

## Case report

# Mitral Stenosis and pregnancy

## How to manage this case?

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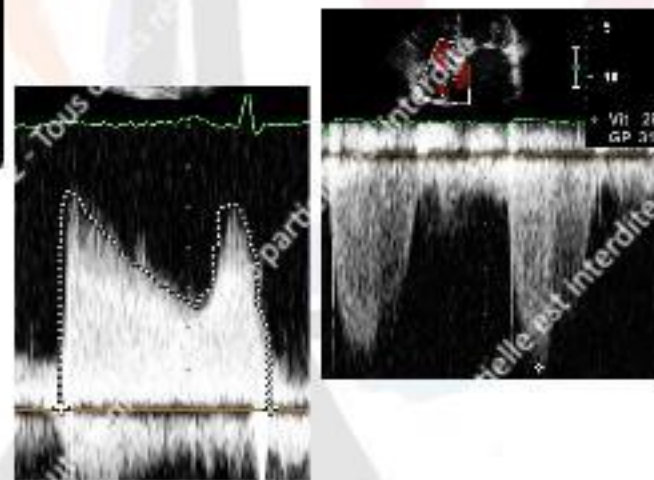
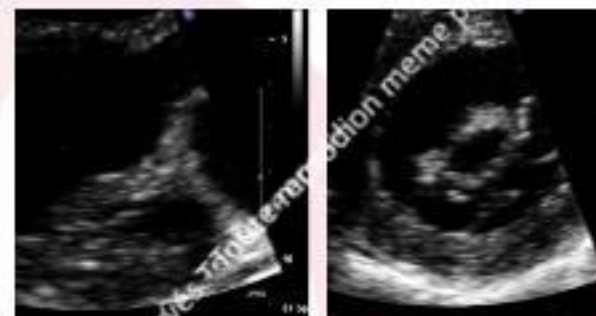
28<sup>th</sup> Congress of CNCH. Paris. November 23<sup>th</sup>-25<sup>th</sup> 2022

**Intervenant : Aicha AOUAD, Rabat, MAROC**

Je n'ai pas de lien d'intérêt potentiel à déclarer

## Case report

- 28 years old young lady , **primiparous**
- Background: History of recurrent angina
- Was known to have severe **mitral stenosis**
- Trans Thoracic Echocardiography prior to pregnancy: mitral stenosis
  - **Mitral area: 1.1 cm<sup>2</sup>**
  - **Mean mitral gradient: 8 mm Hg**
  - **SPAP: 35 mm HG au repos**
- Remained remarkably **asymptomatic despite critical MS.**



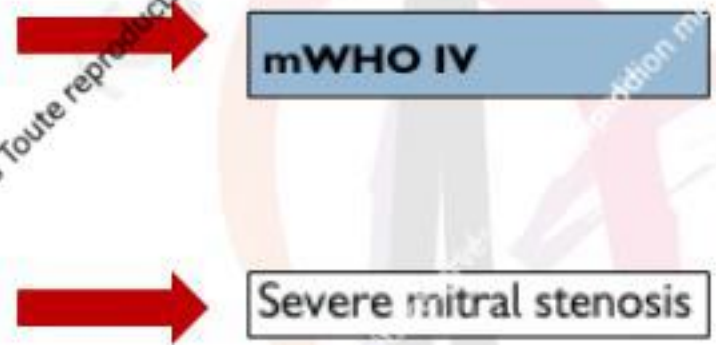
## Recommendations for classification of MS according to current guidelines

	Mild	Moderate	Severe
Direct findings			
Valve area	> 1.5 cm <sup>2</sup>	1.5 – 1 cm <sup>2</sup>	< 1 cm <sup>2</sup>
Supportive findings			
Mean pressure gradient *	< 5 mm Hg	5 – 10 mm Hg	> 10 mm Hg
Pulmonary artery pressure	< 30 mm Hg	30 – 50 mm Hg	> 50 mm Hg

