SOCIETÀ ITALIANA DI ECOGRAFIA CARDIOVASCOLARE

Utilità dell'echo nella gestione della gestante con valvulopatia

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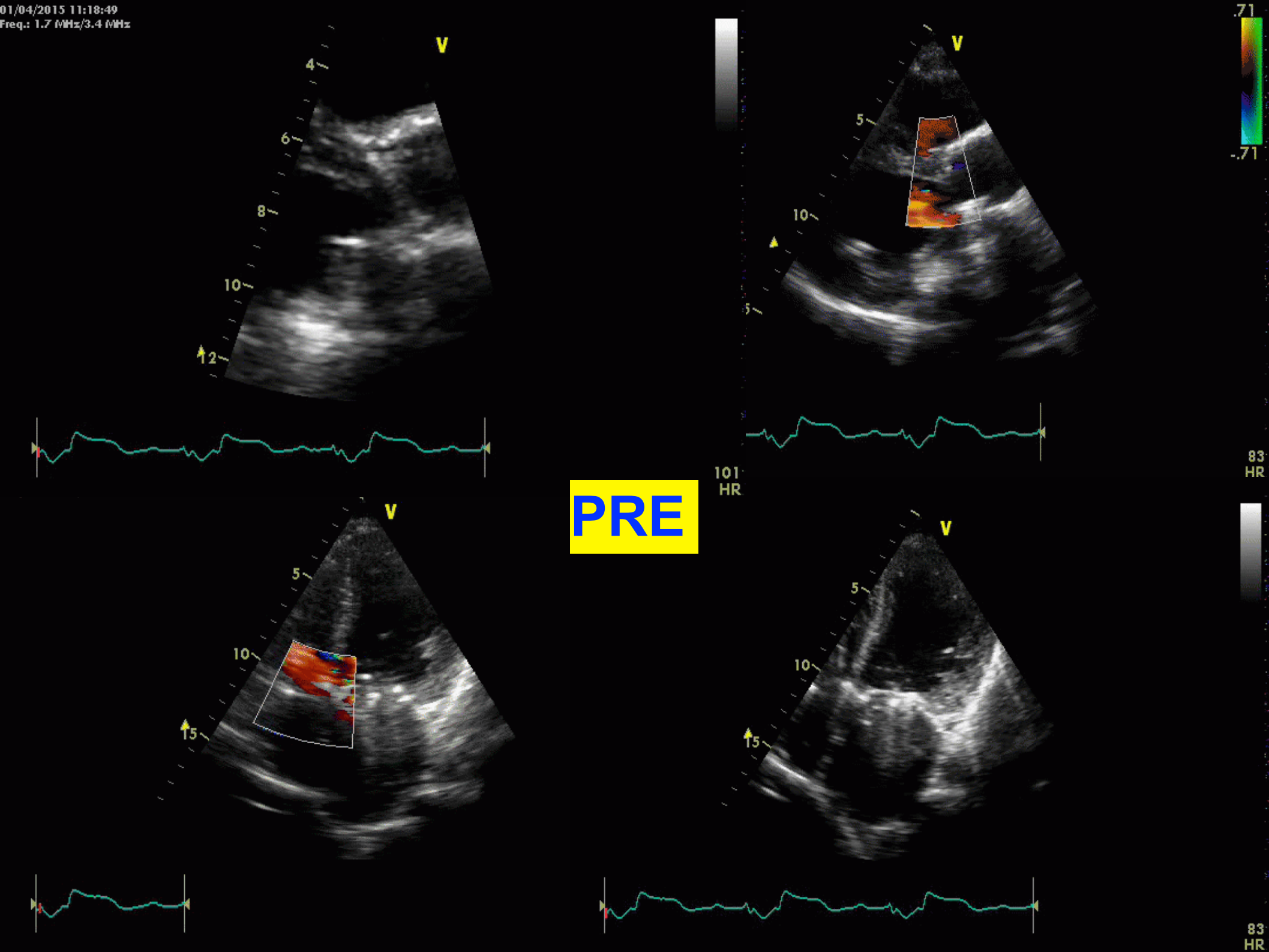
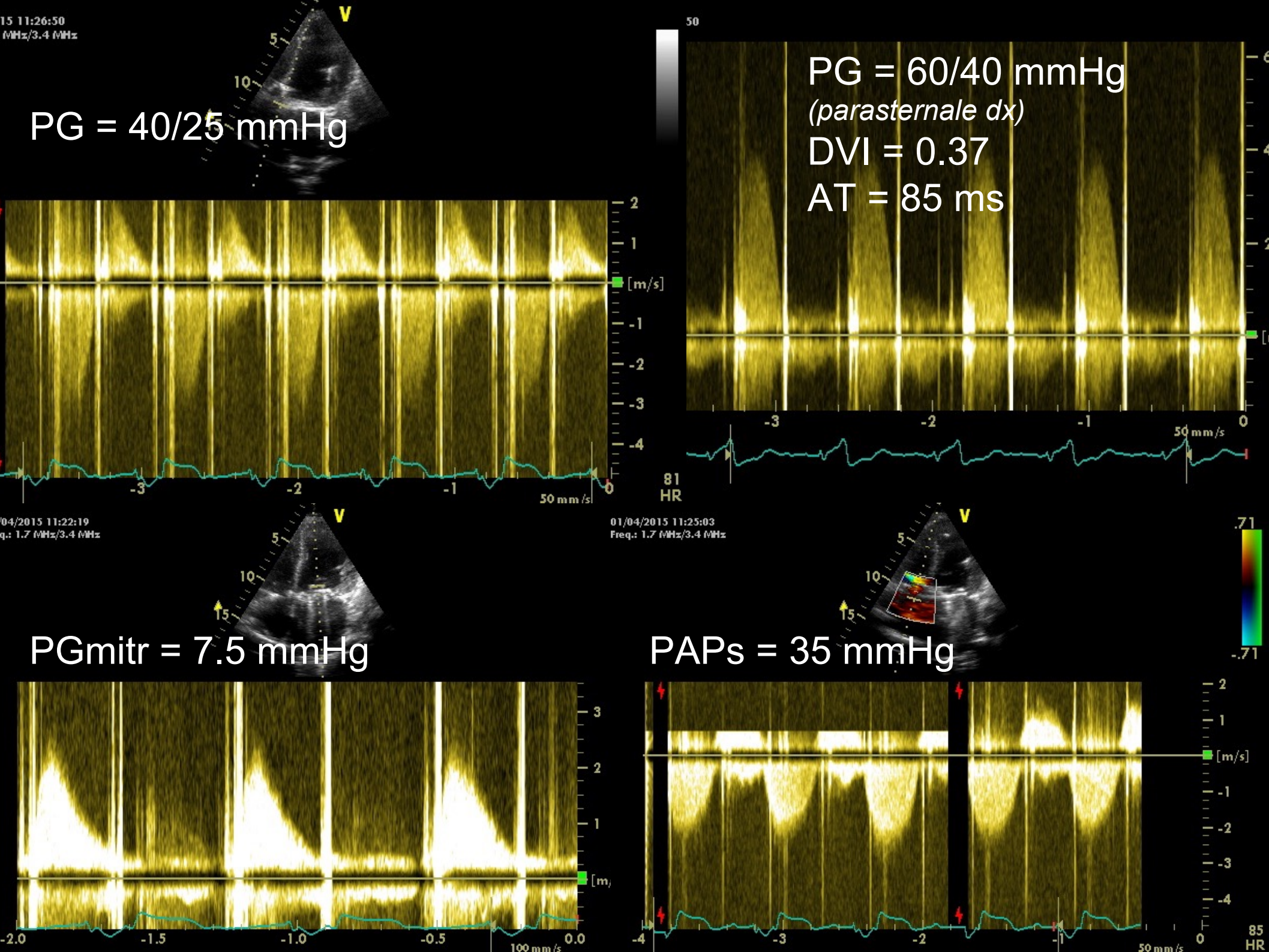
CASO CLINICO - B.Z.

