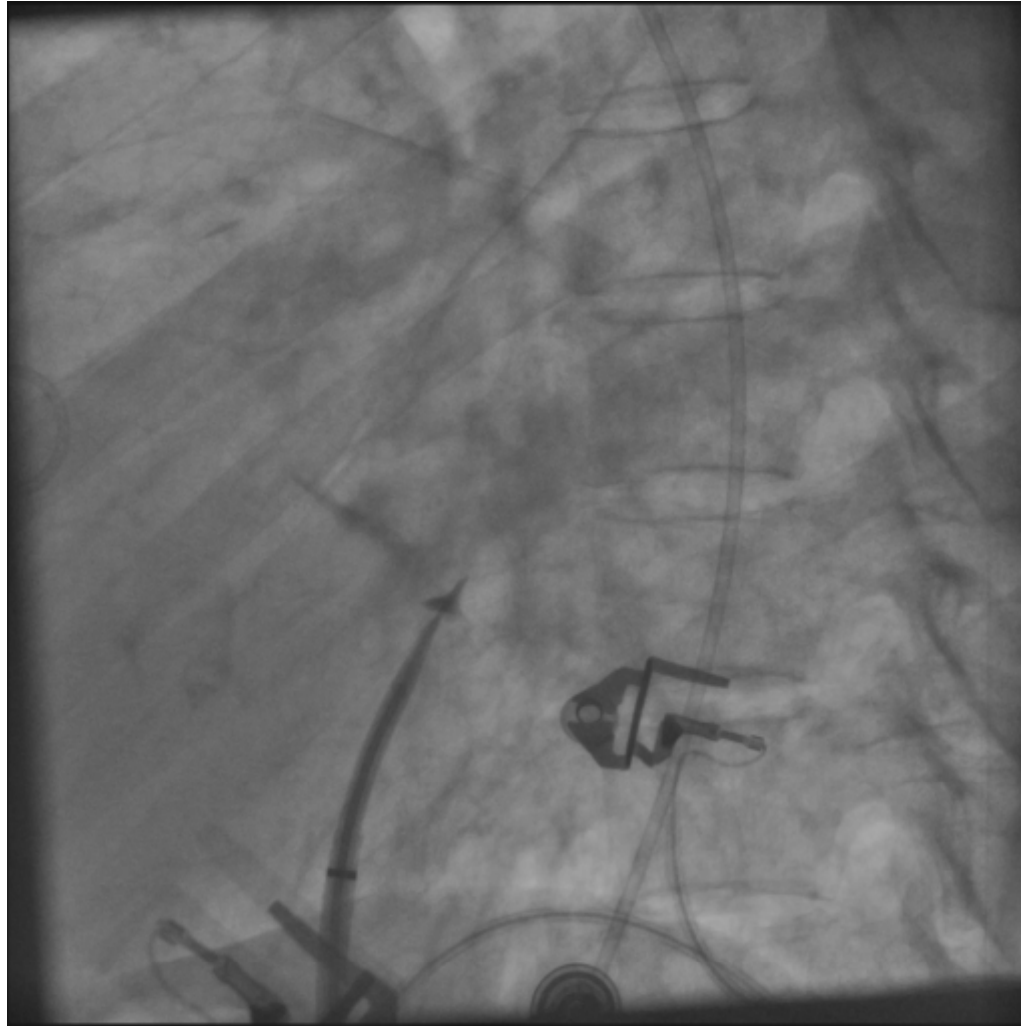
BMV, ACH, 2011; evaluation day 1

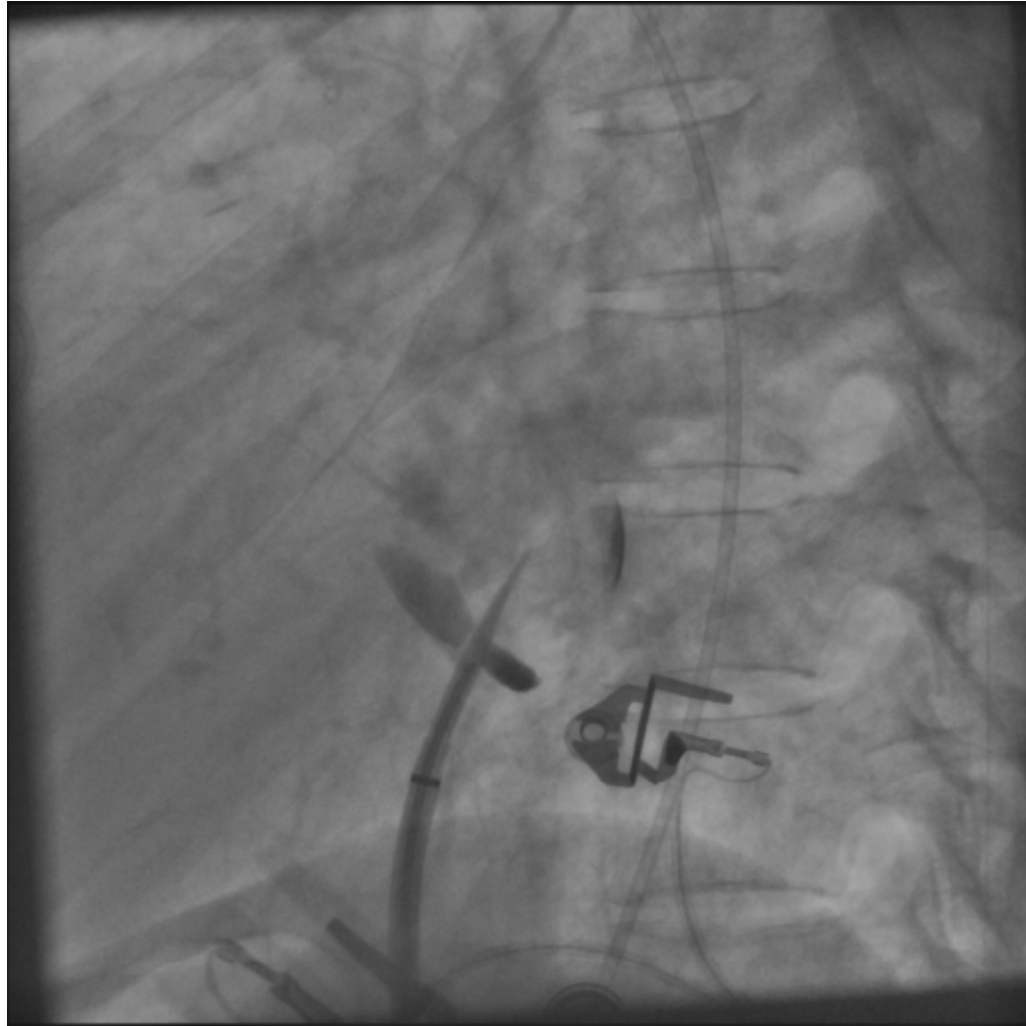
- echocardiography:
 - valve area: mean 1.84 cm² (range 1.2 – 2.4)
 - mean gradient 5.3 mmHg (range 3 – 13)
 - MR: 4 pts increase 1 (4 step scale), 1 pt increase 2
 - MR > 2/4: 0
- success: 83% (15 of 18)
 - definition: MVA increase > 50% and > 1.5 cm², and mean gradient < 10 mmHg
- all pts had area increase > 50%
- all 3 pts not meeting above criteria had > doubling of valve area

BMV, ACH, 2011; evaluation 1-3 months

- 11 pts
- all NYHA 1
- mean NYHA improvement: 1,5 (range 1 – 3)
- echo findings unchanged

