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INTRACARDIAC THROMBUS AND RECURRENT DIABETIC KETOACIDOSIS, CASE REPORT

İNTRAKARDİYAK TROMBÜS VE TEKRAR EDEN DİYABETİK KETOASİDOZ, VAKA RAPORU

Arif YÜKSEL[1] Abdi SAGCAN[2] Suat BUKET[3]

[1]University of Health Sciences, Izmir Bozyaka Health Research and Application Center, Department of Internal Medicine, Izmir/Turkey
[2]Medicana Hospital, Department of Cardiology, Affiliation of KARATAY UNIVERSITY
[3]Medicana Hospital, Department of Cardiovascular Surgery, Izmir/Turkey

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SUMMARY

Introduction: *Diabetic ketoacidosis is an acute, serious ,and life-threatening diabetes characterized by hyperglycemia, ketoacidosis, and ketonuria This happens when an absolute or relative insulin deficiency prevents the glucose entry into cells for use as a metabolic fuel, such as a result of which the liver rapidly breaks down fats into ketones that can be used as a fuel source. Factor V Leiden is a mutation of one of the blood clotting factors. This mutation can increase your chances of developing abnormal blood clots.*

Case: *A 58-year-old married woman years she was hospitalized 3 times in the last 6 months with diabetic ketoacidosis. In addition, during her last hospitalization, we revealed intracardiac thrombosis that she had not been diagnosed before.*

Conclution: *We decided to report a case that will be valuable to the literature in a patient because it combines the intracardiac mass (atrial thrombus right) and Factor V Leiden deficiency.*

ÖZ

Giriş: *Diyabetik ketoasidoz, hiperglisemi, ketoasidoz ve ketonüri ile karakterize diyabetin akut, ciddi ve yaşamı tehdit eden bir hastalığıdır. Yağları, yakıt kaynağı olarak kullanılabilecek ketonlara ayırır. Faktör V Leiden, kan pıhtılaşma faktörlerinden birinin mutasyonudur. Bu mutasyon, anormal kan pıhtıları geliştirme şansınızı artırabilir.*

Olgu: *58 yaşında evli kadın, son 6 ayda 3 kez diyabetik ketoasidoz nedeniyle hastaneye kaldırıldı. Ayrıca son hastanede yatışında, daha önce teşhis edilmemiş intrakardiyak tromboz olduğunu ortaya çıkardık.*

Sonuç: *Bir hastada intrakardiyak kitle (sağda atriyal trombüs) ve Faktör V Leiden eksikliğini birleştirdiği için literatüre değer katacak bir olguyu sunmaya karar verdik.*

INTRODUCTION

Diabetic ketoacidosis (DKA) is a life-threatening complication of diabetes mellitus (DM) which mainly occurs in patients with type 1 DM, but also not uncommon in patients with type 2 DM. DKA is a state of absolute or relative insulin deficiency potentiated by glucose counter-regulatory hormones excessiveness. The most common precipitating factors of DKA are infection, acute medical conditions (such as stroke, pancreatitis and acute coronary syndrome) and new onset of DM. DKA occurs as a result of metabolic acidosis triad including hyperglycemia, ketonemia and lack of anions (1).

DKA is a serious and rare health issue which can be a life threating complication of diabetes.DKA is known as potential cause of severe dehydration, high serum viscosity and thrombosis secondary to low cardiac output. DM, in some cases, can increase the risk of thrombosis with some defects in the coagulation and fibrinolytic system (2,3). The thrombosis risk of patients with DM was shown in some studies with increased level of the level of hemostatic factors which can increase the activation and adhesion of platelets, as well as by triggering the level of plasminogen activator inhibitor-1 and disrupting fibrinolysis. Patients with DKA both increased the level of coagulation factors and deteriorated endothelial integrity with hyperviscosity in the endothelial cells are two possible condition in patients with DKA which occur mainly as a result of oxidative stress. Intracardiac thrombosis (ICT) is mostly caused by atrial fibrillation, catheter, lead/line related thrombus, advanced heart failure, acute myocardial infarction or mobile thrombus and venous thromboembolism. Faktor V Leiden mutation is one the causes of ICT and its mechanism of action is not well known. The cases diagnosed with ICT that we found in medical bibliography are reported as follows: 15 patients with lack of protein C and S, 6 patients with Factor V Leiden (4,5). These cases (interatrial bulks) usually have been diagnosed based on doing multi-mode imaging techniques with computed tomography (CT) and also have been pathologically examined. With this study, we report a case diagnosed with ICT and recurrent DKA (6).