- 31 aa, nigeriana - BSA 1.72 m^2
- 32° settimana gravidanza
- Malattia reumatica: valvulopatia mitroaortica
- 2006: SVAo (Sorin 21) + SVM (Sorin 31) + plastica tricuspidalica
- 2010: tachicaritmia trattata con ablazione RF (+ flecainide e verapamil)
- 2010: impianto PM VDD (BAV post ablazione)
- Nella valutazione pre-partum (2° trimestre) riscontro di aumentato gradiente transprotesico aortico: PG 60/35 mmHg → Sospetto malfunzionamento x panno trombotico
- Fluoroscopia: regolare apertura degli emidischi


01/04/2015 11:18:49
Freq.: 1.7 MHz/3.4 MHz
V
4
6
8
10
12
V
5
10
.71
-.71
101
HR
83
HR
PRE
V
5
10
15
V
5
10
15
83
HR

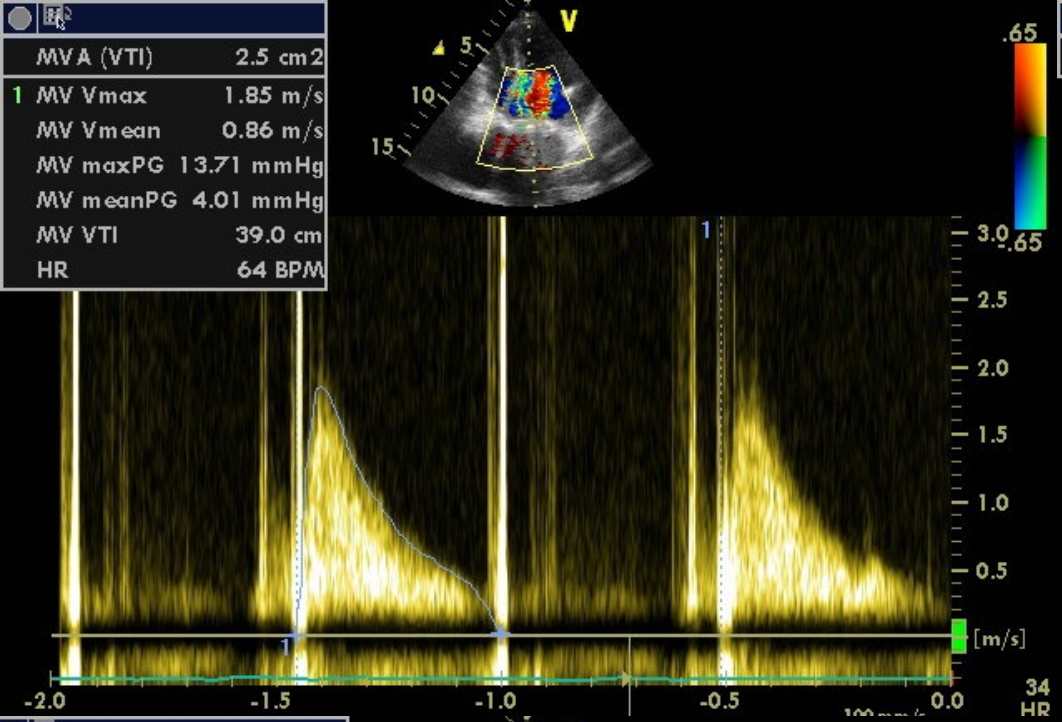

PG = 40/25 mmHg
PG = 60/40 mmHg
(parasternale dx)
DVI = 0.37
AT = 85 ms
PGmitr = 7.5 mmHg
PAPs = 35 mmHg
[m/s]
50 mm/s
100 mm/s
81
HR
85
HR

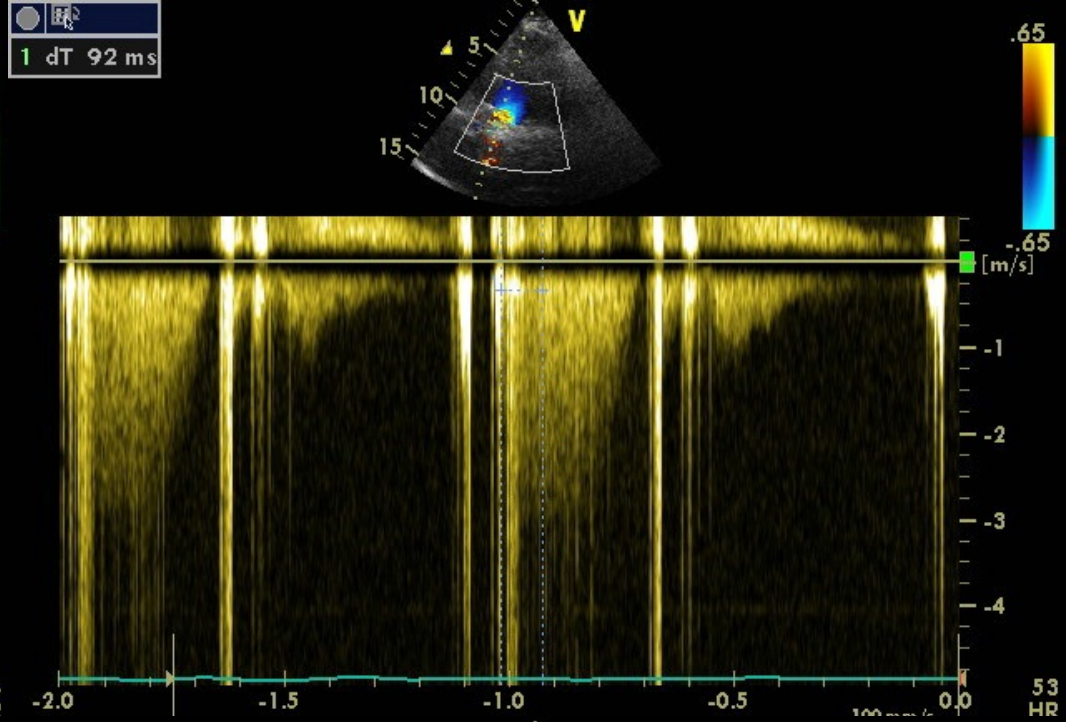
CASO CLINICO - B.Z.

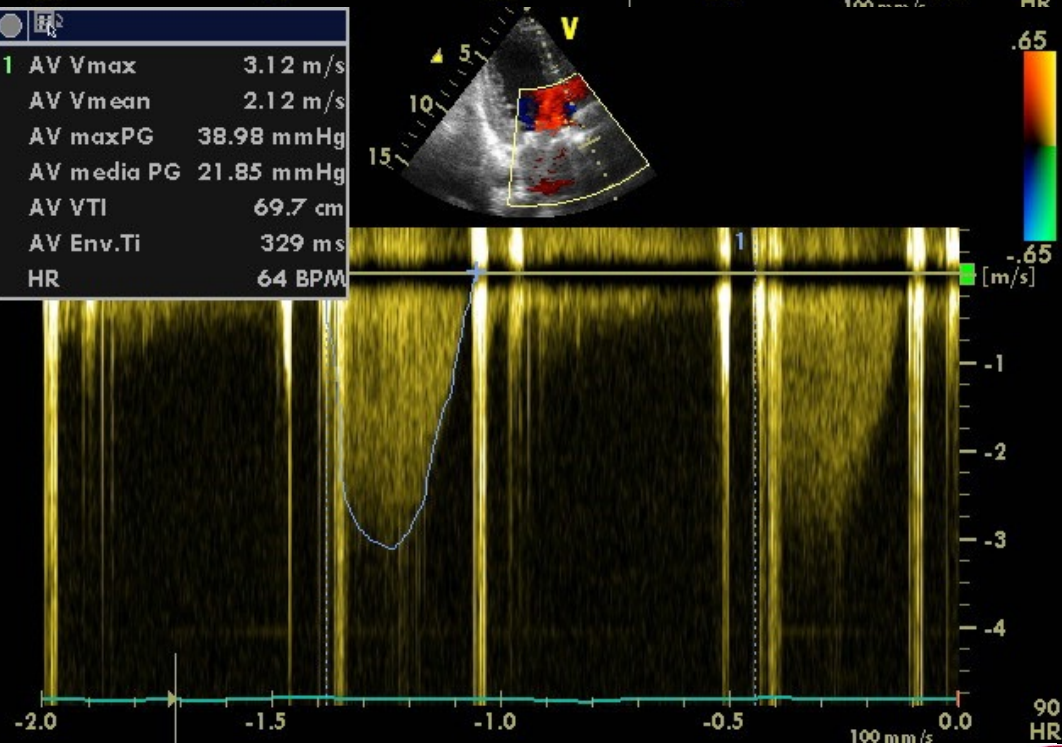
- Parto programmato alla 33° settimana
- Terapia anticoagulante: obiettivo INR = 3, ma TTR basso (ultimo controllo INR = 2.1)
- Parto cesareo in warfarin vs eparina frazionata?
- Ultima settimana: sospensione warfarin e passaggio ad eparina non frazionata (PTT > 70'')
- Parto cesareo con monitoraggio TEE + stand-by cch (ECMO) / cardioanestesista / perfusionista

