Pregnant woman with congenital heart disease

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30 years old
D.o.B. 22/01/1980

Diagnosis of congenital heart disease at neonatal period

Cyanosis

Suspected critical pulmonary stenosis
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Neonatal Cardiac Catheterization:

- Pulmonary stenosis
- Suprasystemic right ventricular pressures
- Moderate tricuspid regurgitation
- Right to left shunt at atrial level, through patent foramen ovale (PFO)
- Post-stenotic dilatation of pulmonary trunk
- PDA not patent
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Surgery 25/01/1980 (3 days old)

- Sternotomy
- Bicaval clamping
- Pulmonary arteriotomy
- Pulmonary valvotomy

Surgical findings: puntiform orifice
Postoperative course: uneventful
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• Follow up at the Cardiology Pediatric unit and transferred to ACHD

• Normal development: active life, asymptomatic

• On follow up moderate to severe pulmonary regurgitation (PR) and mild right ventricular (RV) dilatation was present

• 2004: (24 y old): pregnancy completed
  No cardiac or obstetric complications except
  NYHA Class II at the end of pregnancy
  Spontaneous vaginal delivery
  Baby girl: 2900 g, APGAR 9/10
Question number 1

Which is the commonest residual lesion after surgical repair of pulmonary stenosis or Tetralogy of Fallot?

1. Pulmonary stenosis
2. Pulmonary regurgitation
3. Residual lesions are extremely infrequent and patients do not need follow up
4. In pulmonary stenosis, surgically relieved residual lesions are not common
Question number 1

Which is the commonest residual lesion after surgical repair of pulmonary stenosis or Tetralogy of Fallot?

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2009:
29 years old

Asymptomatic, NYHA I

- BP 110/60 mmHg, O2saturation air room 95%
  2/6 systolic murmur, single 2ond heart sound,
  2/4 diastolic murmur

- ECG: SR 65 bpm. Right axis deviation +90. rSR

And patient wants to be pregnant.....
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- Mild RV dilatation
- Normal RV systolic function

- Normal left sided structures
- Aneurysm of atrial septum
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- Severe PR
- Prominent Eustaquian membrane
- Mild to moderate TR
- Aneurysm of atrial septum
- Small L to R shunt PFO
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- Severe PR
- Diastolic RV disfunction
- Restrictive RV physiology
- RV to RA pressure 25 mmHG
Question number 2
What kind of risk do you think has got the patient, the fetus and neonate if pregnancy?

1. PR is a risk factor for maternal complications, as well as prior cardiac events

2. Prior cardiac events, are also predictors of fetal and neonatal complications, mainly intrauterine growth retardation and prematurity

3. Global risk of transmission or recurrence of CHD is around 4%

4. There is a 9-10% risk of maternal complications, mainly heart failure or arrythmia, usually respond to treatment

5. All previous sentences are correct

Question number 2

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Question number 3

So what do we answer to the patient, can I become pregnant?

1. No, you can not be pregnant

2. Yes, go ahead, no problem at all

3. There is some risk, we will discuss it next year, today the outpatient clinic is very busy

4. There is some risk, we will perform some more tests and discuss with you issues regarding risks for you and your baby at the preconceptional clinic

P Steer and M Gatzoulis, Heart Disease and Pregnancy, RCOG 2006
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Question number 3

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1. No, you can not be pregnant

2. Yes, go ahead, no problem at all

3. There is some risk, we will discuss it next year, today the outpatient clinic is very busy

4. There is some risk, we will perform some test to evaluate you and discuss with you issues regarding risks for you and your baby at the preconceptional clinic

P Steer and M Gatzoulis, Heart Disease and Pregnancy, RCOG 2006
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Our plan...

Book cardiac MRI, exercise test MVO2
Discuss risk in Preconceptional assessment clinic

First International meeting on Pregnancy and Heart Disease, Valencia 2010, Pijuan et al.
Our plan...

Book cardiac MRI, exercise test
Preconceptional assessment clinic

Patient’s plan...

She felt ok to be pregnant
Pregnancy went on and controled locally
36 week pregnant

- Followed up locally, normal fetal growth, no obstetric complications
- Progressive shortness of breath from 30th week, and transferred to emergency room

Physical findings:

BP 100/60 mmHG,
Mild cyanosis, Air room O2 saturation 87%
Ankle edema
No respiratory difficulty at rest, chest clear
Normal first single 2 heart sound a 95 bpm,
2/6 systolic murmur, short diastolic murmur 2/4
ECG: SR at 80. Right axis deviation, rSR pattern
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Question number 4

Which do you think is the most plausible diagnosis?

1. Acute pulmonary embolism

2. Desaturation during last trimester of pregnancy is normal, patient has normal findings for a pregnant woman

3. Acute pneumonia

4. Volume overload, diastolic RV failure with inversion of shunt through a PFO and subsequent desaturation
Question number 4

Which do you think is the most plausible diagnosis

1. Acute pulmonary embolism (PE)

2. Desaturation during last trimester of pregnancy is normal, patient has normal findings for a pregnant woman

3. Acute pneumonia

4. Volume overload, diastolic RV failure with inversion of shunt through a PFO and subsequent desaturation
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Question number 5

If the patient had not cardiac disease
Which do you think is the most plausible diagnosis?

