Should Factor Analysis be a Routine Procedure Prior to Open Heart Surgery? Case Report

Açık Kalp Ameliyatı Öncesi Faktör Analizi Rutin Olarak Yapılmalı mı?

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ABSTRACT A 19-year-old patient who underwent aortic valve replacement and 2 subsequent operations because of bleeding was presented. The patient had no history of bleeding or factors deficiency with normal preoperative hematological parameters. The patient bled about 9000 cc for 3 days in postoperative period. For this reason we investigated the cause of excessive bleeding and detected the factor 7 (FVII) deficiency. Inherited FVII deficiency is a rare coagulopathy. But it should be considered before any major surgery especially; cardiac surgery.

Key Words: Aortic valve insufficiency; aortic valve

ÖZET Bu yazıda, aort kapak replasmanı yapılmış ve bundan sonra da kanama nedeniyle iki kez operasyon geçiren 19 yaşındaki olguyu sunuyoruz. Hastanın kanama hikâyesi veya faktör eksikliği olmayıp, ameliyat öncesi hematolojik parametreleri normaldi. Hastanın operasyonundan sonra drenajının devam etmesi ve 3günde 9000 cc olması nedeniyle yapılan tetkiklerde faktör 7 (FVII) eksikliği tespit edildi. Kalıtsal FVII eksikliği çok nadir görülen pıhtılaşma bozukluğudur. Fakat büyük cerrahiler öncesi özellikle de kalp cerrahisi öncesi akılda tutulmalıdır.

Anahtar Kelimeler: Aort kapak yetmezliği; aort kapak

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The issue of massive hemorrhage following heart surgery has been a focus of cardiac surgeons and anesthesiologists worldwide.[1,2] The incidence of excessive postoperative bleeding in cardiac surgery reaches to 11% according to some authors.[2] A variety of mechanisms interact to create this coagulopathy, including platelet consumption, platelet dysfunction, dilution and consumption of clotting factors, hypothermia, activation of the inflammatory cascade, and fibrinolysis.[3] Cardiopulmonary by pass (CPB) contributes significantly to this process. Many of the factors that predispose to excessive bleeding after cardiac surgery have been identified.[4]

Because of the increasing number of open heart surgeries, it is extremely important to decrease the incidence of postoperative bleeding. It should be kept in mind even in patients whose history and coagulation tests are normal.

Inherited FVII deficiency is a rare autosomal recessive disorder characterized by a wide phenotypic heterogeneity and a very poor correlation between reported procoagulant activity and severity of the bleeding diathesis. Up to now, no conventional clotting assay has ever been found to be predictive of the bleeding tendency in FVII deficiency.[5] In elective open heart surgery cases with FVII deficiency, it is suggested to take the necessary precautions and to minimize the risk for bleeding by administering the factor extract both preoperatively and postoperatively.[6-8]

The unique feature of our case is that; FVII deficiency was not known before, all hematologic and coagulation tests were normal and bleeding stopped before administration of the factor.

CASE REPORT

A 19-year-old man with a history of aortic valve insufiency presented to our institution for valve replacement. His preoperative medical history, clinical examination, coronary angiogram, and laboratory tests did not reveal any other relevant pathology. The patient history was unremarkable regarding any hematological diseases. Before surgery, his international normalized ratio was normal. His remaining coagulation profile and biochemistry data were within normal limits. Heparin 5000 U was administered to achieve an activated clotting time >480s. General anesthesia and intratracheal intubations were done. A standard median sternotomy was performed; CPB was established and aortotomy was done. Macroscopically, all three aortic valve leaflets were thickened but there was no evidence of dilatation of the aortic annulus. The aortic valve was replaced using a 23-mm (St. Jude mechanical prosthetic valve, Boston, USA). The valve was buttressed with mattress sutures and pledgets using 2-0 braided polyester fiber. X-clamp 27 min and CPB 41 min. The patient weaned easily from CPB. Heparin was neutralized with protamin. The sternum was closed with stainless steel wires. No blood products were given during the operation, but there was postoperative bleeding from the drainage tube in our intensive unit. As the patient had about 1000 cc hemorrhagic drainage in the first 3 hours following the operation, he was reoperated. We could not identify a macroscopically source of bleeding. After bleeding control, the wound was closed in a standard fashion. Because of the continuation of the drainage after the second operation , the patients biochemical studies were repeated in the intensive care unit (48 hours after the first operation). The hematological profile was as follows: hemoglobin concentration 7 gm/dl, total leukocyte count 12.500/mm^3 and platelet count 200.000/mm^3. The prothrombin time was prolonged (test sample 60.1 sec, control 9.2 sec) but the partial thromboplastin time was normal (test sample 33 sec, control 27 sec). Bleeding could not be controlled despite administration of 10 U of blood, 15 U of platelets, 26 U of fresh frozen plasma and we performed a second reoperation but again we could not identify a surgical source of bleeding. Mediastene was packed with surgicele and the tissues were closed accordingly**.** At the same time, following consultation with the hematology department, we sent blood samples to determine blood coagulation factors levels. The patient was transported to the intensive care unit where his bleeding slowed to, and remained, <100 mL/h after the third operation. The factor levels (Organon Tecnica Coagulometry, Stago Neoplastine) which could be obtained only after 48 hours revealed a severe FVII deficiency and at that time the patient's drainage had already stopped eliminating the need for factor replacement. When bleeding stopped, the patient had a total of 9000 cc drainage. 20 U erythrocyte suspensions were given to the patient while he was in the ICU. He was endotracheally extubated 2 days later and progressed well until being discharged from hospital on 9th day.

DISCUSSION

Inherited factor VII deficiency is a rare coagulopathy. In India the reported incidence is 1% and very few cases have been reported to date.[5] Bleeding postcardiac surgery remains a significant problem with a surgical reexploration rate of 2%-6%.[1,2] Among these although factor VII deficiency is a rare disorder, it can potentially cause serious complications.[8] To the authors knowled-

ge, the number of cases having FVII deficiency who underwent open heart surgery is very limited.[6-11]

In all reports in the literature, precautions were taken before surgery as FVII deficiency was known before. Our case was operated without being aware of the factor deficiency and had a great amount of drainage. The drainage was controlled after the third operation. Like this case that has unknown factor deficiency, the diagnosis should be made certain and then started the therapy before operation. Because the time for getting ready of the deficient factor can be delayed. It is important to note that; we were able to control the bleeding, using great amount of fresh frozen plasma, aprotinin, epsilon-aminocaproic acide[4] and surgicel and without using the factor extract.

Although the incidence of factor deficiency is low, increasing number of open heart operations increase the risk of facing the patients with this disorder. Early recognition of this condition and proper replacement of factor is extremely important to prevent hazardous complications. We concluded that, even though these studies are expensive, to decrease both morbidity and mortality, the becoming cheaper of factor analyzing and being routine will make the surgeons also heart surgeons more comfortable.

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