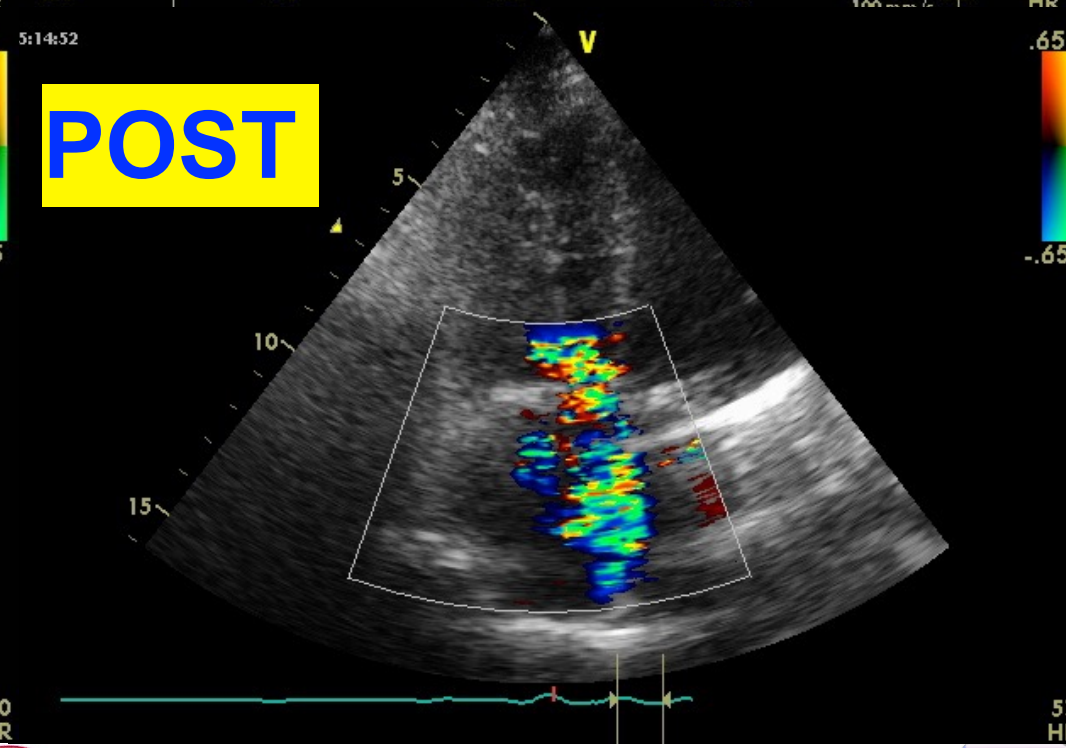
➢ Parto regolare

- Neonata in incubatrice (1.9 kg)
- Non complicanze materne
- Controlli echo settimanali









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SIEC

GRAVIDANZE e VALVULOPATIE: PROBLEMATICHE

-Diverse condizioni emodinamiche

-Valvulopatie native

-Protesi valvolari

-Terapia di supporto

-Terapia anticoagulante

CONSIDERAZIONI GENERALI

- Le valvulopatie (acquisite o congenite) sono un'importante causa di mortalità e morbidità materno-fetale, fino al post-partum (6-12 settimane)
- **European Registry on Pregnancy** (1321 Pts): Valvulopatia presente nel **25%** delle donne cardiopatiche
- Differenze tra paesi ad alto e basso reddito
- Valvulopatie **congenite** nei Paesi industrializzati
- **Malattia reumatica** prevalente nei paesi a basso reddito, ma problema dell'immigrazione

CONSIDERAZIONI GENERALI

- Il **management** della donna valvulopatica dovrebbe iniziare **prima** del concepimento
- Anamnesi personale e famigliare, esame obbiettivo, screening connettivopatie, ECG, ECHO, ev. exercise test
- **Counselling** cardiologo / ginecologo-ostetrico
- Valutare la probabilità di tollerare il **carico emodinamico** della gravidanza e il **rischio** di complicanze
- Score di **classificazione rischio**: CARPREG, WHO, ZAHARA
- Inviare le Pts ad alto rischio in **centri specializzati**

Box 2 Cardiac findings in a normal pregnancy

- Normal history
  - Fatigue
  - Decreased exercise tolerance
  - Palpitations
  - Lower extremity oedema
  - Orthopnoea
- Normal examination
  - Midsystolic murmur at left base (pulmonic flow murmur)
  - Continuous murmur (mammary souffle)
  - Split S1
  - Distended neck veins with prominent a and v waves
  - Lower extremity oedema

Risk assessment

- Preconceptual
  - History of cardiac symptoms including arrhythmias
  - Baseline exercise tolerance and functional class (exercise testing, if needed)
  - Baseline echocardiogram
  - Anatomy and haemodynamics of valve lesion
  - Ventricular function and pulmonary pressures
  - Stability of cardiac haemodynamics over time

- During pregnancy
  - Careful frequent history and physical examination at least once per trimester
  - More frequent monitoring if new symptoms develop
  - Changes in functional class
  - Serial echocardiography for any changes in symptoms or signs

CARPREG RISK SCORE

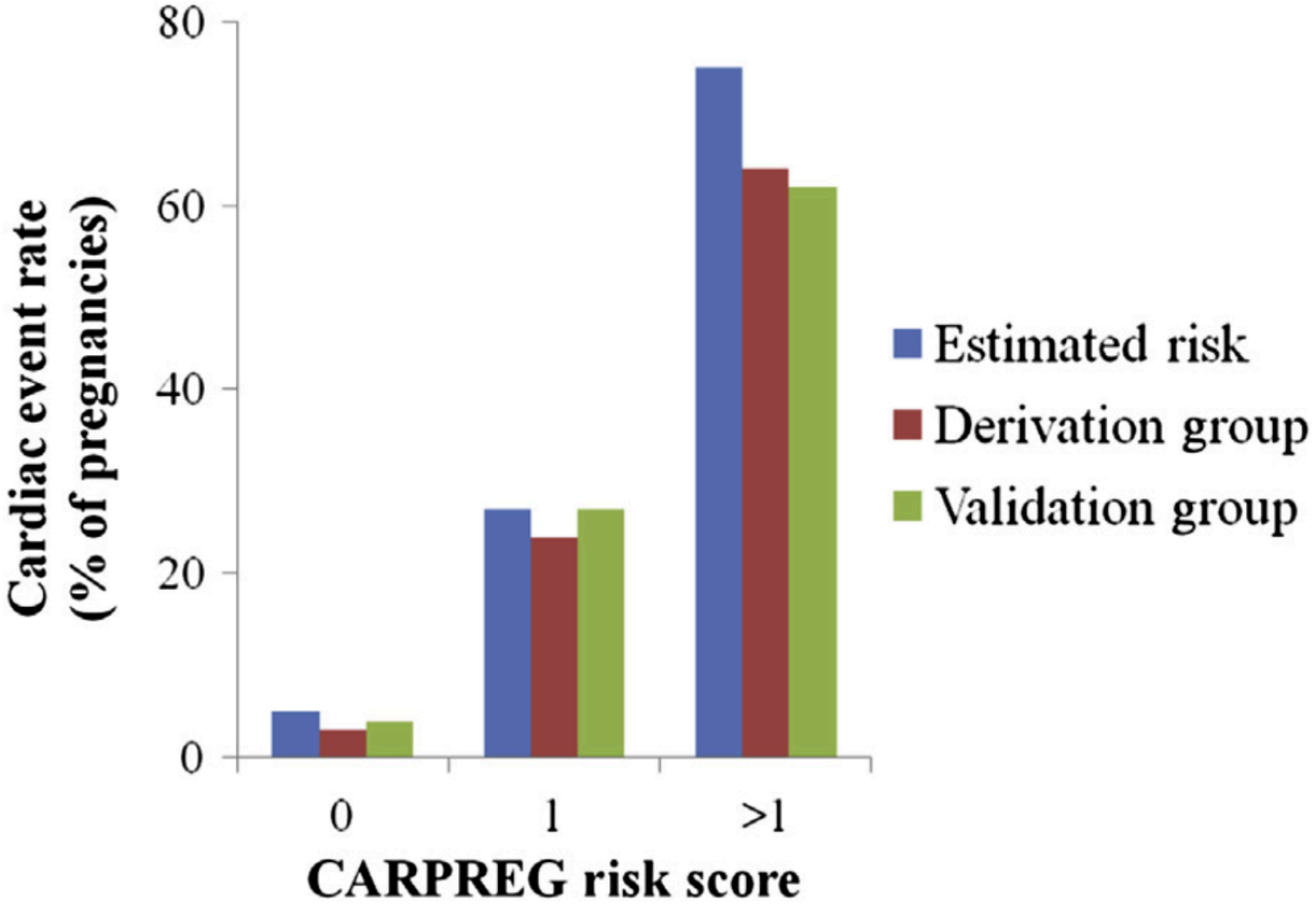
CARdiac disease in PREGnancy

1 punto assegnato a:

- **Anamnesi di scompenso o aritmia**
- **NYHA > II e/o cianosi**
- **Ostruzione nel VS (area mitralica < 2 cm^2, area aortica < 1.5 cm^2, PG_{LVOT} > 30 mmHg)**
- **EF < 40%**

