



Case report

Successful management of postpartum hemorrhage and surgical site infection in a pregnant woman under warfarin for heart valve replacement: A case report

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ABSTRACT

Introduction and importance: Pregnant women under warfarin for mechanical heart valves can pose a variety of challenges which requires fine tuning of various anticoagulants throughout the pregnancy and in the postpartum period as hemorrhage can lead to maternal and fetal morbidity and mortality.

Case presentation: A 36-year-old woman gravida two, para one at 35 weeks 5 days gestation, with hypothyroidism with mitral valve replacement and tricuspid valve repair due to rheumatic heart disease underwent emergency lower section cesarean section for fetal bradycardia. B-lynch suturing was eventually done to control atonic postpartum hemorrhage. During hospital stay she developed surgical site infection of abdominal skin incision site which was also subsequently managed. Postpartum anticoagulation was started late due to postpartum hemorrhage and finally the patient was discharged on warfarin.

Clinical discussion: There is always a risk of both thromboembolic and hemorrhagic manifestations in a pregnant woman with a prosthetic heart valve which requires fine tuning of anticoagulants throughout the pregnancy and in the postpartum period. Hemorrhagic manifestation in the form of postpartum hemorrhage is common which can be difficult to manage and also poses a great dilemma in restarting the anticoagulation after delivery. Excessive blood loss can itself lead to mortality and morbidity, and also via increased risk of surgical site infection.

Conclusion: Appropriate preconception counseling along with meticulous assessment, management and monitoring of pregnant women with prosthetic heart valves is necessary to decrease fetal and maternal morbidity and mortality.

1. Introduction

With the advancement in treatment of valvular heart disease, women in the reproductive age with a mechanical heart valve (MHV) are growingly pursuing pregnancy and hence need unyielding control of anticoagulation throughout gestation [1]. Warfarin and unfractionated heparin (UFH) or low molecular weight heparin (LMWH) are the most commonly used anticoagulants in various phases of pregnancy and postpartum period to attain adequate anticoagulation. In spite of the increased risk of thrombosis in the women with MHV, the peripartum period also presents a great bleeding risk, and hemorrhage remains the prime factor of maternal death in various countries worldwide [2]. With

the impact of physiological changes of pregnancy and labor on these patients, there can be distinctive challenges presented to clinicians especially when they are lost to follow-up and present in an emergency.

Here we report a case of successful management of postpartum hemorrhage (PPH) and surgical site infection (SSI) in pregnancy after heart valve replacement under warfarin therapy at 35 weeks 5 days of gestation. This case has been reported in line with SCARE criteria [3].

2. Case presentation

A 36-year-old woman G₂P₁ at 35 weeks 5 days gestation with hypothyroidism for the last 6 years, who underwent mitral valve

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replacement and tricuspid valve repair 9 years back due to rheumatic heart disease presented to the emergency department with decreased fetal movement and abdominal pain for one day. Her previous obstetric history included a 3.5 kg male child born through lower segment cesarean section (LSCS) for meconium-stained liquor at term without any peripartum complications two years back. This pregnancy was planned and hence her usual warfarin 5 mg was changed to LMWH for the first three months. Warfarin was then continued from the second trimester. Anomaly scan revealed no detectable fetal anomalies. She was perceiving good fetal movements and there was no history of any per vaginal bleeding in the third trimester.