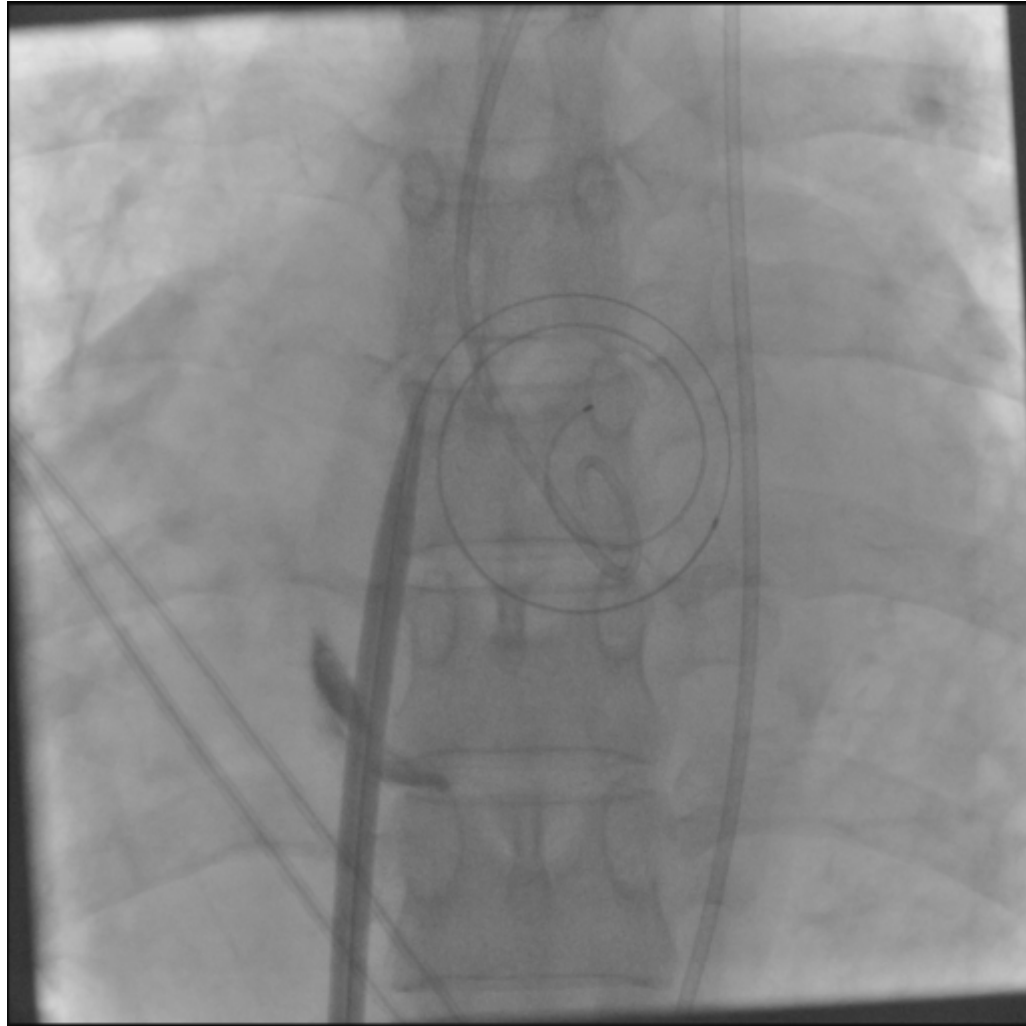
Teaching septostomy using atrial flush/stain technique