599 Pts

CARPREG RISK SCORE

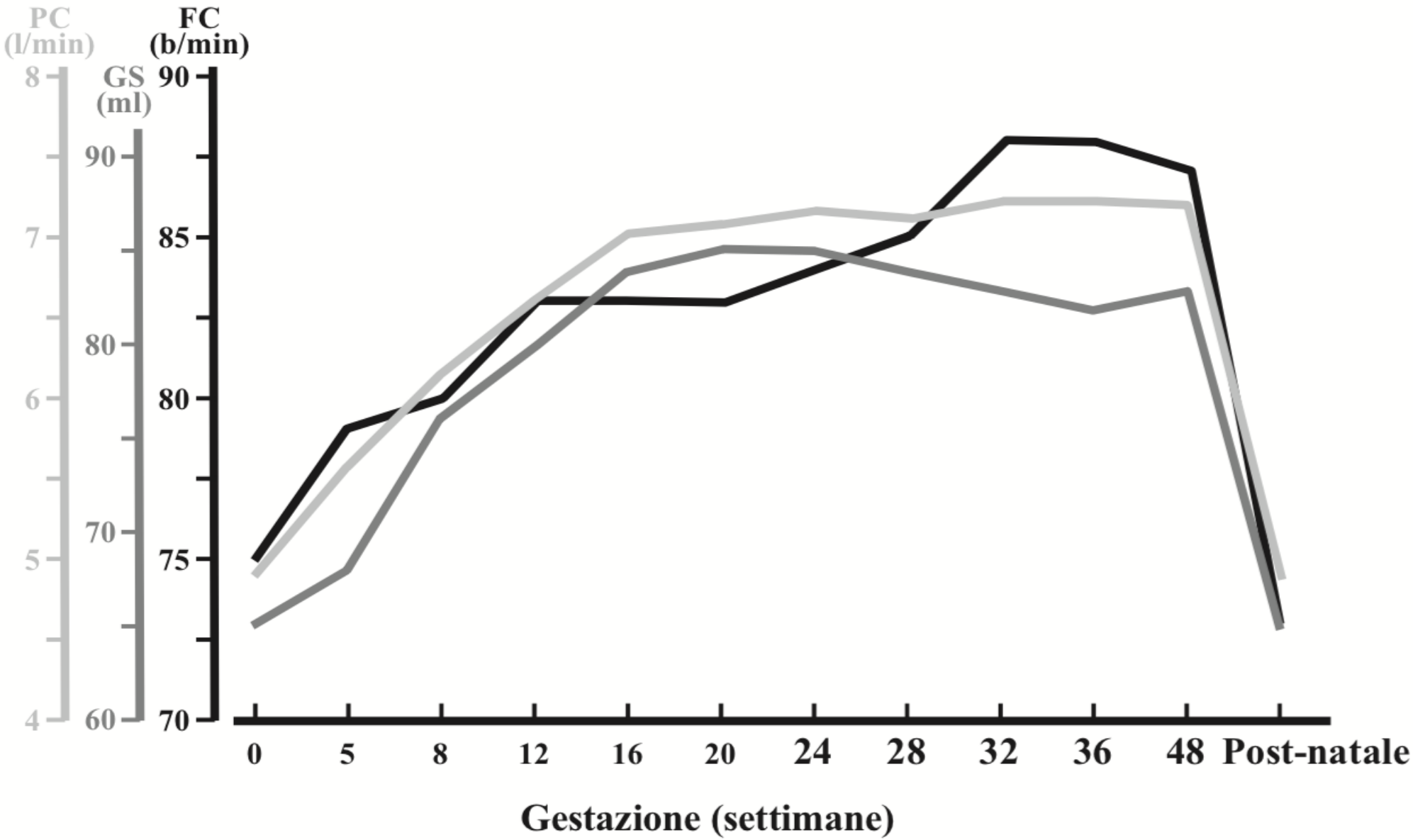


ZAHARA RISK SCORE

- Prior arrhythmias
- NYHA functional class > II
- Left heart obstruction
- Cardiac medication before pregnancy
- Systemic AV valve regurgitation
- Pulmonary AV valve regurgitation
- Mechanical valve prosthesis
- Cyanotic heart disease

1302 PTS VALVULOPATIE CONGENITE

ALTERAZIONI EMODINAMICHE



Normalizzazione a 6 – 12 sett post-partum

ALTERAZIONI EMODINAMICHE

- I **cambiamenti fisiologici** possono comportare complicanze materno-fetali nelle Pts con valvulopatie
- Avvengono dalla 6^ sett fino alla fine del 2° trimestre
- Aumento portata = 30-50%
- Aumento FC e stroke volume
- Caduta delle resistenze vascolari periferiche *(bassa resistenza utero-placentare e vasodilatazione sistemica)*
- Riduzione PAO di 10 mmHg (max fine 2° trimestre)
- Travaglio e parto: ulteriore aumento C.O., FC e PAO *(ansia e tono simpatico)*, con ↑ pre-load *(rilascio v. cava inferiore)*

ECHO: CONCETTI FONDAMENTALI

- Valutazione ecocardiografica con lo stesso approccio e le stesse metodiche utilizzate normalmente
- Le **stenosi valvolari** comportano un rischio più alto rispetto ai rigurgiti:
  - Aumento portata → aumento gradiente
  - Caduta R perif. → ritenzione fluidi ed espansione vol
  - Aumento FC → ridotto riempimento diastolico
- → Dispnea, aritmie, scompenso
- N.B.: attenzione alla sovrastima dei gradienti (“high flow”)
- ↑ FC = ↑ PG picco e medio (ma non effetto su eq. cont.)

Treatment

- Preconceptual
  - Effective contraception until pregnancy is desired
  - Consider valve repair or replacement if symptoms exist before conception
  - Adjust drugs as needed to prevent adverse fetal effects
- During pregnancy
  - Change to only necessary drugs that are not contraindicated in pregnancy
  - Control symptoms with medical treatment, bedrest and oxygen
  - Valvuloplasty, if necessary and appropriate
  - Valve repair or replacement for uncontrolled class III or IV symptoms

- Labour and delivery
  - Short vaginal delivery with excellent anaesthesia
  - Left lateral decubitus position
  - Caesarean section per obstetric indications
  - Invasive monitoring if needed
  - Medical treatment to optimise loading conditions and to treat pulmonary oedema

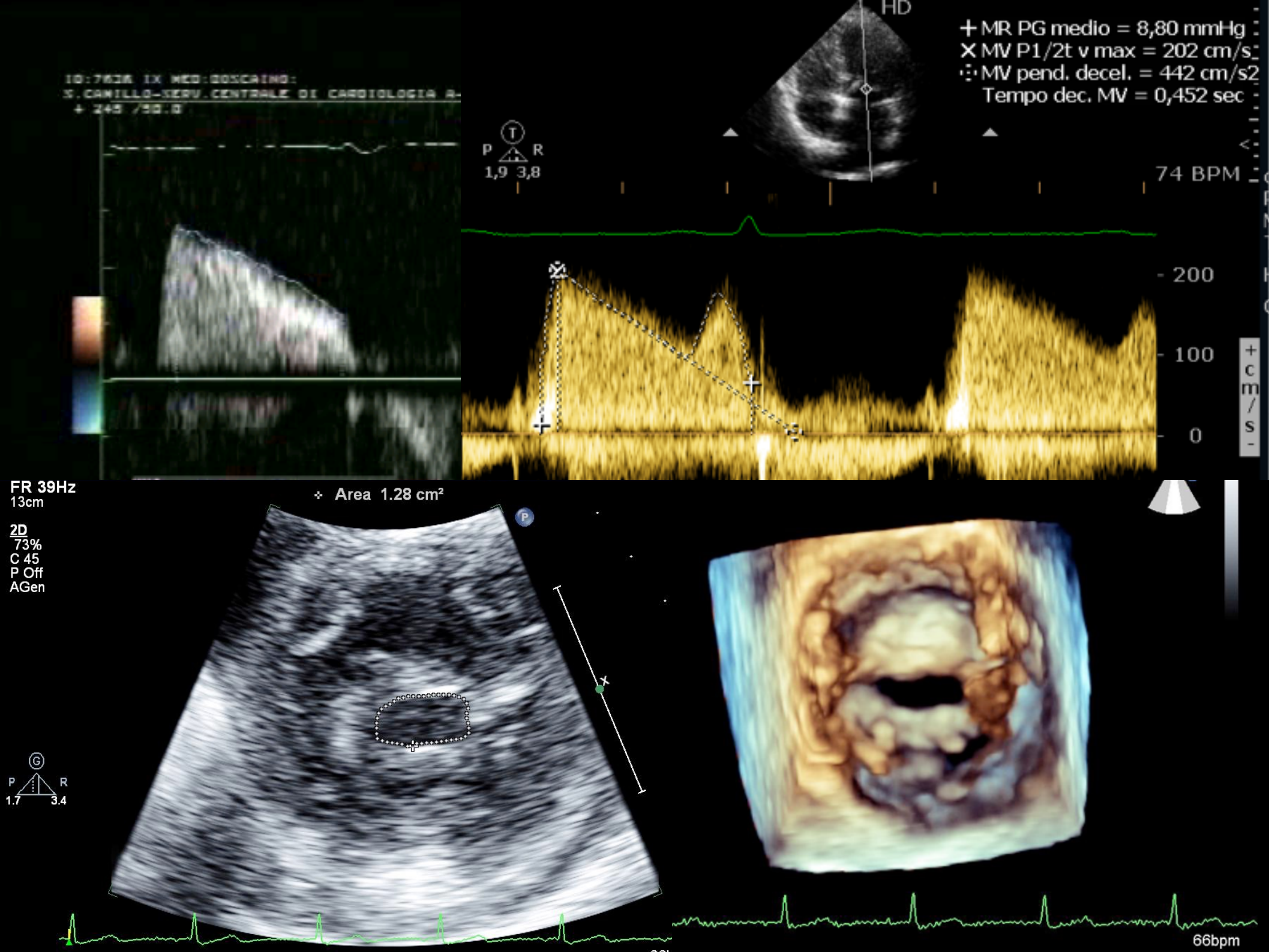
- Post partum
  - Treat anaemia
  - Medical treatment to optimise loading conditions and to treat pulmonary oedema
  - Valve repair or replacement, if indicated
  - Counselling and contraception

