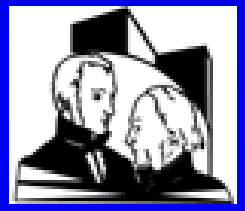
Valvular Heart Disease Management and Pregnancy



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Clinical History

- 37-year old woman
  - ✓ Immigrant from Northern Africa, in France for 2 years
  - ✓ No known heart disease
  - ✓ 2 uneventful pregnancies in 1999 and 2002

- Consultation during the 4th pregnancy (16 weeks) Claims to be asymptomatic
  - ✓ Clinical examination
    - Diastolic murmur 3/6, OS, B1 +
    - No sign of CHF, BP 120/70
    - 65 Kg – 1.62m (BSA: 1.69)
    - Sinus rhythm


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S5-1/CARDIO
CI 39Hz
12cm
2D
46%
C 50
P Bas
HGén
C3
P
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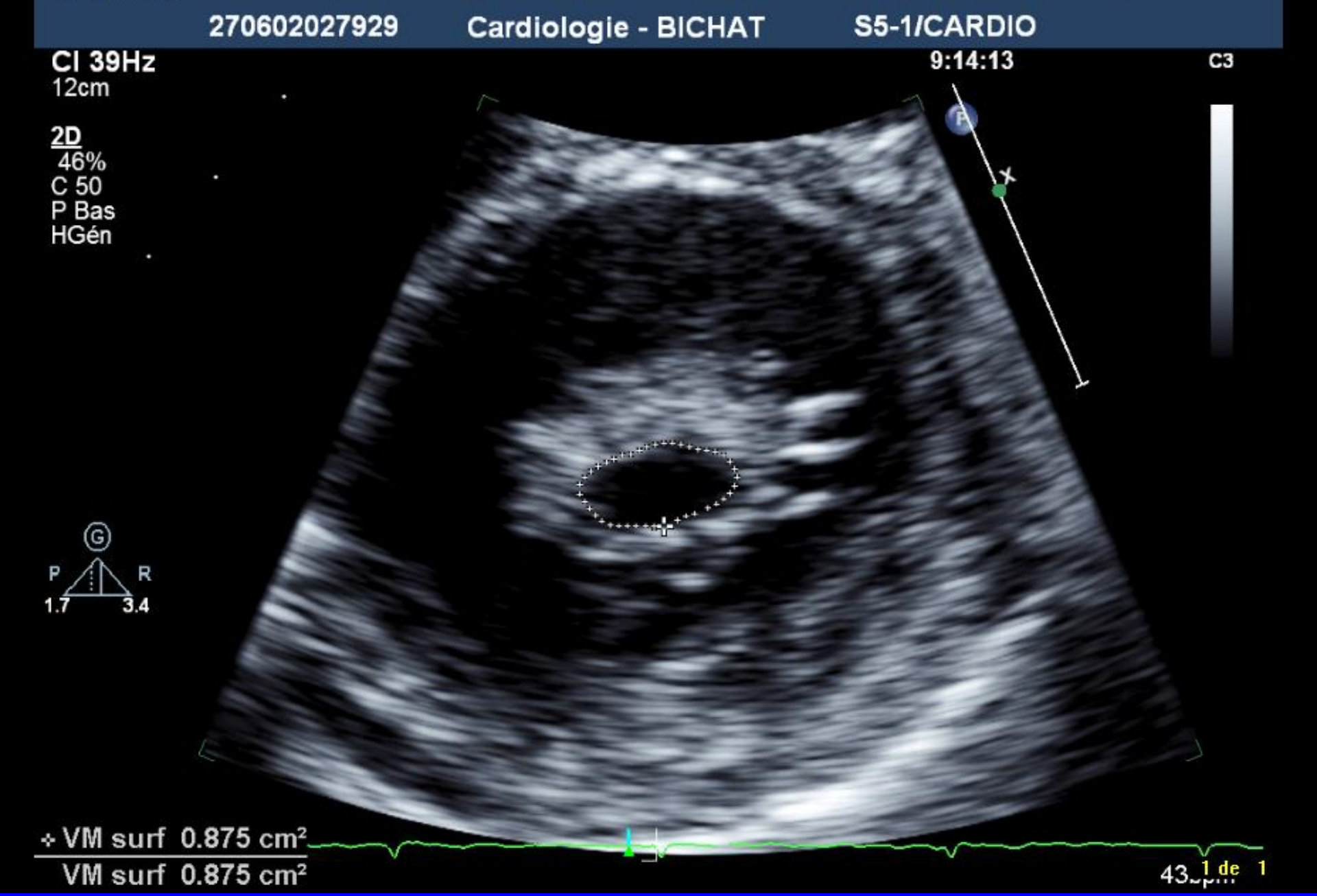
1.7
3.4
JPEG
61 bpm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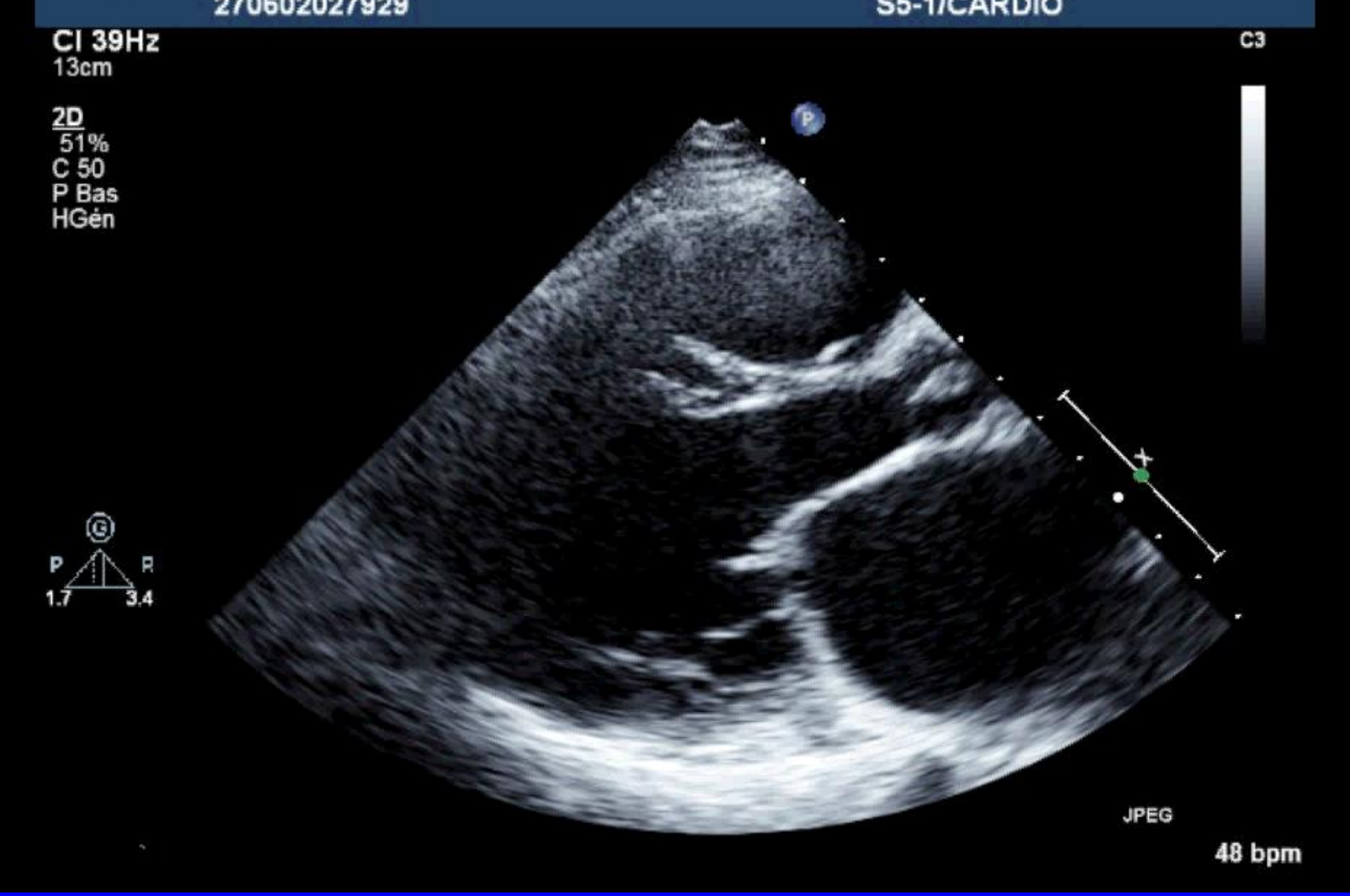
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S5-1/CARDIO
CI 39Hz
13cm
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51%
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3.4
JPEG
48 bpm