CASE

The patient was a 58-year-old married woman with nulliparity. Taking history of patient, we recorded that she was diagnosed with type 2 DM for about 20 years ago and 3 times in 6 months she was hospitalized with DKA. She had also a history of 3 times spontaneous abortion until 30 years ago. In her family history, we also recorded that her mother and aunt have had type II DM. After diagnosed with type 2 DM, beside a diabetic diet and regular exercise, she was prescribed with Glimepiride 2 mg (1x1 daily) and Metformin 1000 mg (2x1 Daily). About 5 years ago, the patient was adviced to start intensive insulin therapy because of her poor glycemic control and persistent the higher level of HBA1C over 10%, but she had rejected to use insulin therapy all the time.Therefore, all DM therapy was changed as gliclazide 60 mg 1X1 daily, metformin 1000 mg daily2x1, vildagliptin 50 mg 2x1 daily. After this uncontrolled blood glucose period of time, she was admitted to hospital for 6 months ago for DKA and her HBA1C was 11%. During her first hospitalizaiton for DKA, she changed his mind and accepted insulin therapy, then she was prescribed with aspart insulin and insulin glargine. After 2 months later she was charged in hospital for the second time for DKA and her HBA1C was 14.2%. We did not find any reason for her DKA other than poor glycemic control and insulin dose deficiency, then so we was able to dischage her 5 days later by revising insulin therapy (Insulin aspart and Insulin U300, lifestyle change recommendations). The patient was admitted to our university's internal diseases clinic due to her 3. and last diagnosis of DKA. She was charged in hospital with symptoms of mild cognitive impairment, sleep tendency, vomiting and stomach pain. During physical examination, we saved findings as followings: Fever: 37.6°C, arterial blood pressure: 90/55 mmHg, pulse rate: 108/min and respiratory rate 22/min. The moist and pale skin and dry tongue were noticed and extremity artery pulse palpation and filiform were taken during systematic examination. In addition, physical examination findings, circulatory system, respiratory system and abdominal examination were normal. There was a tendency to nausea and sleep, but he was awake and his response to stimuli was normal.

Laboratory Findings

Laboratory results were as follows: Glucose: 650 mg/dL, hemoglobin: 12.5 gr/dl, hematocrit: 39%, pH: 7.23, HCO3: 13.8 meq/l, pCO2: 27 mmHg, BUN 14 mg/dl, triglyceride: 160 mg/dl, HBA1C: 14.5%, ferritin: 40 ng/ml, creatinine: 1.1 mg/dl, Na: 135 meq/l, Crp: 3, lactic acid: 2 mmol/l, K:5.4 meq/l. In urine, ketone and protein were 3+ and 1+, respectively. DKA was diagnosed with clinical presentation and laboratory results (ketonemia 3 mmol/L or ketonuria +3, blood glucose > 11 mmol/L or known DM and HCO3< 1mmo/L). Her body mass index was 32 kg/m2. The case was a patient with metabolic acidosis due to DM.

After we discharged the patient, we have never diagnosed any neuropathy, but revealed retinopathy and proteinuria (1152 mg/24h). The cardiologist reported the transesophageal echocardiography as ‘’the bulk that reaches to right atrium from tricuspid valve was observed (confusing findings: intracardiac tumor or myxoma)’’, (Fig. 1). After the suspicious mass in the right atrium was reported on the transesophageal echocardiography, cardiovascular surgeons performed an operation and stated that the intraoperative mass was a smooth shaped mass with a hard rubber consistency and did not macroscopically resembles the traditional myxoma nature (Fig. 2). Excised mass macroscopically looked like hard fibrin-coated thrombosis. Although, after pathological observations were performed, the pathologists stated that the bulk was fibrinoid-coated thrombosis (Fig. 3). When the patient was reassessed, we had a new information about the patient’s history of abortion 3 times before which had not been never shared with us. Then we focus on what was the real reason of ICT, which one would be the main reason: DKA or hemostatic factors or combined of distinctive pathological pathways. After we consulted patient with hematologists and rheumatologists for differential diagnoses to reveal the causes of both chronic thromboembolic events and miscarriages such as coagulation disorders or vasculitis, we revealed that patient had have an activated FVL mutation. Therefore INR was targeted between 2.5-3 and warfarin (7.5 mg / Daily) prophylaxis was applied to the patient clinic. During 1-year follow-up, her metabolic parameters including blood glucose and INR were at the desired level and DKA had not been recurred again.