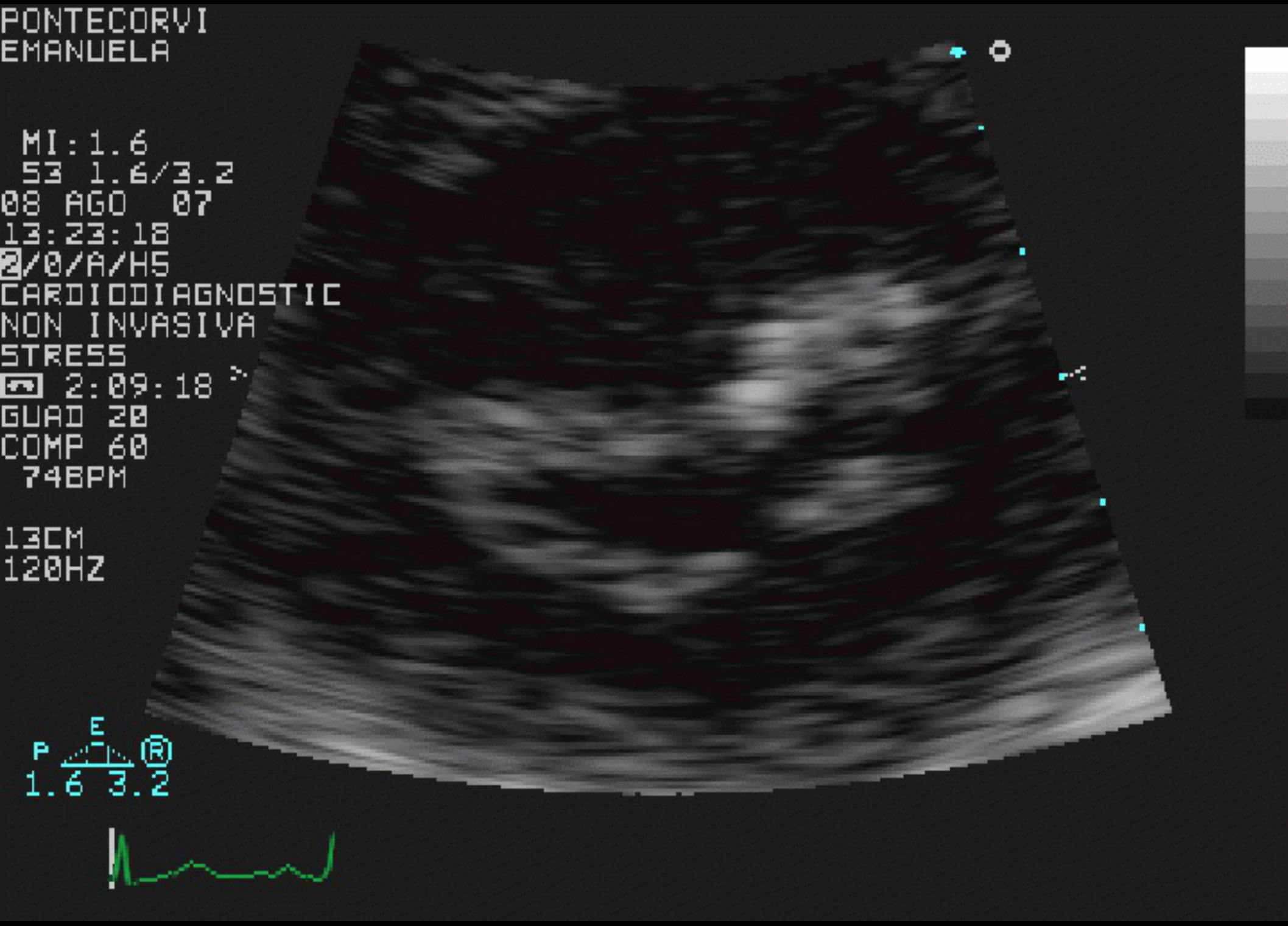
STENOSI MITRALICA - 1

- **Più comune** valvulopatia in gravidanza
- Generalmente di origine **reumatica**
- ↑ PG e ↑ pressione AS → dispnea, rischio EPA e FA
- Morbidità più elevata se area **< 1.5 cm^2**
- **Incidenza di complicanze:**
  - 67% in SM severa
  - 38% in SM moderata
  - 26% in SM lieve
- Mortalità materna comunque bassa
- Rischio di **stroke** (ipercoagulabilità): TAO se SM severa + atriomegalia (anche se in RS)?

STENOSI MITRALICA - 2

- **Outcome fetale**:
  - parto pretermine: 26% mod, 44% sev vs 9% controlli
  - ritardo crescita: 27% mod, 33% sev vs 0% controlli
  - peso ridotto: 2.7 kg mod, 2.55 kg sev vs 3.4 controlli
- SM lieve = outcome favorevole
- **Valvuloplastica** echo-guidata se **< 1 cm^2**:
  - pre-concepimento
  - in gravidanza (NYHA III-IV): fine 2° - inizio 3° trimestre
  - mortalità se CCH: 9% materna, 35% fetale/neonatale
- Utilità beta-bloccanti (metoprololo), diuretici, digox
- Continuare monitoraggio echo per 24h post-partum


ID:7636 IX MED:BOSCAINO:
S.CAMILLO-SERV.CENTRALE DI CARDIOLOGIA A-
+ 249 /50.0
HD
+ MR PG medio = 8,80 mmHg
× MV P1/2t v max = 202 cm/s
MV pend. decel. = 442 cm/s2
Tempo dec. MV = 0,452 sec
P R
1,9 3,8
74 BPM
200
100
0
cm/s
FR 39Hz
13cm
2D
73%
C 45
P Off
AGen
Area 1.28 cm²
P R
1.7 3.4
66bpm