Echocardiography

- Valve area: 0.7 cm^2 (planimetry)
- Mean mitral gradient: 8 mmHg
- Cormier Class 1, Echo Score: 7
- MR mild
- Systolic pulmonary pressure: 45 mmHg at rest
- Left atrial area: 28 cm^2

Therapeutic Options

1. Termination of pregnancy
2. Percutaneous mitral commissurotomy
3. Open-heart commissurotomy
4. Beta-blockers and close follow-up
5. No treatment and close follow-up

Choice

Beta-blockers and close follow-up

- Debatable indication for pregnancy termination and patient refusal
- Good tolerance : no indication for an invasive procedure
- Beta-blockers : tight stenosis and moderate pulmonary hypertension

  close follow-up advised

Evolution

- Dyspnea NYHA class III beginning at week 24
- No change in clinical examination
- ECG: sinus rhythm, heart rate 70 / min
- Echocardiography
  - Valve area 0.8 cm^2, mild MR
  - Mean gradient 12 mmHg
  - Systolic pulmonary artery pressure 65 mmHg
- No change after addition of furosemide 40 mg /day
- Normal fetal growth according to echography

Therapeutic Options

1. Percutaneous mitral commissurotomy
2. Open-heart commissurotomy
3. Add diuretics
4. Program early delivery

Choice

Percutaneous mitral commissurotomy

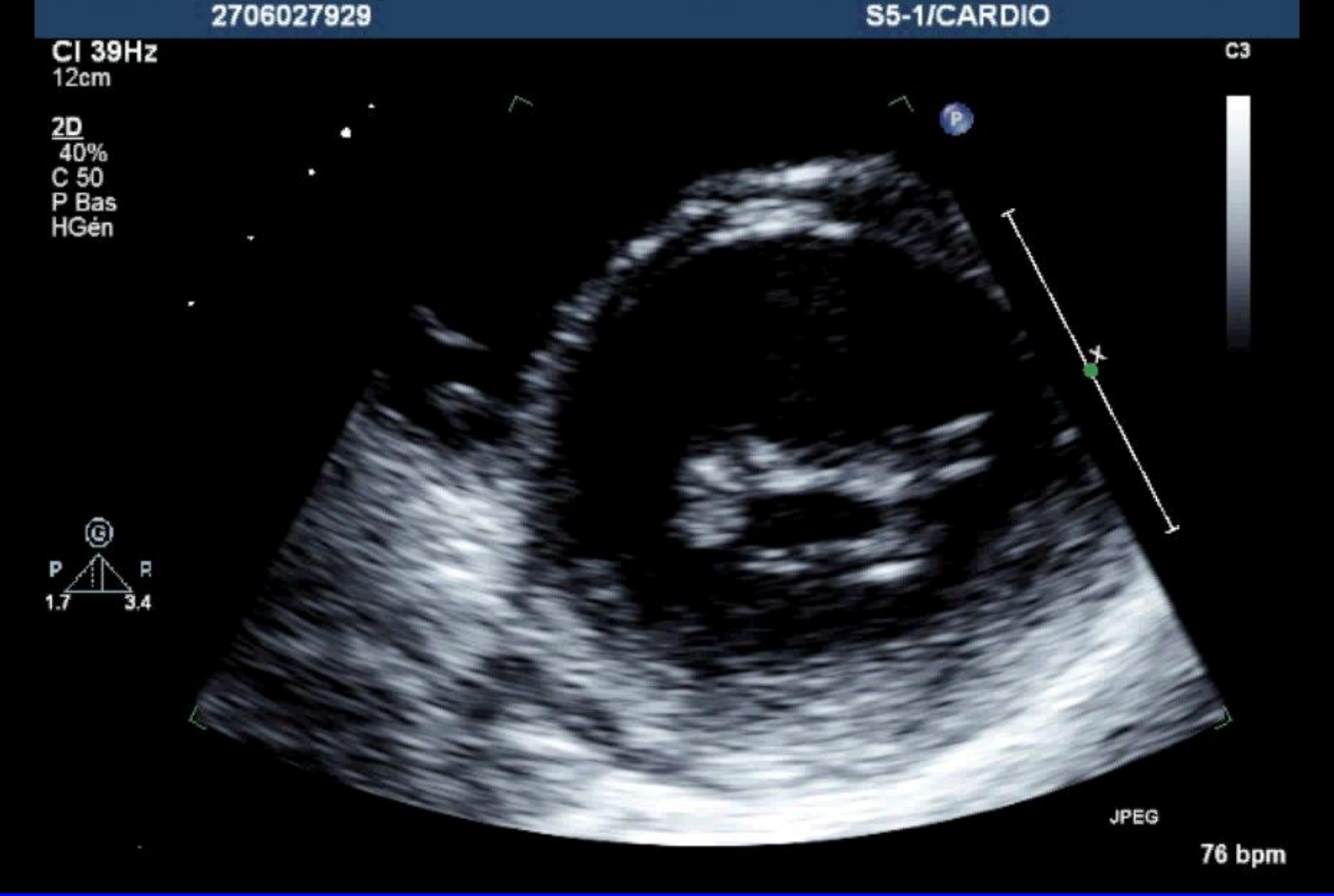
- Severe symptomatic MS despite medical therapy

