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CASE REPORTS

Postpartum Aortic Bifurcation Thrombosis on the Background of Thrombophilic Disorder

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ABSTRACT

Two main causes of arterial thrombosis are known: first - atherosclerosis, extensively studied, and the second - atrial fibrillation. The lack of any risk factors and the occurrence at young age of a thrombotic event requires us to investigate possible other conditions, including inherited thrombophilia that is represented by a series of genetic disorders that increase the risk of thromboembolic disease. The role of thrombophilia in the occurrence of arterial thrombosis is inconsequential; this disorder is characterized by the tendency of developing venous thrombosis. We present a rare case of a 29 year old woman that presents an arterial thrombotic event subsequent to the caesarean section. The patient had a positive familial history for thrombotic events and a cavernous sinus thrombosis in personal history. Prophylactic treatment with unfractionated heparin throughout pregnancy was applied. At 31 weeks gestation the patient underwent cesarean surgery for nonreassuring fetal status, 2 weeks fetal intrauterine growth restriction and absent diastolic flow of uterine arteries. Three days post operatory arterial thrombosis is suspected. The context that led to this suspicion was paresthesia, color modification of the right leg and abolished popliteal pulse. Angiographic-CT confirmed the presumptive diagnosis. A cardiovascular, conservatory treatment was successfully applied. Considering the particularities of the presented case we discuss the occurrence of arterial thrombosis postpartum in the context of confirmed thrombophilia by reviewing the specialized literature.

Keywords: Thrombophilia, arterial thrombosis, pregnancy

BACKGROUND

Two main causes of arterial thrombosis are known, atherosclerosis, extensively studied, and atrial fibrillation. The listed above pathologies when appearing are accompanied by specific risk factors that confirm the suspected diagnosis. Some of these risk factors are obesity, high parity and immobilization. Uncommonly arterial clots can occur in persons less than 40 or 50 years of age who do not have arteriosclerosis or atrial fibrillation (1). The lack of any risk factors and the occurrence at young age of a

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thrombotic event requires us to investigate genetic disorders that increase the risk of thromboembolic disease. If this genetic disorder overlaps the gestation period, the risk of a thrombotic event occurrence is increased due to the hypercoagulable state produced by normal pregnancy-associated changes. Most frequently, events occur in peripartum or postpartum period (2). The coagulation changes induced by parturiency are (3):

- Resistance to activated protein C increase in the second and third trimesters
- Protein S activity decrease due to reductions in total and free protein S antigen
- Fibrinogen and factors II, VII, VIII and X increase
- Levels and activity of the fibrinolytic inhibitors, thrombin activator fibrinolytic inhibitor (TAFI), plasminogen activator inhibitor type 1 (PAI-1) and PAI-2 increase

The role of thrombophilia in the occurrence of arterial thrombosis is inconsequential; these disorders are characterized by the tendency for venous thrombosis. The most frequently encountered thrombophilic conditions are: antithrombin III deficiency, protein C deficiency, protein S deficiency, activated protein C resistance resulting from factor V Leiden mutation, elevated prothrombin activity associated with mutation in the prothrombin gene, and hyperhomocystinemia (4). A prevalent satellite impact of inherited thrombophilia during pregnancy is intrauterine growth restriction and preeclampsia (5). Proper management of thrombophilia during pregnancy is essential in order to avoid these consequences. Therapeutic levels of unfractioned heparin or low molecular weight heparin are the preferential treatment for thrombotic events caused by inherited thrombophilia. During pregnancy, in women with thrombophilic disorders, a prophylactic treatment with low molecular weight heparin in adapted doses is preferential. Postpartum therapy with either heparin or warfarin is required in all cases (6). ❑

CASE REPORT

We present a rare case of arterial postpartum thrombosis in a 29 year old woman with diagnosed thrombophilia. We mention a personal and family history of thrombotic events, two gestations, regular menstrual periods of 28 days, menarche installed at 15 years and one requested abortion (gestational age 7 weeks) at age 19. The patient presents a phenomenon of ischemia of right inferior limb after delivery by cesarean section.