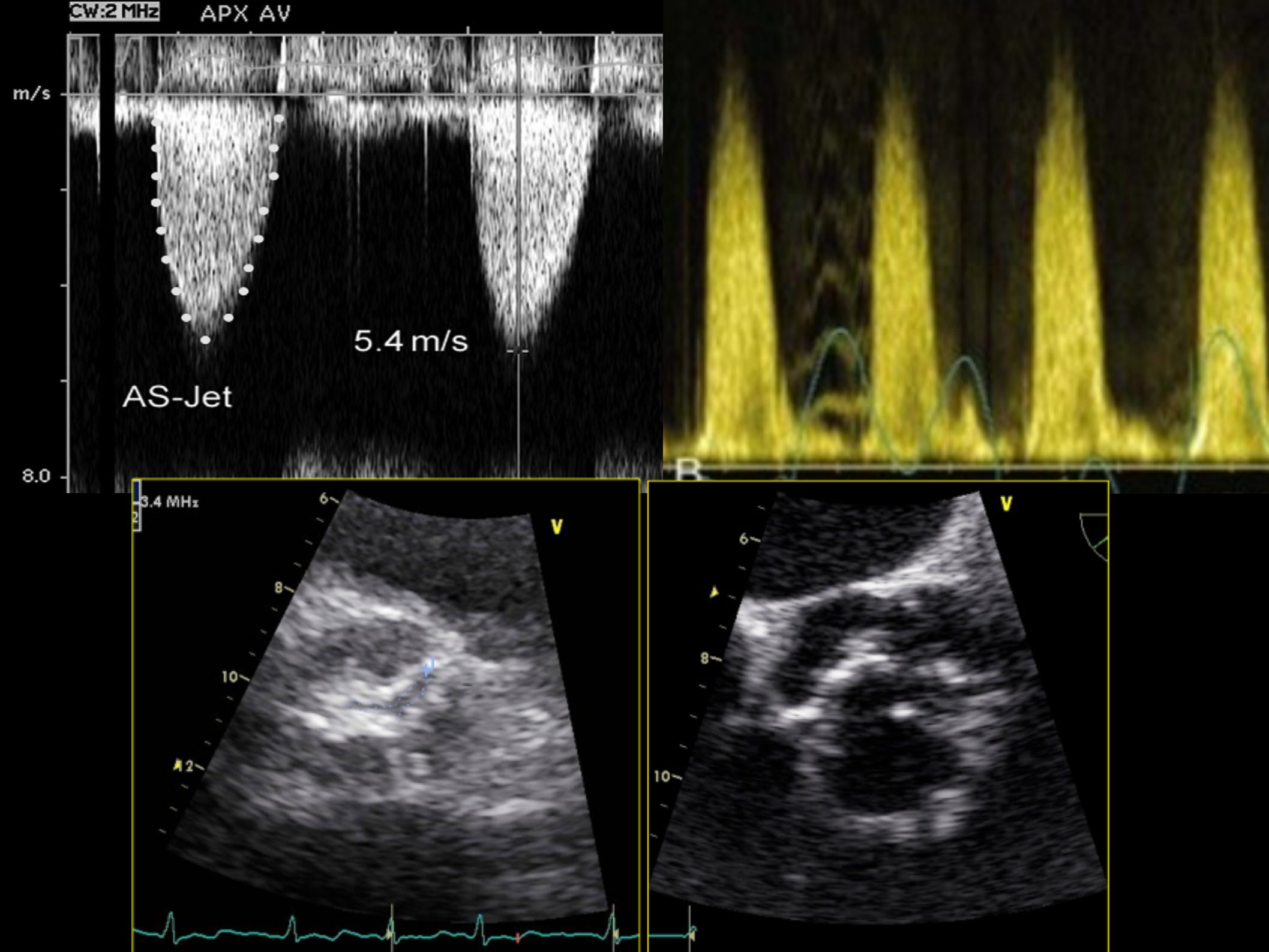

PONTECORVI
EMANUELA
MI:1.6
53 1.6/3.2
08 AGO 07
13:23:18
2/0/A/H5
CARDIODIAGNOSTIC
NON INVASIVA
STRESS
2:09:18
GUAD 20
COMP 60
74BPM
13CM
120HZ
E
P
R
1.6 3.2

PUNTEGGIO di WILKINS

- Predittivo dell'esito della valvuloplastica con palloncino (fattibile se < 8)
- Si ricava dall'analisi di 4 parametri:
  - Mobilità dei lembi
  - Spessore apparato sottovalvolare
  - Spessore dei lembi
  - Calcificazioni
- Poco utile per il CCH (meglio la descrizione!)

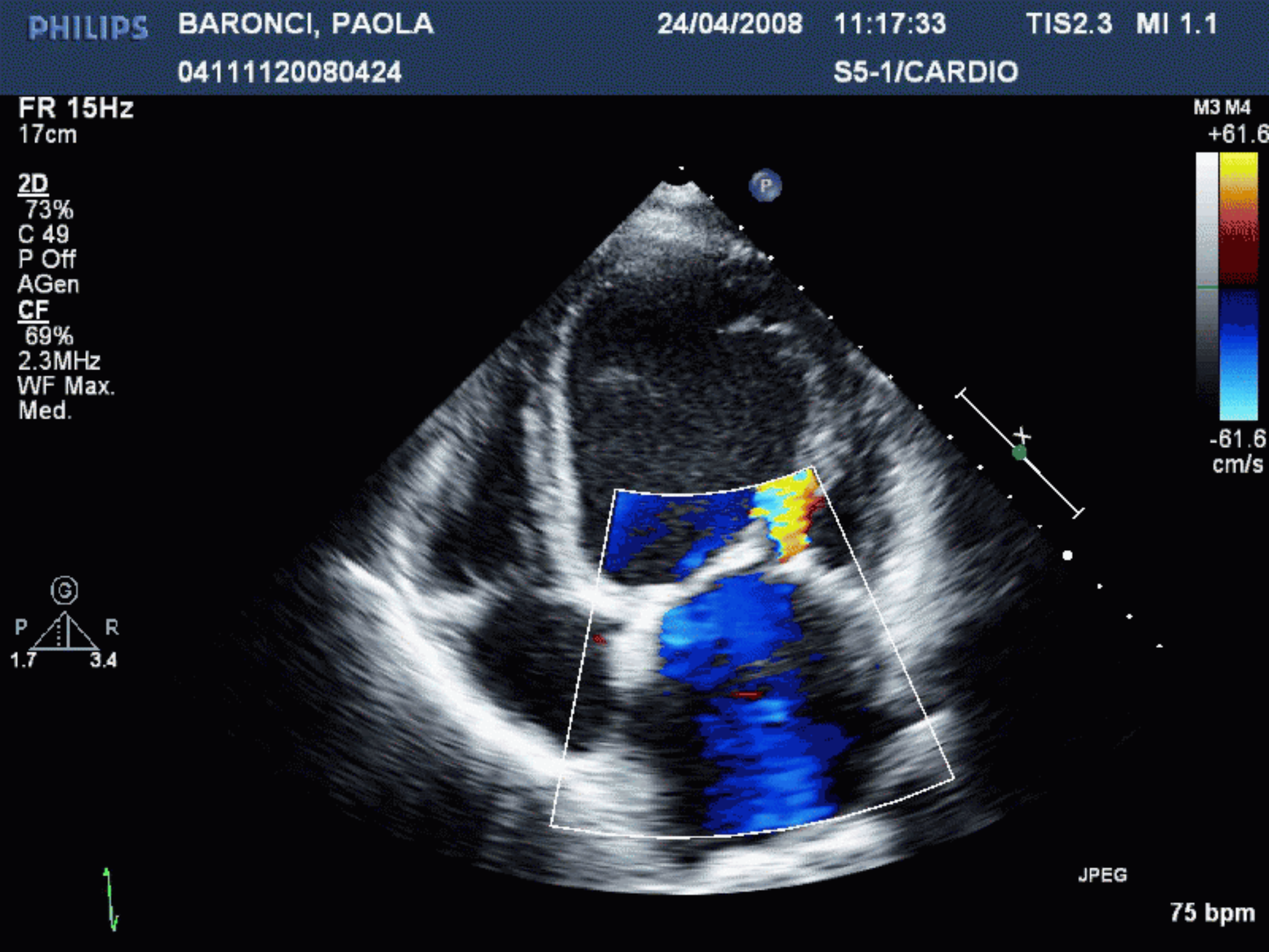
STENOSI AORTICA

- Etiologia **congenita** (bicuspidia spt), più rara reumatica
- SAo lieve e moderata = outcome favorevole
- SAo severa (**ava < 1 cm², vel > 4 m/s**) = importante morbidità, ma mortalità rara
- **Outcome fetale con SAo severa**:
  - parto pretermine: 44% vs 9% controlli
  - ritardo crescita: 22% vs 0% controlli
  - peso ridotto: 2.6 kg vs 3.4 controlli
- Se **sintomatologia** importante con SAo severa → **valvuloplastica** (o cch) con **alto rischio fetale**