→ High risk of fetal and maternal complication (3rd trimester, delivery)

- Anatomical conditions suitable for balloon commissurotomy
- Pregnancy term > 20 weeks
- High fetal risk if open-heart surgery

Procedure

- Percutaneous mitral commissurotomy at 26th week
  - Under general anaesthesia with per-procedure TEE (no LA thrombus)
  - Stepwise Inoue technique under echo monitoring
  - Uneventful procedure
- Echocardiographic examination
  - Complete opening of external commissure
  - Valve area 1.6 cm^2
  - Mean gradient 9 mmHg
  - Systolic pulmonary artery pressure 40 mmHg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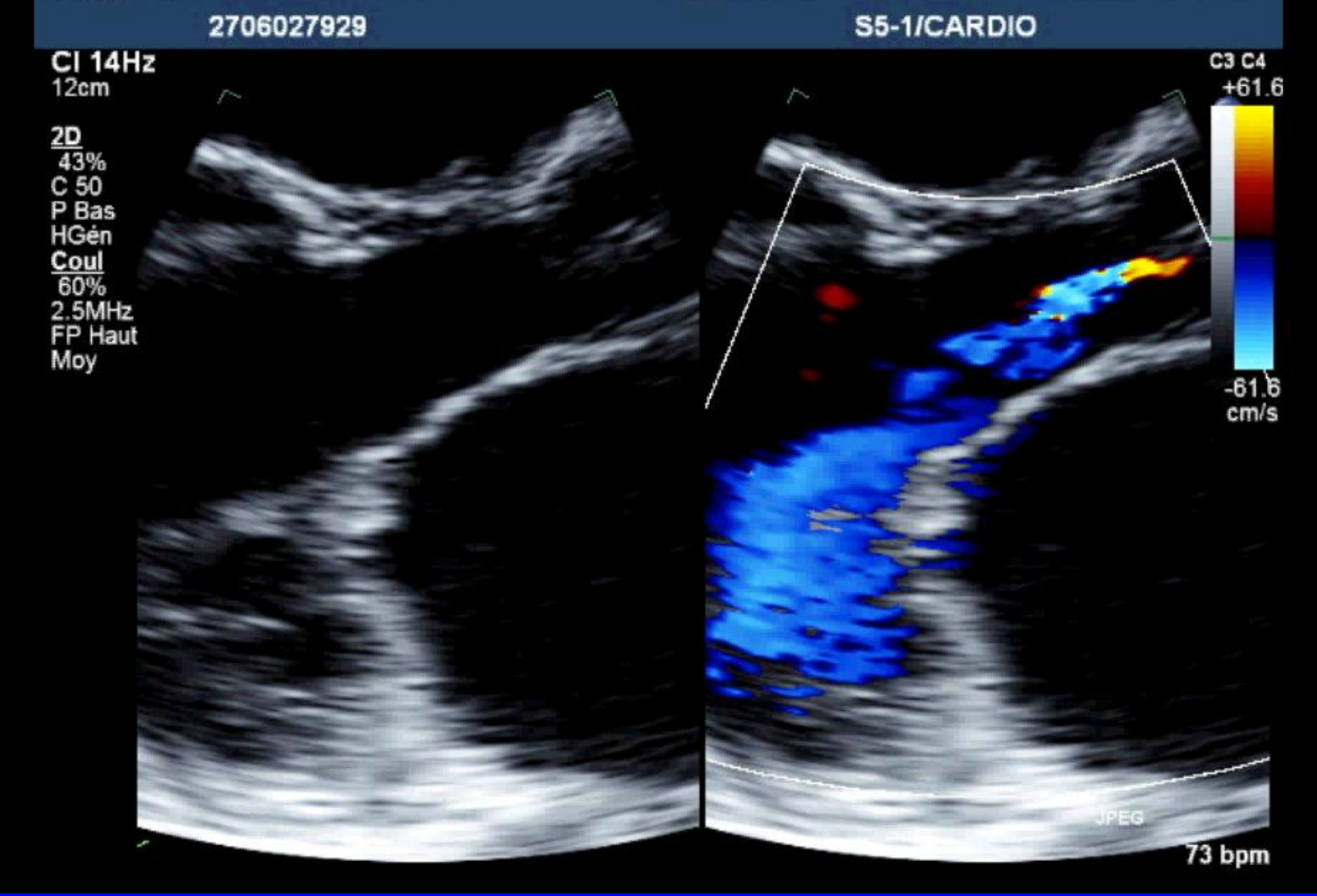