Lateral image showing septostomy using septal stain technique

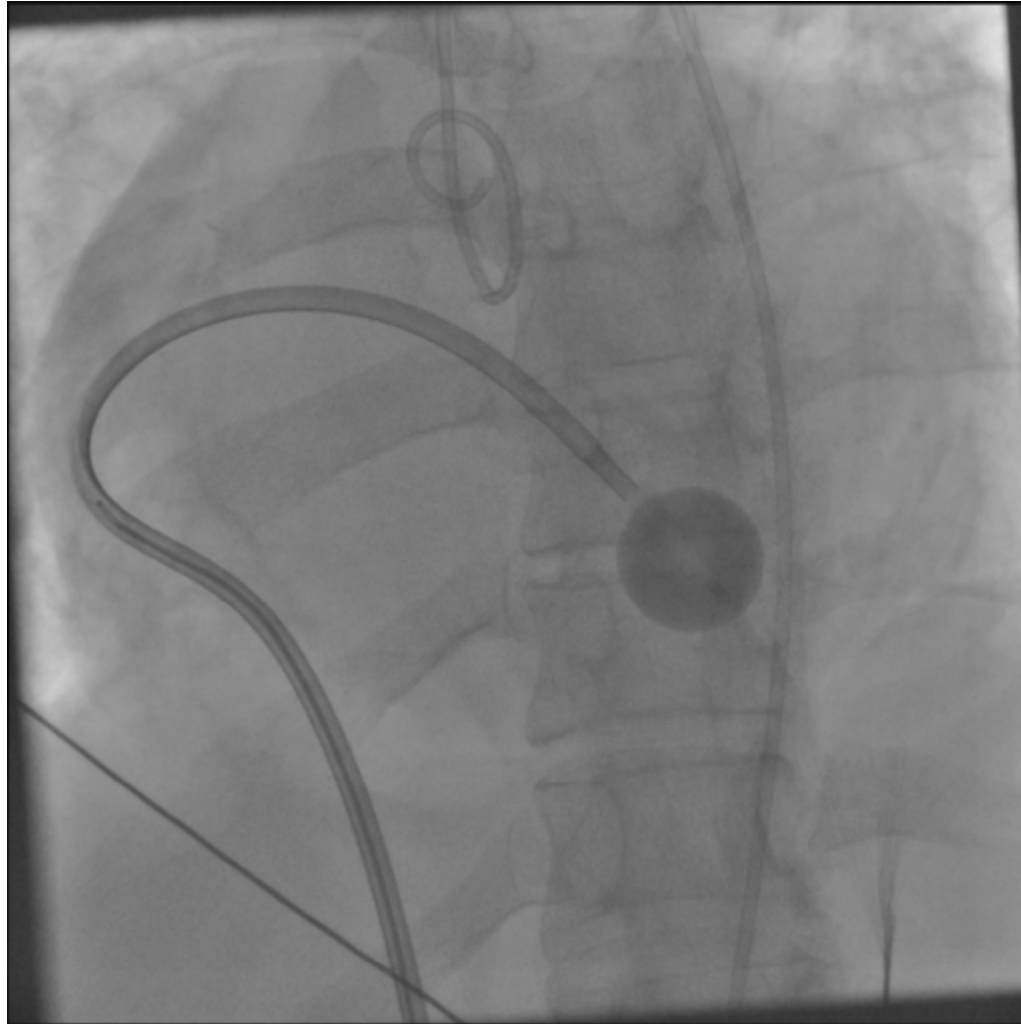




Stepwise increase in size guided by
echo till full size +1 mm



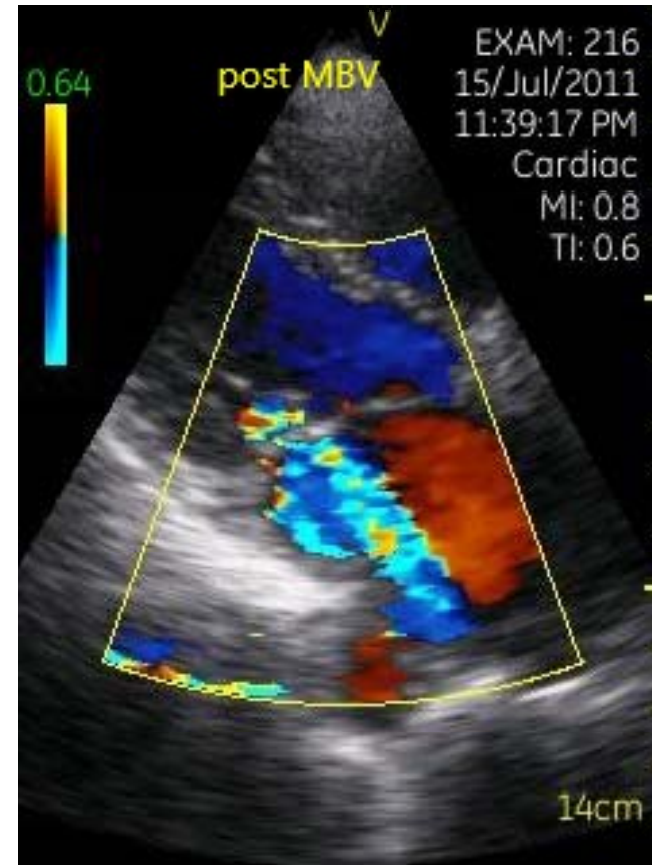
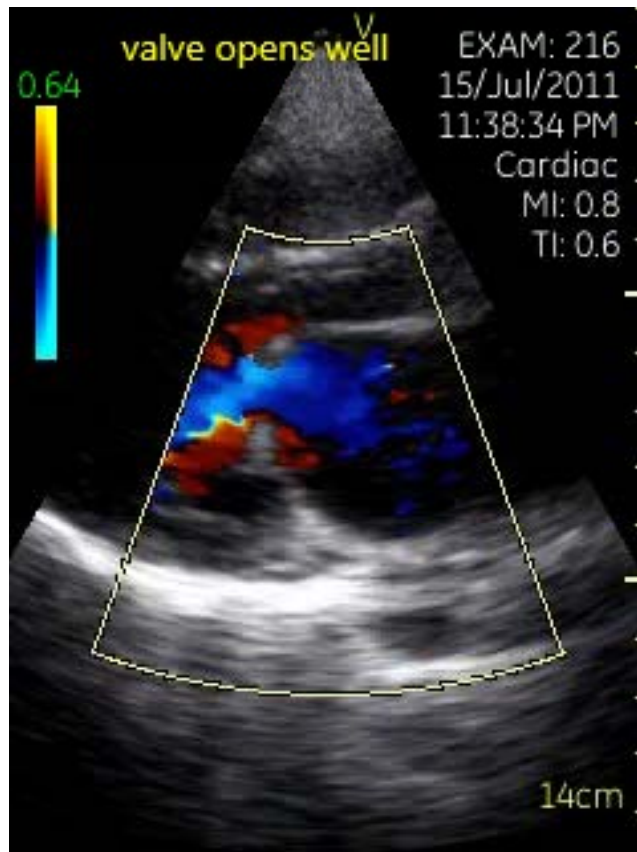
Breaking limits in Addis's early experience. Associated TV stenosis!