CW:2 MHz
APX AV
m/s
8.0
5.4 m/s
AS-Jet
3.4 MHz
V
V

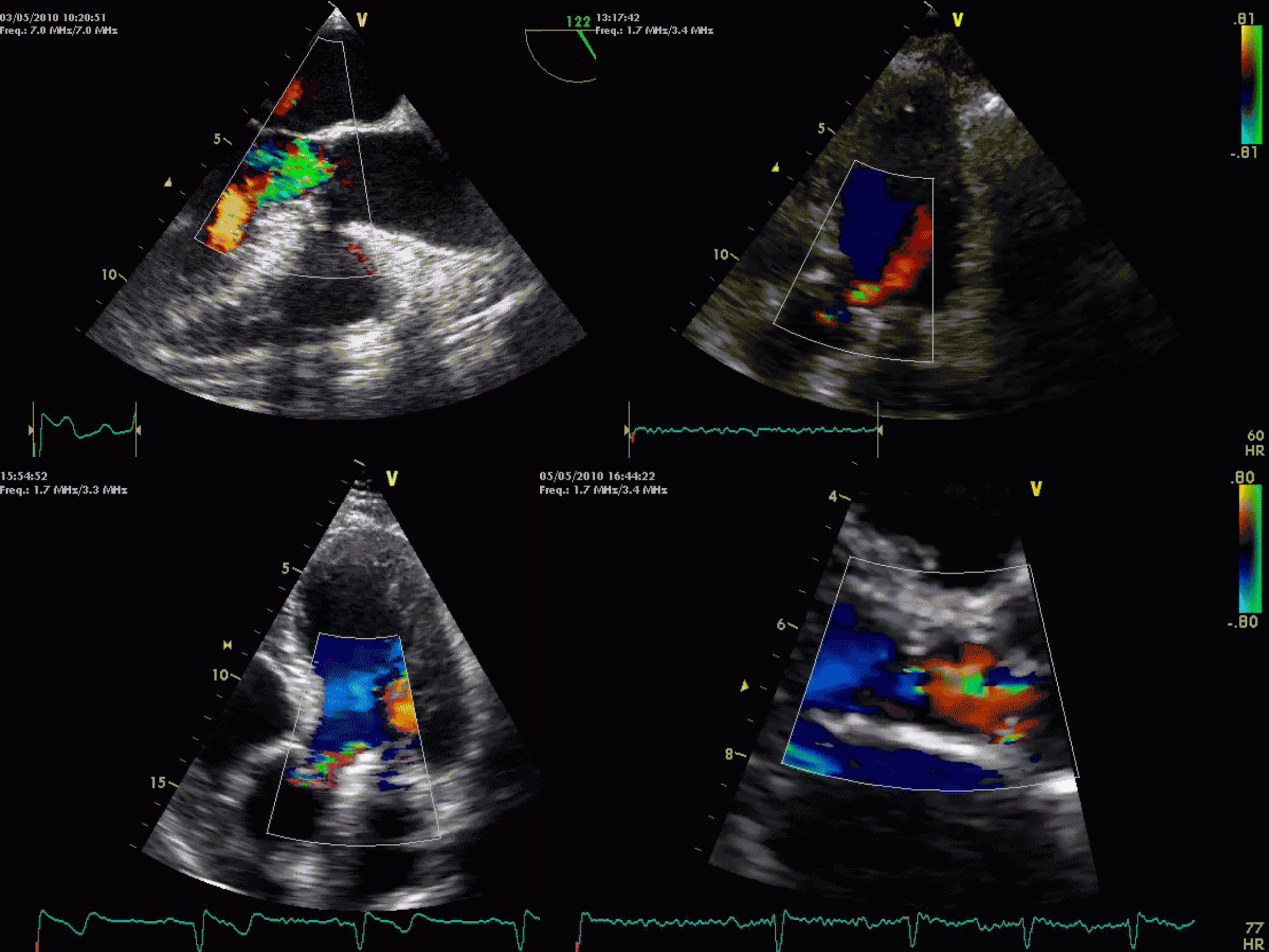
INSUFFICIENZA MITRALICA

- **RAA** o **prolasso** le cause più comuni
- In genere **ben tollerata**
- Cch profilattica non indicata
- Pts asintomatiche non richiedono terapie
- Valvuloplastica o SVM solo se sintomi non controllati (alta mortalità fetale)
- Diuretici e digox


PHILIPS
BARONCI, PAOLA
24/04/2008 11:17:33
TIS2.3 MI 1.1
04111120080424
S5-1/CARDIO
FR 15Hz
17cm
2D
73%
C 49
P Off
AGen
CF
69%
2.3MHz
WF Max.
Med.
M3 M4
+61.6
-61.6
cm/s
P
R
1.7
3.4
JPEG
75 bpm

INSUFFICIENZA AORTICA

- **Bicuspidia**, RAA, dilatazione annulus o endocardite
- In genere **ben tollerata**
- Cch profilattica non indicata
- Pts asintomatiche non richiedono terapie
- Se severa IAo con sintomi: diuretici e digox – eventualmente idralazina e nitrati

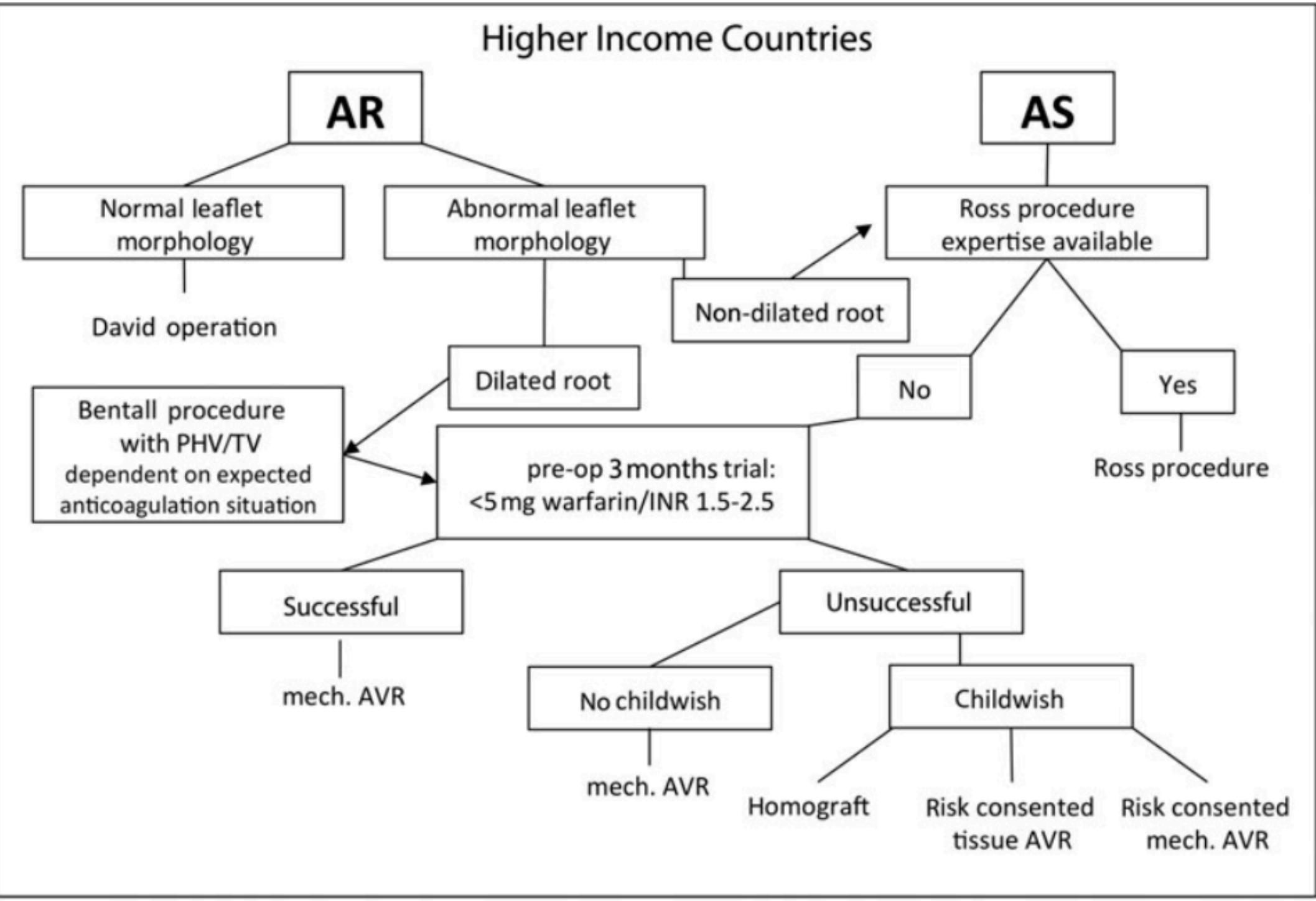

03/05/2010 10:20:51
Freq.: 7.0 MHz/7.0 MHz
122 13:17:42
Freq.: 1.7 MHz/3.4 MHz
.81
-.81
60
HR
15:54:52
Freq.: 1.7 MHz/3.3 MHz
05/05/2010 16:44:22
Freq.: 1.7 MHz/3.4 MHz
.80
-.80
77
HR

STENOSI POLMONARE

- **Congenita**: valvolare o, più raramente, sopra-/sotto-valv.
- Deterioramento in homograft nell'intervento di Ross
- **Ben tollerata**, anche se severa
- Non differenze tra durata gravidanza e peso alla nascita vs controlli
- Valvuloplastica al di fuori della gravidanza in caso di sintomi e PG > 50 mmHg a riposo in RVOT

ENDOCARDITE INFETTIVA

- Evento **raro**
- Potenzialmente ad **alta mortalità**: 22% materna, 15% fetale
- **NON** raccomandata la **profilassi antibiotica** al momento del parto
- ABT controindicati in gravidanza: aminoglicosidi, chinolonici e tetracicline