76 bpm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CI 14Hz
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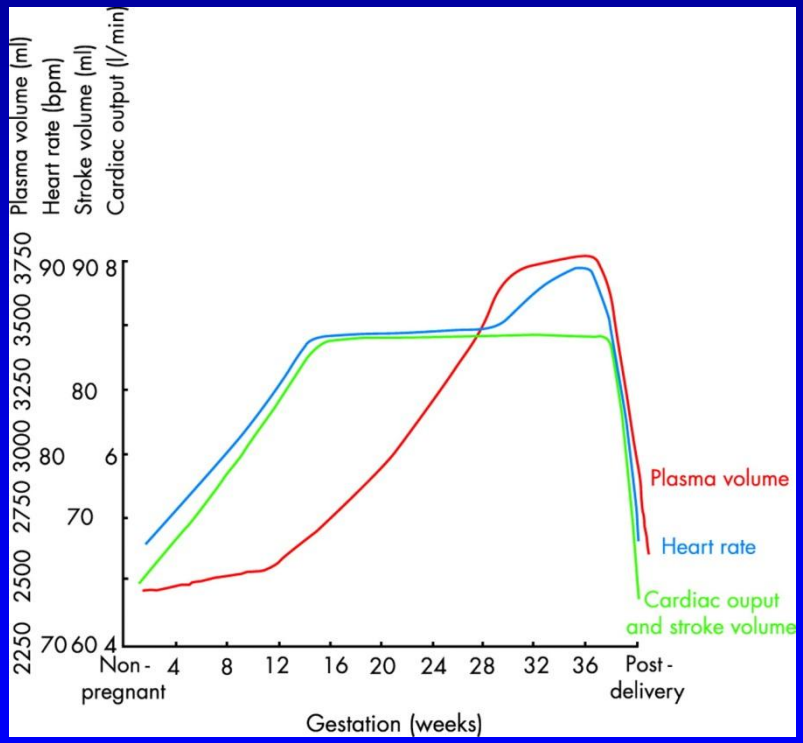
C 50
P Bas
HGén
Coul
60%
2.5MHz
FP Haut
Moy
C3 C4
+61.6
-61.6
cm/s
JPEG
73 bpm

Pregnancy Outcome

- Clinically stable in NYHA class II under beta-blockers
- TTE at 38th week : mean gradient 10 mmHg, sPAP 45 mmHg
- Vaginal delivery at 39th week under epidural analgesia and beta-blockers
- No dyspnea during labour and delivery
- Delivery of a healthy newborn
- No event post-partum