\* In patients in sinus rhythm and heart rate < 80 bpm

# Modified World Health Organization Classification of maternal cardiovascular risk

	mWHO I	mWHO II	mWHO II-III	mWHO III	mWHO IV
<b>Diagnosis (if otherwise well and uncomplicated)</b>	Small or mild – pulmonary stenosis – patent ductus arteriosus – mitral valve prolapse Successfully repaired simple lesions (atrial or ventricular septal defect, patent ductus arteriosus, aortic valve stenosis, ventricular septal defect) Atrial or ventricular septal defects, repaired	Unoperated atrial or ventricular septal defect Repaired bicuspid aortic valve Pacemaker Pacemaker (supraventricular or ventricular) Tumor/synovium without aortic dilation	Mild left ventricular impairment (EF >45%) Hypertrophic cardiomyopathy Native or bicuspid aortic disease not considered WHO I or IV (mild aortic stenosis, moderate aortic stenosis) Marfan or other HTAD syndrome without aortic dilation Aortic >45 mm in bicuspid aortic valve pathology Repaired coarctation Aortic valve bicuspid	Moderate left ventricular impairment (EF 30–45%) Previous septum cardiac infarction without any residual left ventricular impairment Mechanical valve Systemic right ventricle with good or mildly decreased ventricular function Fontan circulation Otherwise the patient is well and the cardiac condition is uncomplicated Unrepaired congenital heart disease Other complex heart disease	Mild to moderate pulmonary hypertension Severe systemic ventricular dysfunction (EF <30% or NYHA class III–IV) Previous peripartum cardiomyopathy with residual left ventricular impairment <b>Severe mitral stenosis</b> Severe symptomatic aortic stenosis Systemic right ventricle with moderate or severely decreased ventricular function Severe aortic dilation (>45 mm in Marfan syndrome or other HTAD; >50 mm in bicuspid aortic valve, Turner syndrome AS >25 mm/m <sup>2</sup> , bicuspid aortic valve >50 mm) Vascular (Bicuspid Aortic Valve) Severe (re)coarctation Fontan with any complication
<b>Risk class</b>	<b>Risk of pregnancy by medical condition</b>				
<b>I</b>	No detectable increased risk of maternal mortality and no/only increase in morbidity.				
<b>II</b>	Small increased risk of maternal mortality or moderate increase in morbidity.				
<b>III</b>	Significantly increased risk of maternal mortality or severe morbidity. Inpatient counselling required. If pregnancy is decided upon, intensive specialist cardiac and obstetric monitoring needed throughout pregnancy, childbirth, and the puerperium.				
<b>IV</b>	Extremely high risk of maternal mortality or severe morbidity; pregnancy contraindicated. If pregnancy occurs termination should be discussed. If pregnancy continues, care as for class III.				

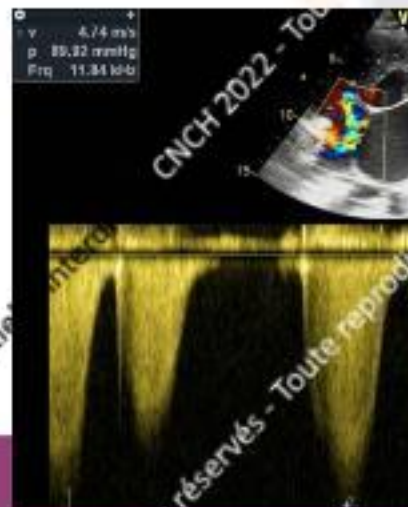
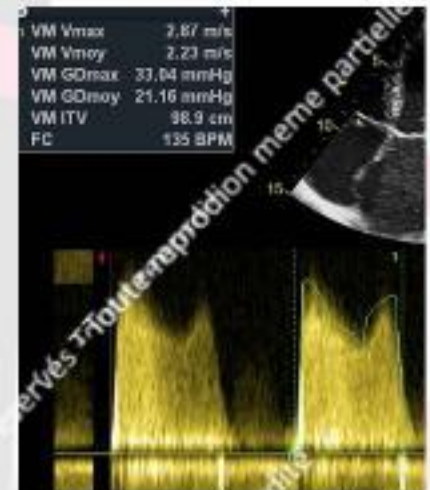


Eur Heart J 2011: 32, 3147–3297  
 Vera Regitz-Zagrosek. Eur Heart J 2018: 39, 3165–3241

## Case report

32 weeks:

- Functional status: NYHA III/IV and palpitations
- Peripheral oedema, crepitant murmurs
- Trans Thoracic Echocardiography
  - Mitral area:  $0.7 \text{ cm}^2$
  - Mean mitral gradient:  $21 \text{ mm Hg}$
  - SPAP:  $80 \text{ mm Hg}$
- Remained **symptomatic despite optimal medical treatment** (oxygen therapy, IV diuretics, and beta blockers)



# Cardiovascular changes during pregnancy and peri partum

The diagram illustrates the physiological changes during pregnancy and the peri partum period. At the center is a silhouette of a pregnant woman. Arrows point from various physiological states to this central figure:

- Myocardial oxygen consumption** (increases, indicated by an upward arrow)
- Vascular changes** (decreases, indicated by a downward arrow)
- Hypercoagulability state** (increases, indicated by an upward arrow)
- Level of thrombin** (increases, indicated by an upward arrow)
- Activity of anticoagulant factors (Protein C and S)** (decreases, indicated by a downward arrow)
- Fibrinolytic activity** (decreases, indicated by a downward arrow)