From the family history we mention a diagnosed thrombophilia of the patient's father at the age of 36. He deceased at the age of 56 due to complications of a mediastinal cancer and bilateral thrombophlebitis of the lower limbs that he was diagnosed with.

The medical personal history includes an episode of cavernous sinus thrombosis at the age of 24, following an infection with the varicella virus. The treatment applied was unfractioned heparin for four weeks, continued by low molecular weight heparin therapy for four weeks and oral anticoagulant for one year. During the investigation the patient underwent the tests for hereditary thrombophilia. The result was thrombophilia by polymorphic genes of factor V Leiden and Methylene tetrahydrofolate reductase (C677T), having heterozygous genotype for both genes by probably inherited mutations.

The pregnancy occurs physiologically at 28 years; the patient was for the first time evaluated by the obstetrician at 7 weeks of gestation. Considering the documented thrombophilia and the risks of this condition during pregnancy, a hematology evaluation of the case was required. The pregnancy was established to be with high maternal risk, frequent monitoring being needed. A low molecular weight heparin prophylaxis with daily administration was applied from the beginning of the pregnancy.

At 31 weeks of gestation the patient presents in the emergency room of a city first-degree hospital accusing diminished fetal active movements and the ultrasound exam reveals an intrauterine growth restriction of two weeks and she is guided to the University Emergency Hospital of Bucharest. The same day the patient was hospitalized in the University Emergency Hospital of Bucharest, admitted in the Maternal-Fetal Medicine Unit for investigation and specialist management. Abdominal echography revealed uterine arteries with absent end- diastolic flow, an inversed cerebral-placental Doppler ratio and early and late fetal heart rate decelerations of were registered on cardiotocography. Delivery by emergency cae-

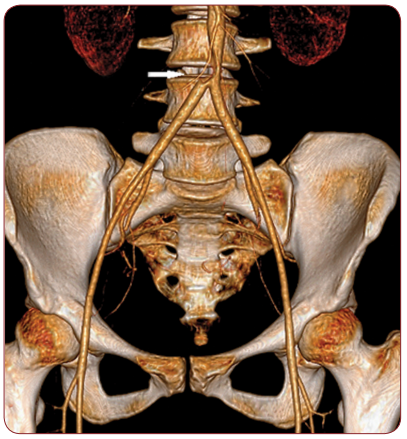
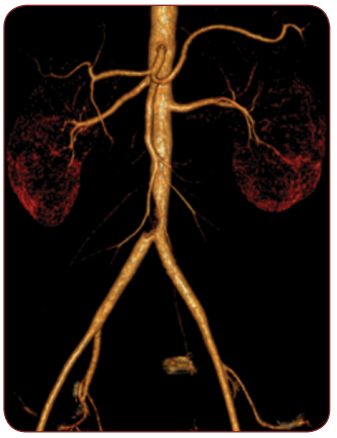

FIGURE 1 and 2. Partial thrombosis of the aortic bifurcation

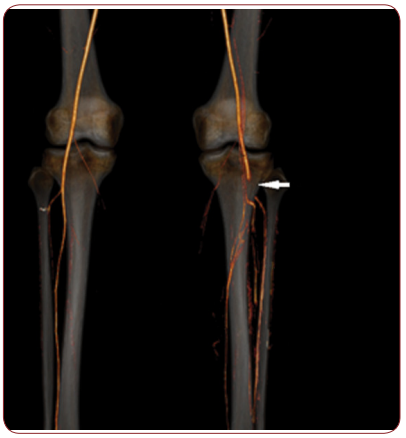
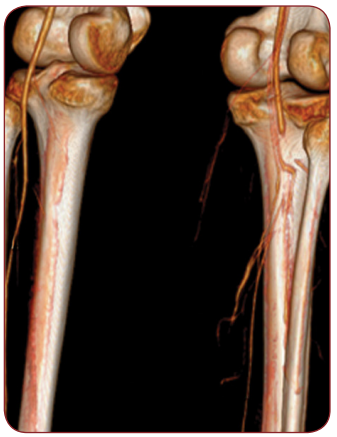