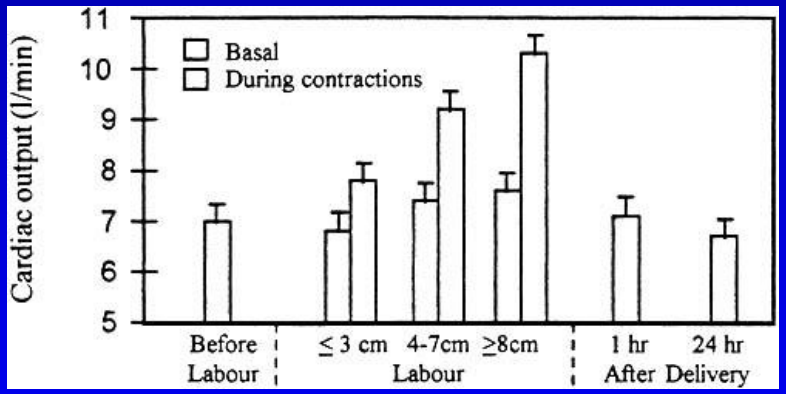
Haemodynamic Changes During Pregnanacy and Delivery

Pregnancy



Thorne
Heart 2004;90:450

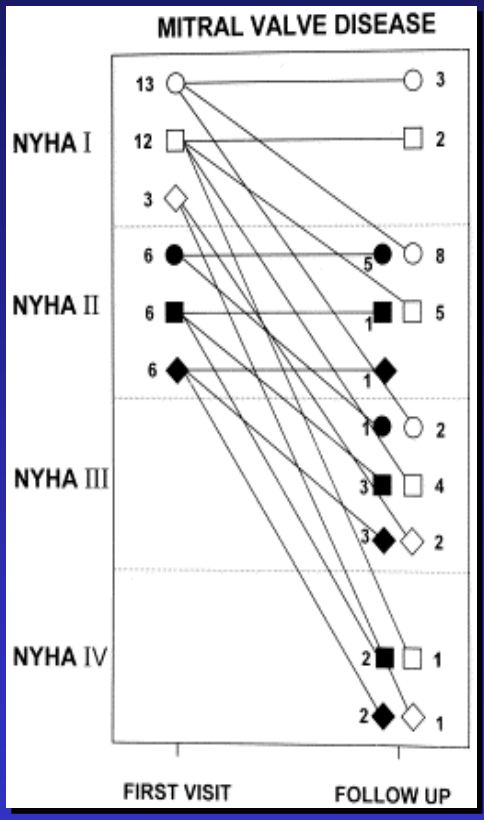
Delivery



(Hunter et al.
Br Med J 1992;68:540-3)

Mitral Stenosis and Pregnancy

↑ Blood volume
↑ Cardiac output poor tolerance
↑ Heart rate



- High risk of decompensation of severe MS (<1.5 cm^2) , even if good tolerance before pregnancy

  (Hameed et al. J Am Coll Cardiol 2001;37:893-9)

- Impairment of maternal and foetal prognosis

  Highest risk during 3rd trimester, delivery, and post-partum

Prognosis of MS During Pregnancy

- 35% maternal complications
  - 31% acute pulmonary oedema
  - 11% arrhythmias
  - 10% embolic events
  - 3% deaths

(Elkayam J Am Coll Cardiol 2005;46:223-30)

- Fœtal prognosis

	MS	Controls
Prematurity (%)	44	11
Intrauterine growth retardation (%)	33	0
Stillbirth (%)	11	0
Birth weight (Kg)	2.5	3.3

(Hameed et al. J Am Coll Cardiol 2001;37:893-9)

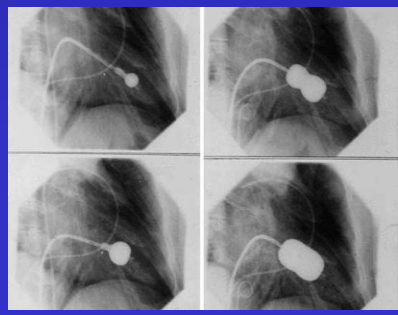
Mitral Stenosis and Pregnancy
Therapeutic Options

- Medical therapy

  ß blockers, rest, diuretics

- Surgery
  - Closed-heart commissurotomy (foetal deaths 2-10%)
  - Open-heart commissurotomy, MVR: high risk for the foetus related to cardiopulmonary bypass

    (death 20 - 30% + signs of foetal distress)



