Mechanical Heart Valve Thrombosis in early Pregnancy

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A 33 y.o woman 4 weeks pregnant was referred for anticoagulation management.

She underwent double mechanical valve replacement (St Jude Medical in the aortic and Carbomedics in the mitral position) and tricuspid valve repair at age 18 due to rheumatic heart disease.

She had 4 previous pregnancies complicated by miscarriages as well as two bleeding events and bacterial endocarditis event (treated with warfarin and IV UFH).
At the time of consultation she was mildly symptomatic with slight fatigue during regular exercise.

The patient had labile INR levels on high warfarin dose (10 to 15 mg daily) and her INR level at that time was 1.6.
Echocardiography study at her initial visit revealed:

- An elevated MV with mean grad. of 11 mmHg and a normally functioning prosthetic AV with mean grad. of 18 mm Hg and SPAP of 42 mmHg

- She was urged to get hospitalized for further evaluation and treatment but refused to do so

- She was recommended to switch from warfarin to subcutaneous enoxaparin 70 mg (1mg/kg) bid titrated by anti-Xa factor levels.
She returned only on the 10th week of pregnancy complaining of progressive fatigue and exertional dyspnea.

A repeat TTE study demonstrated a severely elevated mean grad. of 18 mmHg across the MV severe TR and increased SPAP of 65 mm Hg.

An X-ray fluoroscopy and a transesophageal echocardiography study showed an immobile posterior mitral leaflet consistent with valve thrombosis.
Mechanical mitral valve thrombosis
She was admitted to CCU and refused any intervention and was started on IV UFH titrated according to aPTT 2-2.5.

Aspirin, metoprolol and furosemide were also initiated.

On this treatment, a week later MV mean grad. decreased from 18 to 11 mm Hg
At that time the patient developed severe abdominal and a drop in haemoglobin level to 8 gm/dl.

An abdominal-pelvic CT study confirmed huge psoas and retroperitoneal hematomas with nerve impairment.

She received blood transfusions and after the bleeding was controlled she was switched to subcutaneous low molecular heparin (LMWH) enoxaparin throughout the rest of the pregnancy.
LMWH dosage was titrated according to both target trough anti-Xa levels of 0.8 U/ml and peak levels of 1.2-1.5 U/ml.
A final TTE on the 37th week of pregnancy revealed a normalized transmitral MPG of 5 mm Hg and a fluoroscopy study showed normal prosthetic valve mitral leaflet movement.
She was then transitioned from LMWH to UFH 48 hours after which elective caesarean section was performed resulting in the delivery of a healthy baby and uneventful recovery of the mother.

Post partum echo revealed normal function of both prosthetic valve and moderate to severe TR

She was feeling good and was in FC 2

She was strongly advised against another pregnancy
However,

- 2 years later she returned pregnant, 6th week, FC 2
She was switched from Warfarin 15 mg to LMWH 1mg/kgX2 with Anti-Xa trough and peak levels monitoring
Our management plan

- Multidisciplinary team follow-up

- Both, trough and peak anti-Xa levels, monitoring initially every 3 days until the target anti-Xa level will be achieved and after that at least every 2 weeks.

- The cesarean section was planned at 38 weeks of gestation, with withdraw of LMWH and substitute with UFH.

- An admission on 35 week for close follow-up

- Depending on the degree of uterine bleeding, dose adjusted UFH re-initiation 12 hours after delivery.
At week 35 she was switched to UFH IV (aPTT X 2-2.5)

At 35+2 she started with contractions, followed by rapid AF and pulmonary congestion

She underwent c/s and after 24 hours on UFH IV, but developed severe post-op bleeding with re-operation and blood transfusion followed by fever

Finally she recovered and was discharged in stable condition and with a healthy baby boy.
Pregnancy in women with MPHV carries very high risk

- Previous miscarriages on warfarin
- Bleeding and SBE with prolonged hospitalization on IV Heparin
- Early pregnancy valve thrombosis due to poorly controlled warfarin treatment and partly non-compliance to come for anti-Xa levels monitoring on LMWH
Take away messages

- The use of warfarin may be simple but is associated with an fetal loss and embryopathy.

- These risks are not accepted by many women and therefore the recommendations to use warfarin throughout pregnancy for all patients are not practical.

- The use IV UFH requires long hospitalization, IV access, that may result in complication such as bacteremia, etc...
Take away messages

- There is increasing information to suggest that the use of LMWH in a dose adjusted to achieve therapeutic level of anticoagulation as indicated by a therapeutic trough levels is safe and effective.

- An intense follow up of Anti-Xa levels may not be feasible in all institutions especially in developing countries.

- In the US and Europe however, this is feasible in many medical centers, especially those who specialize in the care of women with high risk pregnancies.
The management of pregnant patients with mechanical heart valve should be done in centers with experience and capability for close monitoring of the level of anticoagulation.