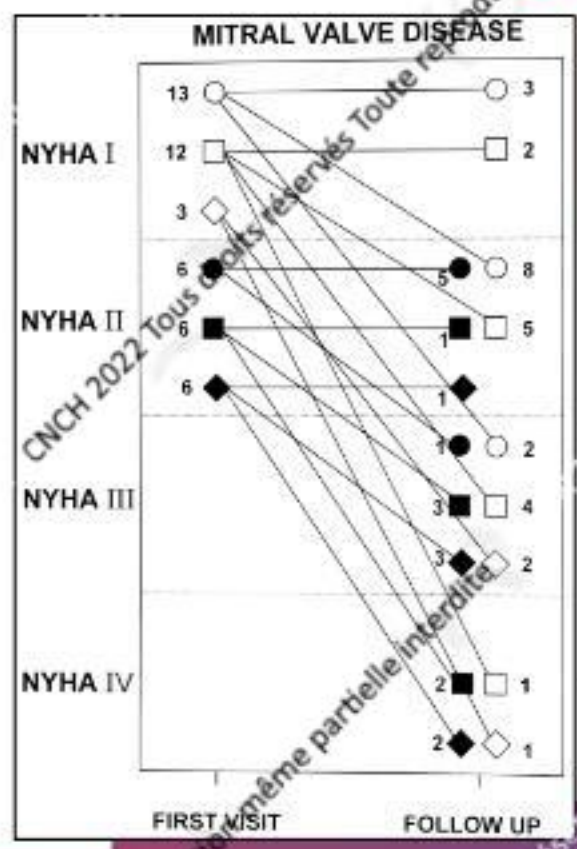
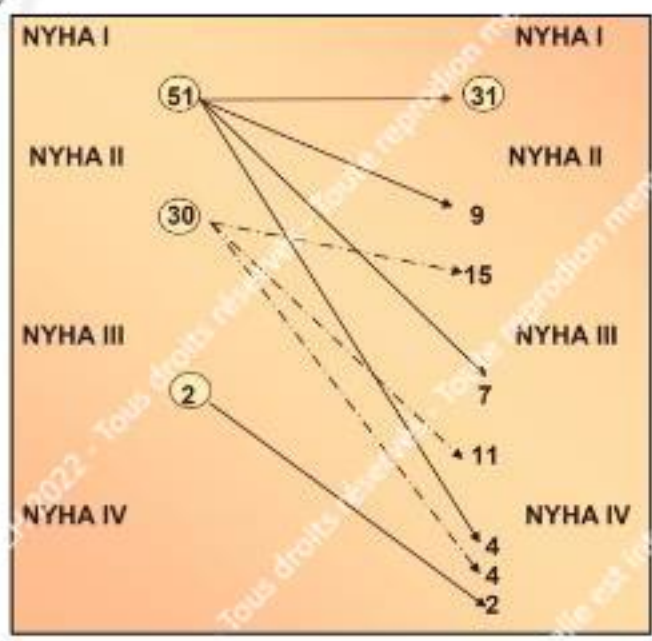
On the left, a bracket groups the following parameters:

- Frequency (increases, upward arrow)
- Stroke volume (increases, upward arrow)
- Blood volume (increases, upward arrow)
- Peripheral vascular resistance (decreases, downward arrow)

At the top, a graph shows the **Percent increase in cardiac output (% increase)** over **Weeks of gestation** (0 to 40). The curve shows a steady increase from 0% at week 0 to approximately 45% at week 20, peaking at about 50% around week 30, and then slightly declining to 40% by week 40.

Hemodynamic Parameter	Change during labor and delivery
Blood volume	↑
Heart rate	↑
Cardiac output	↑ (additional 50%)
Blood pressure	↑
Stroke volume	↑ (300-500 mL per contraction)
Systemic vascular resistance	↑

# Maternal complications: NYHA functional class changes



**Circles:** mild MS,  
**Squares:** moderate MS,  
**Diamonds:** severe MS  
**Open symbols:** NYHA I on presentation  
**Closed symbols:** NYHA II on presentation.