FIGURE 3 and 4. Complete thrombosis of right distal popliteal artery with subsequently loading trunks of the gamba

sarean section was decided and applied considering the decompensated chronic fetal distress. A living masculine fetus that weighted 1000 grams and had an Apgar score 5 at 1 minute was extracted. The newborn was admitted in the neonatal intensive care unit and he had a favorable outcome, with a high capacity for adapting at extra uterine life, no intubation needed.

The post-operatory outcome of the mother was favorable and uneventful within the first 3 days postpartum, under maintained low molecular weight heparin prophylaxis. On the fourth day the patient accuses paresthesia of the right foot without any other symptoms. On clinical exam color modifications together with diminished pulse of the right popliteal artery were observed. The symptoms of the patient together with the clinical signs raised the suspicion of arterial thrombosis of the right limb. An emergency Angio-Computed Tomography was required to confirm the suspected diagnosis. Angio-CT described partial thrombosis of the aortic bifurcation and discontinued flow of the right popliteal artery (Figure 1, 2, 3, 4). For an appropriate monitoring and treatment the patient was transferred to the Cardiovascular Surgery Department of the University Emergency Hospital of Bucharest. The patient underwent a conservatory treatment with heparin in continuous flow for three days, followed by low molecular weight heparin therapy with enoxaparinum 8000ui, anti-Xa/0,8mL administered two times daily for 6 weeks. A weekly consult by a cardiovascular specialist was performed during the following two months after delivery. The recovery was complete and uneventful. ❑

DISCUSSION AND CONCLUSION

Pregnancy represents an individual risk factor for developing arterial or venous thrombosis, representing a hypercoagulable state that affects the coagulation system on one site and the fibrinolytic system on the other (7). Multiple risk factors, like older age, obesity, emergency Caesarean section and frequently acquired and genetic thrombophilias can coexist and reinforce each other. Even if this condition and its risks are in continuous research, arterial and venous thrombosis frequently related with thrombophilia remains a significant cause for maternal morbidity and mortality. Citing several epidemiological facts we mention that eighty percent of thrombotic events occur in veins, and approximately twenty percent occur in arteries. The absolute risk of arterial thrombosis has been estimated to be 4 *per* 10.000 women, within the forms stroke being dominant (8).

Thrombophilia might be the essential pathogenic mechanism of thrombosis in women of childbirth age (9).

Prevention represents the key for a healthy and uneventful pregnancy both for the mother and for the fetus. Observational studies suggested that low-molecular-weight heparin (LMWH) used in adequate doses represents one real possibility to reduce the risk of a thrombotic event and the recurrence of complications of this kind in women with thrombophilia. However, the opinions are divided regarding this fact. Cok et al. (10) studied in 2011 the impact of long term treatment with LMWH on the uterine artery Doppler flow. What he observed was an increased mean of pulsatility index and resistance index in women

with thrombophilia at 18-22 weeks of gestation even if they used LMWH. Villani et al. (11) in their study "Modulation of factors involved in placental haemostasis and angiogenesis by low-molecular-weight heparins" concluded that the administration of LMWH during pregnancy in thrombophilic women restores the relationship between markers of haemostasis and angiogenesis.

It is known that pregnancy is an example of Virchow's triad: hypercoagulability, venous stasis and vascular damage. Maternal consequences of thrombosis of pregnancy include permanent vascular damage, disability and death (12).

Our case represents the classic impact of thrombophilia on the course of a pregnancy, respectively chronic fetal distress and fetal grow restriction culminating with acute fetal distress and the necessity of emergency Caesarean section. The particularity of this case is the impact of the known thrombophilic status on the postpartum period. ❑

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