When she presented to the emergency department, she was afebrile, pulse rate was 80 beats per minute, blood pressure of 100/60 mmHg and oxygen saturation of 96 % in room air. Per abdominal examination revealed term size uterus with longitudinal lie and cephalic presentation. Fetal heart rate on auscultation was 144 beats per minute. Two contractions were present in 10 min with each contraction lasting for 15 s. Per vaginal examination revealed external os of 1 cm, soft, central, 10 % effaced with head station of -2 and presence of membrane but not show, giving bishop score of 5. Ultrasonography of abdomen showed single live intrauterine pregnancy of 35 weeks 2 days of gestation in cephalic presentation with placenta in posterior upper uterine segment, amniotic fluid index of 12.6 cm and estimated fetal weight of 2582 g. Her blood investigation revealed hemoglobin 7.7 g/dL, platelet 219,000/cumm, white blood cell count 6700/cumm, red blood cell count 5 million/cumm, creatinine 0.77 mg/dL, prothrombin time (PT) 44 and international normalized ratio (INR) 3.66. She received injection drotaverine 80 mg for the abdominal pain and dexamethasone 12 mg intramuscular and was then admitted. Her warfarin was put on hold and she received two doses of plain tablet nifedipine 10 mg at the interval of 10 min for tocolysis. One pint of packed red blood cells (PRBCs) and four pints of fresh frozen plasma (FFP) were transfused. On the repeat PV examination, the bishop's score was still 5. There was no scar tenderness. Fetal heart rate dropped to 80 beats per minute and she underwent emergency LSCS under general anesthesia.

Per-operatively lower uterine segment was well formed, previous scar site was intact, baby presented by cephalic right occipito-posterior in position and placenta in posterior upper uterine segment. Single alive female baby was delivered with a birth weight of 2 kg. Following delivery of placenta, uterine atony was noted and oxytocin 10 U was started in 1 pint of lactated ringer's. Intramyometrial injection carbo-prost 250 micrograms was given for 3 doses, 15 min apart. With bleeding not controlled, B-lynch suture was applied. Intraoperatively, 3-pints PRBCs and 4-pints FFPs were transfused. The patient was then transferred to the intensive care unit (ICU), intubated where 2 pints FFP were transfused. She was extubated the next day and then shifted to general ward with subcutaneous injection of LMWH 60 mg twice daily. After three days, she developed hematuria. Renal function test was normal and hemoglobin was 8.5. One pint of PRBC was transfused and LMWH was discontinued. She also developed infection in the abdominal skin incision site due to which she had fever of 101.9-degree Fahrenheit. Wound was opened, pus drained and twice daily dressing was done. After three days of discontinuation, injection LMWH 40 mg once daily was started when INR was found to be 1.75. Antibiotics were started according to pus culture and sensitivity which revealed coagulase negative staphylococcus (CONS) sensitive to flucloxacillin. Secondary suturing of the abdominal wound was done after 11 days and warfarin was started the next day. She was discharged after 3 days on warfarin 4 mg and tablet metoprolol 12.5 mg once daily after cardiology consultation. During the follow up examination she and her child are doing well 3 months after surgery.

3. Discussion

Presence of MVH in pregnancy is rare and the induction of an anticoagulant agent for MVH counteracts the prothrombotic environment of

normal pregnancy [4,5]. There is an approximate risk of 7 to 23 % of thromboembolic and hemorrhagic complications in patients with prosthetic heart valves during pregnancy with only 58 % of the patients with metallic prosthesis having difficulty free pregnancy and postpartum period [6–9]. Once the pregnancy is confirmed, patients should be started on UFH or LMWH to avert the teratogenic effect of warfarin. Warfarin can be resumed from the second trimester and continued till term. At term, patients should be once again switched over to UFH or LMWH to prevent warfarin-induced immoderate bleeding [10,11]. Our patient directly presented at late 35+ week to emergency department thus preventing any bridging with UFH or LMWH and only warfarin discontinuation could be done when she underwent emergency LSCS shortly after presentation, which might have resulted in warfarin-induced coagulopathy thus causing primary PPH. In a descriptive retrospective study by Irani et al., hemorrhagic complications occurred in 6 out of 14 pregnancies under warfarin [12]. Further, the rate of hemorrhagic complications was 12.8 % with the majority being PPH (80 %) in a retrospective chart review of women delivering in an academic teaching hospital done by Wang et al [13]. The rate of PPH in the patients receiving anticoagulant agents is greater than the 2.9–6 % reported incidence of PPH in unselected obstetric populations [14–16]. Additionally, population-based descriptive study done by Vause et al., reported that women with MHV suffered from elevated rates of maternal mortality and morbidity with a huge number of morbidities arising from hemorrhagic impediment experienced in the postpartum period [4].