Benatta NF. Ann Cardiol Angeiol 2018; 274-79

Hameed J. J Am Coll Cardiol 2001; 38: 200-202





ESC

European Society  
of Cardiology

European Heart Journal (2018) **39**, 3165–3241  
doi:10.1093/eurheartj/ehy340

ESC GUIDELINES

# 2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy

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

## Recommendations for the management of native valvular heart disease

### Mitral stenosis

In patients with symptoms or pulmonary hypertension, restricted activities and beta-1-selective blockers are recommended. <sup>5,204</sup>	I	B
Diuretics are recommended when congestive symptoms persist despite beta-blockers. <sup>5</sup>	I	B
Intervention is recommended before pregnancy in patients with MS and valve area <1.0 cm <sup>2</sup> .	I	C
Therapeutic anticoagulation using heparins or VKA is recommended in case of atrial fibrillation, left atrial thrombosis, or prior embolism.	I	C
Intervention should be considered before pregnancy in patients with MS and valve area <1.5 cm <sup>2</sup> .	IIa	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

## Case report

28 years old young lady, primiparous , 32 weeks, with symptomatic severe mitral stenosis and SPAP despite optimal medical treatment.

Thrombopenie, Aneurysm of the interatrial septum

### How to manage this patient?

- Stop the pregnancy
- Surgery: Mitral valve replacement (mechanical valve)
- Surgery: Mitral valve replacement (biological valve)
- Percutaneous mitral commissurotomy

## Recommendations for the management of native valvular heart disease

### Mitral stenosis

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Percutaneous mitral commissurotomy should be considered in pregnant patients with severe symptoms or systolic pulmonary artery pressure $>50 \text{ mmHg}$ despite medical therapy.	IIa	C

## Contraindications for percutaneous mitral commissurotomy in rheumatic mitral stenosis

### Contraindications

MVA  $>1.5 \text{ cm}^{2a}$

LA thrombus

More than mild mitral regurgitation

Severe or bi-commissural calcification

Absence of commissural fusion

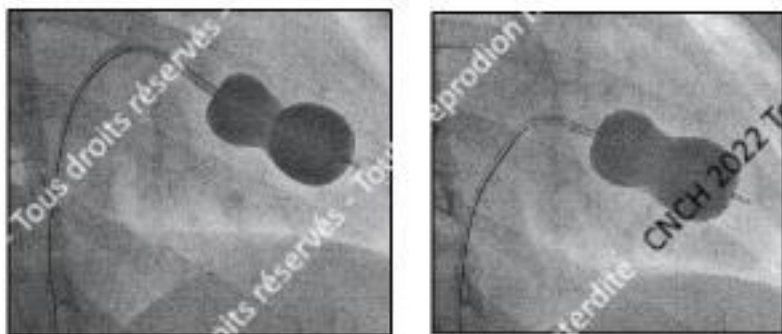
Severe concomitant aortic valve disease, or severe combined tricuspid stenosis and regurgitation requiring surgery

Concomitant CAD requiring bypass surgery

## Case report

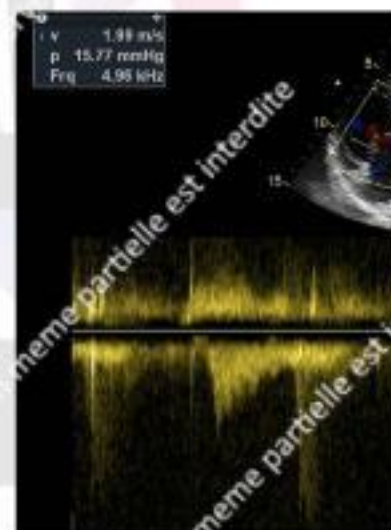
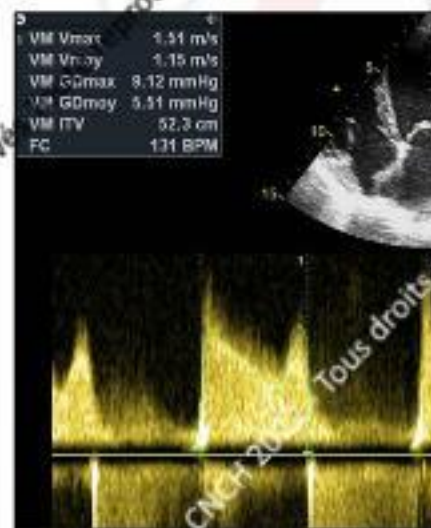
### Percutaneous mitral commissurotomy using Inoue Balloon technique

- Perfusion of red blood cells
- Fetale protection



### - Trans-thoracic Echocardiography

- Mitral area: 1.5 cm<sup>2</sup>
- Mean mitral gradient: 21 mm Hg
- SPAP: 30 mm Hg



## Case report

- **Follow up**
- Simple suites
- No bleeding complications
- Vaginal delivery at 38 weeks
- Healthy 2.8 kg newborn female

## Conclusion

- Pregnant women with MS are at **high risk of complications**
- Very close monitoring in a tertiary center with heart valve team
- Preconception counselling +++
- **Percutaneous valvuloplasty** using the Inoue balloon technique: treatment for patients with severe symptomatic mitral stenosis.



28<sup>ÈME</sup>  
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