- Percutaneous mitral commissurotomy

  Good foetal and maternal tolerance

Cardiac Surgery Under Cardiopulmonary Bypass and Pregnancy

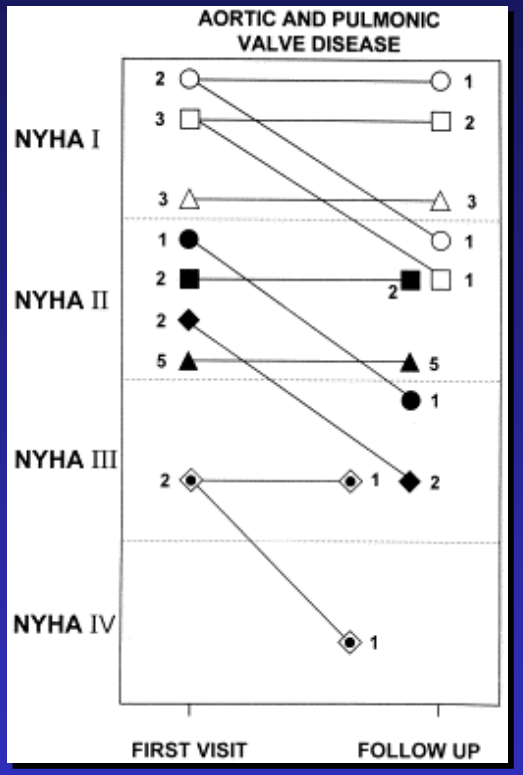
	Procedures (n=)	Maternal Deaths (%)	Foetal Deaths (%)
Becker et al. *Ann Thorac Surg 1983*	68	1.5	20
Parry et al. *Ann Thorac Surg 1996*	133	3	19
Arnoni et al. *Ann Thorac Surg 2003*	74	8.6	18.6

Aortic Stenosis and Pregnancy

- Low risk of decompensation if NYHA class I-II before pregnancy

  (Hameed et al. J Am Coll Cardiol 2001;37:893-9)

- Good tolerance if mean gradient < 50 mmHg during pregnancy



- Risk of complications if mean gradient > 50 mmHg and NYHA class III-IV
  - ➢ Consider intervention

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ESC Guidelines on the management of cardiovascular diseases during pregnancy

The Task Force on the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC)

Endorsed by the European Society of Gynecology (ESG), the Association for European Paediatric Cardiology (AEPC), and the German Society for Gender Medicine (DGesGM)

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Recommendations for the management of valvular heart disease

Table 9: Recommendations for the management of valvular heart disease		
Recommendations	**Class[a]**	**Level[b]**
Mitral stenosis		
In patients with symptoms or pulmonary hypertension, restricted activities and ß1-selective blockers are recommended.	I	B
Diuretics are recommended when congestive symptoms persist despite ß-blockers.	I	B
Patients with severe MS should undergo intervention before pregnancy.	I	C
Therapeutic anticoagulation is recommended in the case of atrial fibrillation, left atrial thrombosis, or prior embolism.	I	C
Percutaneous mitral commissurotomy should be considered in pregnant patients with severe symptoms or systolic pulmonary artery pressure >50 mmHg despite medical therapy.	IIa	C

Recommendations for the management of valvular heart disease

Recommendations	Class	Level
Aortic stenosis		
Patients with severe AS should undergo intervention pre-pregnancy if:		
• they are symptomatic	I	B
• or LV dysfunction (LVEF <50%) is present	I	C
Asymptomatic patients with severe AS should undergo intervention pre-pregnancy when they develop symptoms during exercise testing.	I	C
Asymptomatic patients with severe AS should be considered for intervention pre-pregnancy when a fall in blood pressure below baseline during exercise testing occurs.	IIa	C

Recommendations for the management of valvular heart disease

Recommendations	Class	Level
Regurgitant lesions		
Patients with severe aortic or mitral regurgitation and symptoms or impaired ventricular function or ventricular dilatation should be treated surgically pre-pregnancy.	I	C
Medical therapy is recommended in pregnant women with regurgitant lesions when symptoms occur.	I	C

Eur Heart J 2011, doi:10.1093/eurheartj/ehr218

Conclusion

- High-risk heart valve diseases during pregnancy
  - Stenotic valve diseases (mitral)
  - Marfan with aortic aneurysm
  - *Mechanical heart valve prostheses*
- Good tolerance of valve regurgitations
- Avoid surgery under cardiopulmonary bypass during pregnancy
- Evaluation and preventive treatment before pregnancy
- Multidisciplinary approach at all stages