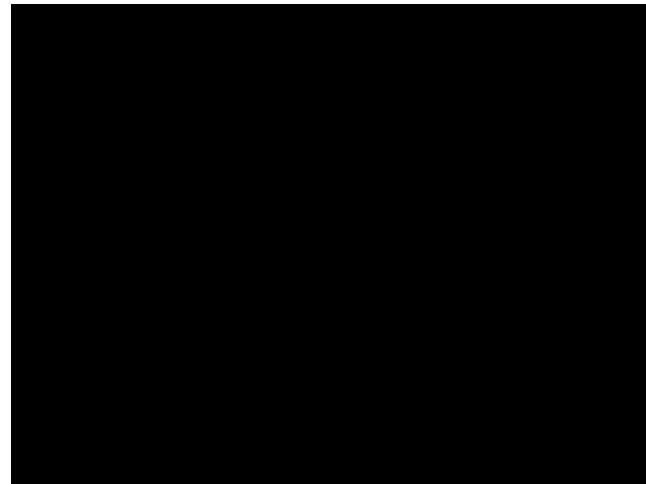
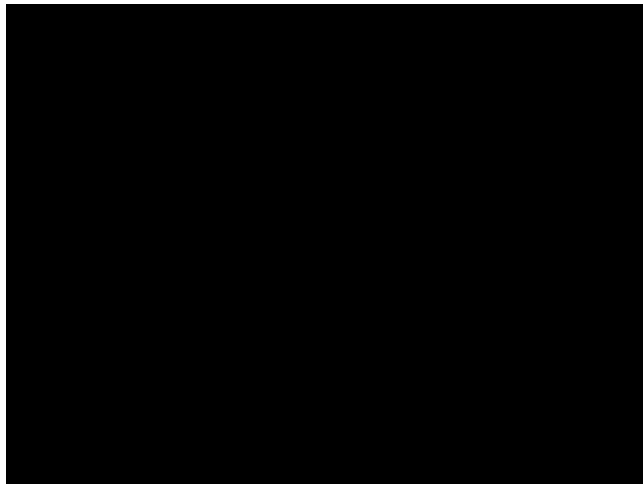
Using Hand Held echo (Vscan) to make up for absence of pressure recording & injector