1. Acute pulmonary embolism (PE)

2. Desaturation during last trimester of pregnancy is normal, patient has normal findings for a pregnant woman

3. Acute pneumonia

4. Volume overload, diastolic RV failure with inversion of shunt through a PFO and subsequent desaturation
Question number 5

If the patient had not cardiac disease
Which do you think is the most plausible diagnosis?

1. Acute pulmonary embolism

2. Desaturation during last trimester of pregnancy is normal, patient has normal findings for a pregnant woman

3. Acute pneumonia

4. Volume overload, diastolic RV failure with inversion of shunt through a PFO and subsequent desaturation
Blood tests: Hb 10.3g/L, Ht 30.8%, White cells 10.100, Platelets 237.000; QT 112% D-dimer: 2610, Glu 95; Urea 23; Cr 0.68; Na 140; K 3.47

CUS: compression ultrasound leg vein imaging normal, no thrombus

Echocardiogram:
- Right ventricular dilatation
- Normal RV systolic function
- Normal left sided structures
- Free PR, no progression of TR
- Peak TR= 2.2 m/s, no pulmonary arterial hypertension
- Marked RV diastolic dysfunction
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- Normal left sided structures
- Mild to moderate TR, free PR
- Normal RV systolic function
- RV dilatation
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RV restrictive physiology
Increased flow from IVC
Shunt through PFO not visible
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Question number 6

Which of the following is not indicated for our patient?

1. Fetal monitoring
2. Admission, bed rest, and fluid restriction
3. ACE inhibitors
4. Prophylactic use of LMH and care of venous lines, including use of air filters
5. 1 to 4 are all correct
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Question number 6

Which of the following is not indicated for our patient?

1. Fetal monitoring
2. Admission, bed rest, and fluid restriction
3. ACE inhibitors
4. Prophylactic use of LMH and fastidious care of lines, including use of air filters
5. 1 to 4 are all correct
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Treatment:

- Admission
- Bed rest, O2 supplementation, restriction of fluids,
- LMH
- Fetal monitoring
- Air filter

During admission patient had uneventful course, fetal status correct
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Question number 7

Which mode of delivery would you choose?

1. Emergent C-section

2. Elective next day C-section after pulmonary maturation

3. Vaginal delivery without epidural anesthesia to avoid hypotension

4. Spontaneous onset of labour with epidural anaesthesia, limit second stage of delivery to minimise pain and anxiety
Question number 7

Which mode of delivery would you choose?

1. Emergent C-section
2. Programmed next day C-section after pulmonary maturation
3. Induced vaginal delivery without epidural anaesthesia to avoid hypotension
4. Spontaneous onset of labour, limit second stage of delivery with epidural anaesthesia to minimise pain and anxiety
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**Delivery**

- 38.5w epidural anesthesia,
- Spontaneous vaginal delivery,
- Baby boy 2930g, APGAR 9/10

**Postpartum period:**

- Postpartum period
- Peripheral edemas disappeared
- O2 Sat went back to 93-94%
- Breast feeding
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- Transthoracic contrast Echo was performed

- Basal right to left shunt through PFO
Question number 8
Which do you think is the correct answer regarding postpartum period?

1. 1 day stay at the hospital and discharge, cardiac problems disease occur almost only at delivery

2. Surgical pulmonary valve replacement and PFO closure at immediate peripartum period

3. Careful postpartum follow up, balance fluid shift, maintaining LMH

4. Careful postpartum follow up, balance fluid shift, maintaining LMH and outpatient appointment during first month
Question number 8
Which do you think is the correct answer regarding postpartum period?

1. 1 day stay at the hospital and discharge, cardiac problems disease occur almost only at delivery

2. Surgical pulmonary valve replacement and PFO closure at immediate peripartum period

3. Careful postpartum follow up, balance fluid shift, maintaining LMH

4. Careful postpartum follow up, balance fluid shift, maintaining LMH and outpatient appointment during first month
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Question number 9

Which do you think are key issues in pregnancy and CHD?

1. Prepregnancy counselling

2. Multidisciplinary team management

3. Fetal echocardiography to all patients as risk of transmission is 5-10%

4. Careful plan for labour, high level of maternal surveillance during postpartum

5. 1 to 4 are correct
Question number 9

Which do you think are key issues in pregnancy and CHD?

1. Prepregnancy counselling

2. Multidisciplinary team

3. Fetal echocardiography to all patients as risk of transmission is 5-10%

4. Careful plan for labour, spontaneous onset and high level of maternal surveillance during postpartum

5. 1 to 4 are correct
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Slide for guidelines if published on Sunday regarding

Pre-pregnancy risk assessment
Vaginal delivery is first choice.
6 months later: NYHA II, O2 Sat 93-94%
MRI: RVEF 61 % Regurgitant fraction PR 38%
RA dilatation 24 cm², LVEF 58%
Exercise test MVO2: duration 9 min, 75% of predicted
Accepted for FFO closure and PVR
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THANK YOU!!