SAYI 3
CILT 1

THROMBOSIS OF THE UMBILICAL CORD VEIN: AN UNRESOLVED DILEMMA, CAUSE OR EFFECT OF FETAL DEMISE?

UMBLİKAL KORD TROMBOZU: ÇÖZÜLMEMİŞ İKİLEM; FETAL ÖLÜMÜN SEBEBİ Mİ YOKSA SONUCU MU?

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ABSTRACT

Thrombosis of fetal umbilical cord (UC) vessels is a rare event and presumably affects 1/1300 of all fetal necropsies, 1/1000perinatal postmortems, 1/250 fetal autopsies of high risk pregnancies, 1/25 of fetal autopsies with cord abnormalities.. Even though, UC vessel trombosis is a major concern for late fetal distress and intrauterine demise, the casual mechanisms and related effects of thrombosis are not well understood. Umbilical cord thrombosis is not listed among factors associated with fetal death since its direct impact cannot be revealed. Despite a common pathologist-obstetrician intuition about a thrombus in the UC, concurrent maternal and/or fetal conditions prevent its acceptance as an independent factor. A patient with normal gestational follow-up findings presenting with fetal death in utero at 38 weeks' gestation, whose post-mortem pathologic fetal investigation revealed thrombosis of the umbilical vein will be presented together with the review of literature.

Key Words: Thrombosis, umbilical cord, late fetal death

ÖZET

Fetal umblikal kord damarlarının trombozu nadir bir durum olup, fetal nekropsilerde 1/1300, perinatal postmortemlerde 1/1000, yüksek riskli gebeliklerin fetal otopsilerinde 1/250 ve kord anomalili fetüslerin otopsilerinde 1/25 oranında rastlanmaktadır. Umblikal kord damar trombozu geç fetal stres ve fetal ölüm açısından endişe nedeni olsa da, tromboz ilişkili etkiler ve olası etki mekanizması tam anlaşılamamıştır. Direkt fetal ölüm ile ilişkisi ortaya çıkarılamadığından dolayı, umblikal kord trombozu fetal ölüm ile ilişkili faktörler listesinde yer almaz. Patolog ve obstetrisyenler arasında umblikal kord trombozu hakkında sezgisel bir fikir varsa da eşlik eden maternal ve fetal durumlar nedeniyle bağımsız bir faktör olarak kabul görmemektedir. Gebeliğin 38.haftasında intrauterin fetal ölüm tespit edilen, gebelik takibinde özellik bulunmayan, fetüsün postmortem patolojik incelemesinde fetal umblikal vende tromboz saptanan olgu nedeniyle ani fetal ölüm ile umblikal kord trombozu arasındaki ilişkiyi literatür eşliğinde sunuldu.

Anahtar Kelimeler: *Tromboz, umblikal kord, geç fetal ölüm*

Introduction

Thrombosis in fetal umbilical cord vessels is a rarely seen condition. It is stated that it is seen at a rate of 1/1300 in the retrospective autopsyresults, 1/1000 in perinatal autopsies, 1/250 in risky gestations and 1/25 only in the cases on whom cord anomalies are examined. It was monitored that there was venous thrombosis in 70 % of the Cases determined to have had cord thrombosis, both arterial and venous thrombosis in 20% of them and only arterial thrombosis in 10% of them. Separately, it is reported that arterial thrombosis is associated with unfavourable fetal consequences and mortality more frequently when compared with venous Thrombosis (1,2). It is pointed out that cord thromboses do not cause a spontaneous abortus in the early gestational weeks, however, they result in fetal stres and fetal loss in the late gestational weeks. Since the cause-effect relationship cannot be clearly put forward, this cannot be considered among the causes of fetal death. Eventhough both a pathologist and a clinician may doubt that Thrombosis may be the cause of fetal death, the maternal and/or fetal factors generally accompanying in such patients lead to the fact that cord thrombosis as the single factor cannot be regarded as the cause.

We have thought of presenting, in company with the literature, the relationship between sudden fetal death and umbilical cord Thrombosis dueto the case determined to have had thrombosis in the fetal umbilical vein in the postmortem pathological examination of the fetus during the 38th gestational week of the patient who applied to the clinic with sudden fetal death case, without any clinical feature in the gestational follow-up.

Case Report

The patient A.B. is a 26 year old woman in her 3rd pregnancy, with an obstetrical history of two previous pregnancies terminated by cesarean section (CS). The second baby died of congenital heart disease at 20 days of age during the neonatal period. At the time of her first visit, 28 weeks' gestation,fetal measurements were found 3 weeks ahead of normal. Except normal oral glucose tolerance test (OGTT), no other prenatal test results were available. At her next visit, 37 weeks' gestation, ultrasonographic fetal biometry showed macrosomy compatible with 39-40 weeks with mild polyhydramnios. Fasting blood glucose level of 114mg/dl, rouse the suspicion of an impaired glucose tolerance. An elective CS was planned at 38 weeks' gestation. At her admission to our clinic for the operation no fetal heart sounds could be detected; a 4300gr stillborn baby boy was delivered by CS. Having consent of the mother, the fetus and placental tissues were sent to Pathology Department for histopathologic examination. The patient's follow-up showed no abnormalities during her stay. Her post-op 2 months follow-up was also normal; HbA1c value of %5.2 and a normal OGTT performed with 75gr of glucose. Coagulation tests had no significance.