V Scan showing adequate MV opening post MBV, and some MR

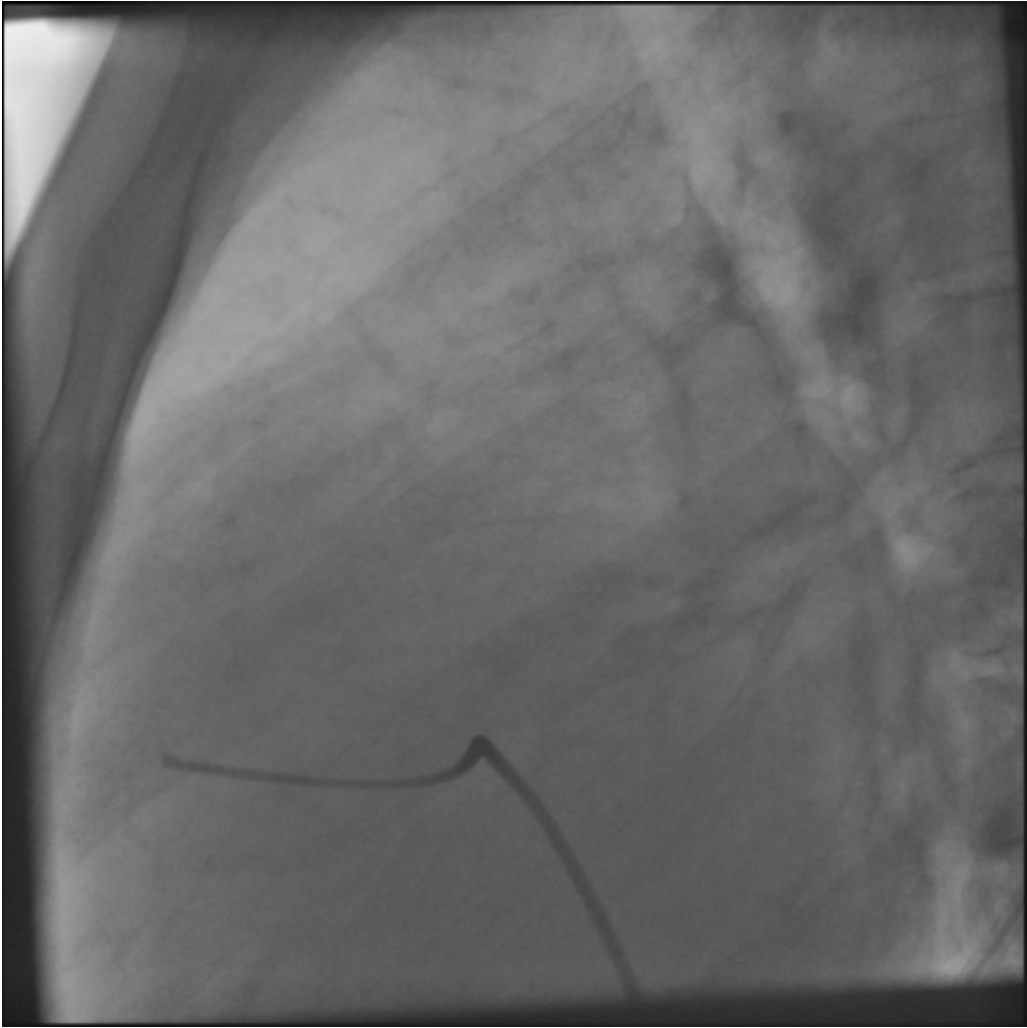


MS, TS pre and post showing spontaneous
echo contrast & thrombus pre MBV , and
echo post procedure



case: congenital pulmonary valve stenosis on Day 2 in Addis

- male 27 yrs
- severely symptomatic, NYHA 4, cyanotic, CHF
- echo:
 - valvular PS, gradient > 150 mmHg,
 - severe RVH
 - ASD with R-L shunt-scheduled for open heart surgery
- pulmonary balloon valvotomy, 25 mm balloon
 - SAO₂ immediately from 63 – 99%
 - cyanotic fingernails turned red
 - 3 month follow: up NYHA I (Truck driver!), acyanotic, gradient 20 mHg



No ASD, just a PFO



Crossing the PV, MP catheter and Terumo Glidewire



PBV



Conclusion

- There is a wide rift in the quality of medical care between the developed and the developing worlds.
- While we aspire to improve the quality of life for elderly patients, with palliative expensive procedures (like TAVI); let us not forget that there are thousands of young, otherwise healthy patients, in poor nations specially sub saharan africa who are both miserable and/Or dying of valve disease which WE can easily palliate with minimal effort and cost (\$3000 per patient?!) we need someone to organize this-no industry interest.