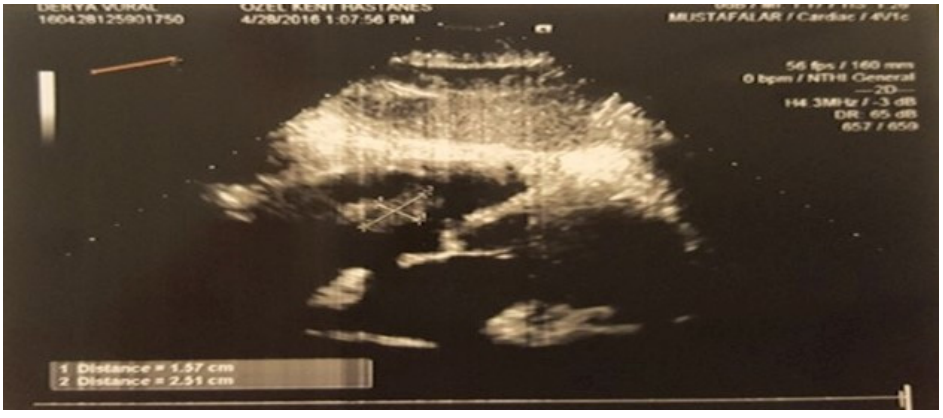

Figure 1. Intracardiac mass appearance on transesophageal echocardiography

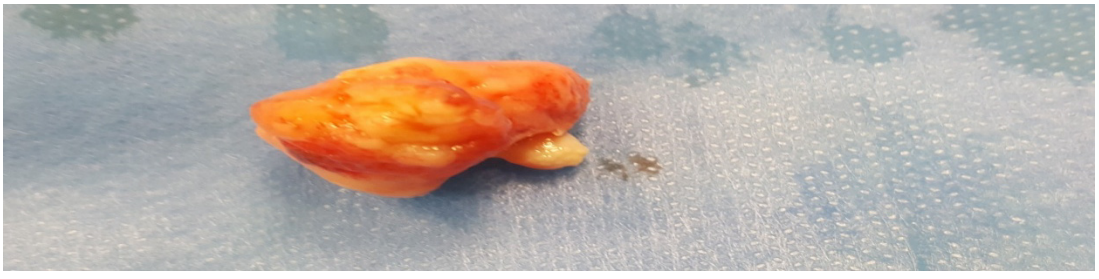

Figure 2. Appearance of per-operative-intracardiac mass (thrombus)