Prothrombin complex concentrate (PCC) transfusion is the most efficacious strategy to countermand warfarin-induced coagulopathy acutely with supremacy of PCC over FFP including likely more complete correction and absence of volume overload [17]. Due to nonavailability of PCC in our center, we transfused FFP to our patient while she was being managed for PPH and also afterwards in the ICU setting.

In a hospital-based case control study by Kvalvik et al., emergency cesarean section (CS) was a significant risk factor, along with blood transfusion during or after CS for developing SSI after CS [18]. One plausible rationale for increased SSI after blood transfusion following severe blood loss could be the fact that blood loss not only exhausts the patient of red blood cells but also white blood cells, which play a chief role in imparting an immune reaction [19]. Further, an increase in the risk of infectious morbidity after transfusion of blood products have been shown by studies from other fields apart from obstetrics [20]. Our patient underwent emergency CS for fetal bradycardia and she also received multiple blood transfusions both during and after CS because of blood loss due to primary PPH. These factors could have led to SSI in our case.

There are no clinical trials evaluating the best time to start postpartum anticoagulation [21]. Prophylactic anticoagulation can be reinitiated 4 to 8 h after vaginal delivery and 8 to 12 h after cesarean delivery in the absence of any affirmation of hemorrhage [22]. The optimal time to restart anticoagulant therapy in the postpartum period for women with MHV is still unclear because these guidelines are focused toward women treated for thromboembolism in pregnancy and are not specific for women with MHV [21]. Our patient had primary PPH which was controlled only after B-lynch suture application and hence the early introduction of anticoagulation was deferred until 2 days after which LMWH was started. As she again developed hemorrhagic manifestation in the form of hematuria, LMWH was discontinued after 3 days of initiation. Finally, LMWH was reintroduced after 3 days of discontinuation and eventually the patient was discharged in warfarin alone after bridging therapy.

The task of balancing the competing risk of bleeding versus thrombosis is very difficult for the clinicians in the pregnant patients with MHV on anticoagulants [23]. Peripartum anticoagulation induces a bleeding risk and a more aggressive dosing, as in therapeutic versus prophylactic, contributes to more risk [23]. This situation is made even harder due to absence of evidence-based guidelines directing clinicians to manage peripartum anticoagulation balancing the risk of thrombosis

and bleeding [21]. Discontinuation of adjusted-dose of UFH or LMWH 24 h prior to a planned delivery so as to avoid an unwelcome anticoagulant effect, especially with accompanying neuraxial anesthesia has been suggested by the 2012 American College of Chest Physicians (ACCP) guidelines on antithrombotic therapy [23]. However, prior to planned delivery, spontaneous labor can occur, women may not desire induction of labor or planned cesarean section. Further, patients can present in an emergency requiring emergency CS which gives no time to stop warfarin and introduction of UFH or LMWH, as occurred in our case.

4. Conclusion

There is always a clinical quandary in women regarding anticoagulation in pregnancy which focuses on balancing the risks of bleeding and thrombosis which can be made challenging when the woman is lost to follow-up or she presents in the emergency requiring immediate obstetric management. With the rise in pregnancy with mechanical heart valves, there should be meticulous counseling in the preconceptional time beforehand as well as appropriate assessment, management and monitoring is required throughout the pregnancy and in the postpartum period in order to prevent mortality and morbidity to the mother and fetus.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Declaration of competing interest

None to declare.

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Author contribution

Alina Tandukar (AT), Kritika Jha (KJ), Pooja Paudyal (PP), Neeta Katwal (NK) and Suniti Joshi Rawal (SJR) = Study concept, data collection, and surgical therapy for the patient.

Roshan Aryal (RA) and Alina Tandukar (AT) = Writing- original draft preparation.

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