Higher Income Countries
AR
AS
Normal leaflet morphology
Abnormal leaflet morphology
Ross procedure expertise available
David operation
Non-dilated root
Dilated root
No
Yes
Bentall procedure with PHV/TV dependent on expected anticoagulation situation
pre-op 3 months trial: <5 mg warfarin/INR 1.5-2.5
Ross procedure
Successful
Unsuccessful
mech. AVR
No childwish
Childwish
mech. AVR
Homograft
Risk consented tissue AVR
Risk consented mech. AVR

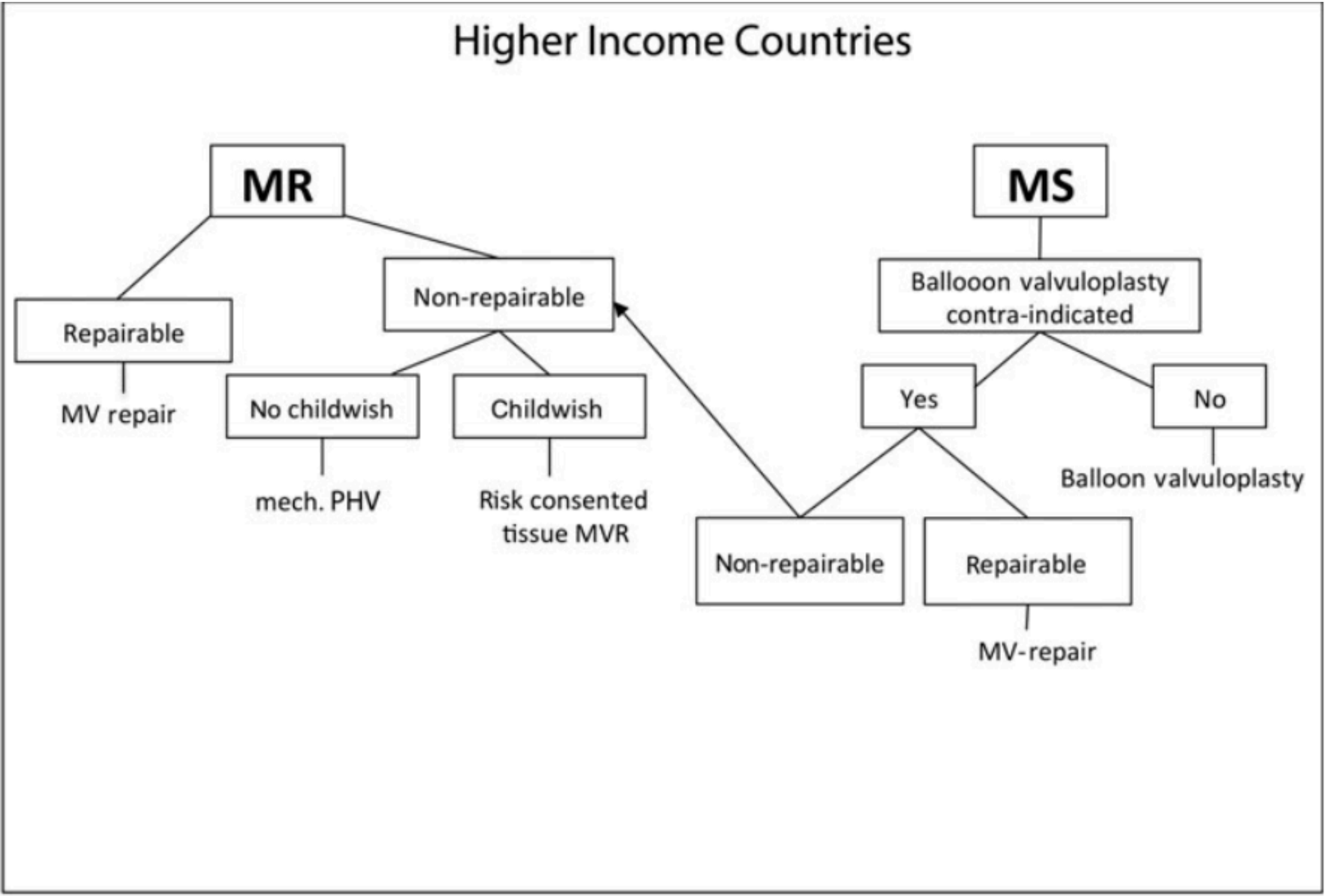

Higher Income Countries
MR
Repairable
MV repair
Non-repairable
No childwish
mech. PHV
Childwish
Risk consented tissue MVR
MS
Balloon valvuloplasty contra-indicated
Yes
No
Balloon valvuloplasty
Non-repairable
Repairable
MV-repair

Table 2 Risk stratification according to type of valvular lesion and severity

Lesion	Aetiology[a]	Risk to mother	Risk to foetus	Possible intervention[b]	Preferred mode of delivery
Mitral stenosis	Rheumatic	Mild MS (area >1.5 cm^2/ asymptomatic: low risk Moderate-to-severe MS (area <1.5 cm^2, in AF): may develop heart failure; mortality up to 3%.	Prematurity 20–30%, intrauterine growth retardation 5–20%, still birth 1–3%. Offspring risk higher in women in NYHA class >II.	Non-pregnant: Moderate–severe MS should be counselled before pregnancy and may need intervention. In pregnancy: beta-blockers and duretics; in AF digoxin Percutaneous mitral commissurotomy in NYHA FC III/IV or PAP >50 mmHg on medical therapy	Vaginal delivery in mild MS; Caesarean in moderate–severe MS in FC III/IV or having pulmonary HT on medical therapy.
Aortic stenosis	Congenital bicuspid	Severe AS-Asymptomatic on exercise test: Low risk Severe AS symptoms or drop in BP on exercise test: heart failure in 10% and arrhythmias in 3–25%.	Foetal complications increased in moderate and severe AS as pre-term birth, intrauterine growth retardation, low birth weight in up to 25%.	Non-pregnant: symptomatic severe AS or asymptomatic AS with LV dysfunction or aortic dilatation >45 mm should be counselled against pregnancy or have an intervention first. In pregnancy: restrict activities and in AF beta-blocker or a non-dihydropyrine for rate control. Percutaneous valvuloplasty in severely symptomatic patient despite bedrest and medical therapy.	Non-severe AS vaginal delivery, in selected cases of severe AS Caesarean delivery can be considered.
Mitral regurgitation	Rheumatic, congenital	Moderate-to-severe MR with good LV function: low risk with good care Severe MR with LV dysfunction: high risk of heart failure or arrhythmia	No increased risk of foetal complications has been reported	Non-pregnant: patients with severe regurgitation and symptoms or impaired LV function or dilatation should be referred for pre-pregnancy surgery Pregnant: Symptoms of fluid overload can be managed with diuretics. Surgery in women with intractable HF.	Vaginal delivery is preferable. Epidural anaesthesia and shortened second stage is advisable
Aortic regurgitation	Rheumatic, congenital, degenerative	Moderate-to-severe AR with good LV function: low risk with good care Severe AR with LV dysfunction: high risk of heart failure or arrhythmia	No increased risk of foetal complications has been reported	Non-pregnant: patients with severe regurgitation and symptoms or impaired LV function or severe dilatation should be referred for pre-pregnancy surgery Pregnant: Symptoms of fluid overload can be managed with diuretics and bedrest. Surgery in women with intractable HF, preferably after delivery.	Vaginal delivery is preferable. Epidural anaesthesia and shortened second stage is advisable
Tricuspid regurgitation	Functional, Ebstein's anomaly, endocarditis	Moderate-to-severe TR with good RV function: arrythmias Moderate-to-severe TR with impaired RV function: heart failure	No increased risk of foetal complications has been reported	Non-pregnant: patients with severe regurgitation and symptoms or impaired LV and/or RV function or dilatation should be referred for pre-pregnancy TV repair Pregnant: severe TR can usually be managed medically with diuretics	Vaginal delivery is preferable.

MS, mitral stenosis; AF, atrial fibrillation; MR, mitral regurgitation; AR, aortic regurgitation; TR, tricuspid regurgitation; NYHA, New York Heart Association; AS, aortic stenosis; LV, left ventricular; RV, right ventricular ; TV, tricuspid valve PAP, pulmonary arterial pressure ; FC, function class.

[a]Only most common listed.

[b]Possible intervention could be, e.g. medical, balloon valvotomy, or surgical.

CONCLUSIONI

- Tutte le donne in età fertile con valvulopatia dovrebbero ricevere un counselling pre-concepimento
- Management delle Pts ad alto rischio da parte di team multidisciplinare
- Follow-up individualizzati
- Complicanze frequenti nella SM severa
- Se SM sintomatica (nonostante terapia) considerare valvuloplastica
- SAo severa associata a complicanze materno/fetali
- I vizi di rigurgito e le stenosi lievi/moderate sono generalmente ben tollerate
- Parto preferenziale per via vaginale

grazie per l'attenzione !