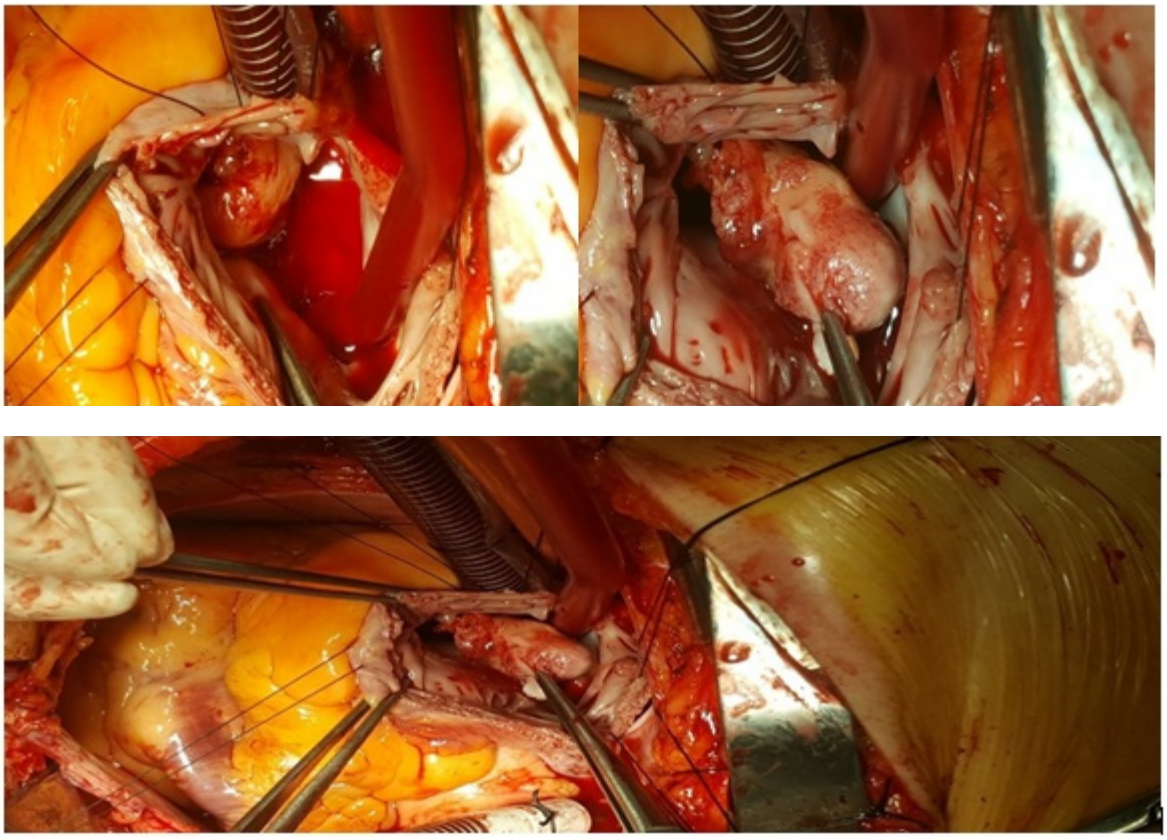

Figure 3. Postoperative intracardiac mass (surgical material sent for pathological examination, thrombus)

DISCUSSION

DKA alone could be a cause of thrombosis in our case, but the patient was also diagnosed with Factor V Leiden (FVL). Case series with ICT due to FVL have been described before whereas there are also various cases of thrombosis due to DKA. We know that type II DM patients are more prone to thrombotic events compared to non-diabetic controls (6). In another study, Alzahrani et al. associated an increase in the activation of prothrombotic coagulation factors and decreased fibrinolysis with platelet hyper-reactivity in diabetic patients (7). Cases of ICT due to FVL alone are available in the medical bibliography, and the physiopathological pathway causing ICT has been adequately demonstrated (4,5). But in the medical bibliography, we could not find a case similar to our case, both together with DKA and an ICT. As we know that the mechanisms underlying the increased risk of thrombosis in DM are complex and multifactorial, the subjects with DM have a predisposition to the formation of thrombosis and early atherosclerosis (8). Prothrombotic status is characterized by increased fibrinogen levels, increased plasminogen activator inhibitor-1, and different abnormalities in platelet function (9,10). In our case just alone with DM, it was not a lower posibility to expect a tendency to thrombosis. ICT and FVL might be the another reason which could play a role in the ketoacidosis with patient's 3 times hospitalization in the last 6 months. Not only the patient was undergone a successful cardiac surgery and recovered fast, but also in the following year there has not been another hospitalization because of DKA and also for other reasons any more.

As authors, we criticised the possible scenarios for our case as follows: Fist scenario was that the thrombus and FVL without prophylaxis could cause poor glycemic regulation which also could have been a cause for DKA or DKA and poor glycemic control which could cause thrombosis might be the two causes of the second scenario .

The case was like the chicken or the egg causality dilemma. In our opinion, as result of those interventions including the excising thrombosis mass in atrium by cardiovascular surgery and commencing an anticoagulant prophylaxis for FVL, DKA have not never happened again and the desired glycemic goals were achieved easily. As a result of this positive progression in glucose control of the case after surgery we have been with the idea that the cause of poor glycemic control and DKA might be a consequence of ICT as like in first scenario. But on the other hand, there is still a possibility of second scenario because we can not guarantee that in the future the case will not have another ICT because of unregulated blood glucose levels again.

CONCLUSION

A doctor must always bear in mind that ICT can be a cause or a result of unregulated blood glucose levels or recurrent DKA in a patient's clinic which need a multidisciplinary care and a comprehensive approach to diagnose and treat.

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Corresponding Author

Abdi SAGCAN (Assoc. Prof.)
Medicana Hospital, Department of Cardiology, Affiliation of Karatay University
Phone: 0 232 970 35 35
Fax: 0850 460 6334
E-mail: abdisagcan@gmail.com
ORCID: 0000-0002-1441-3653

Arif YÜKSEL, (Prof. MD, Ph.D) ORCID: 0000-0002-8568-5787
Suat BUKET (Prof. MD) ORCID: 0000-0002-8038-0722