Pathologic investigation revealed following on the fetus: 1) Fetus with male genitalia at 36-37 weeks' maturation according foot length and at 42 weeks' maturation according to other body compartments showing signs of intrauterine exitus (maceration of the skin and diffuse autolytic findings on the body) 2) A body weight measured 4150 gr before the autopsy represents macrosomy for both ages of maturation 3) Diffuse autolytic findings as a consequence of intrauterine exitus observed in all the organs, namely the brain, liver and kidneys. Thymus and the submandibular gland were the least autolytic organs.

The placenta was consistent with the gestational age (ie. third trimester). The fetal side was smeared with meconium. Non-organized thrombus formation in the umbilical vein was the most remarkable feature (Figure 1).

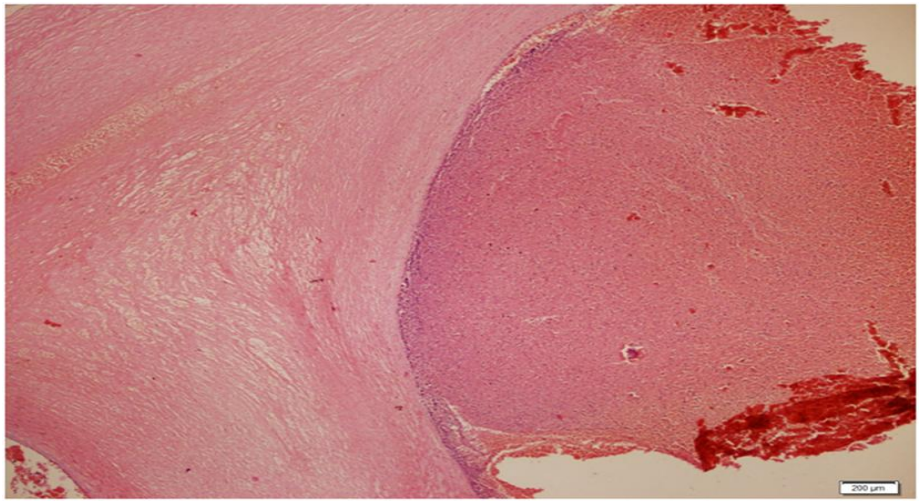

Figure 1: Microscopic section of the umbilical cord showing fresh occlusive thrombus formation with adherence to the intima (Hematoxylin and eosin x100).

Discussion

Rate of fetal death is approximately 1 in 200 deliveries. The rate and its ethiology is greatly variable in different countries, even among different regions of the same country (3). Intrauterine fetal death still has a major contribution to perinatal mortality rates especially in developing countries. Despite an increase in detection of factorsin the etiology of fetal death a specific reason might not always be identified (4). Fetal deaths with unknown constitute 12-50% of all fetal deaths in literature (3,5). Late fetal deaths might occur as a consequence of fetal, placental or maternal disorders. However, 10% of late fetal deaths are considered as"idiopathic fetal loss" regardless of advances in obstetric, clinic, genetic, feto-maternal medicine and perinatal pathology. 25-40% of late fetal deaths are caused by fetal disorders such as anomalies, infections, malnutrition, immune and non-immune hydrops (6). Placental, membranous and cord associated late fetal deaths are approximately 15-25% of all; most of these factors might also be considered as maternal similar to maternal hypertension. Maternal factors contribute to a minority of late fetal deaths, of which 5-8% are caused by maternal diabetes and hypertension (5,7). It's hard to certainly declare the rate of UC thrombosis among placental, membranous and cord associated deaths. Thrombosis of the UC is a rare event. Its incidence is presumably 1/1300 retrospective autopsies, 1/1000 perinatal autopsies, 1/250 fetal autopsies of high risk pregnancies and 1/25 fetal autopsies with cord abnormalities. It's reported more frequently in male foetuses (1). UC thrombosis is often associated with a high perinatal morbidity and mortality. Ininstances of UC thrombosis accompanied by other gestational complications such as preeclampsia the direct relationship of thrombosis with the fetal death cannot be revealed. Moreover, establishing a common language between the clinician and the pathologist might be challenging. Distinction between a pre- and post-mortem thrombus might also pose a challenge.

The Wirchow Triad consisting of stasis, hypercoagulability and endothelial dysfunction plays a major role in thrombus formation. Stasis may proceed from a long cord, torsion or a true knot of the UC.[1]Paternal or de novo hypercoagulability cases are reported without any maternal liability to thrombosis (1,8). Endothelial dysfunction in the umbilical vessels might be seen secondary to maternal or fetal infections and diabetes (1). In 70% of the thrombotic vessels the reason was solely venous, in 10% arterial and the combination of both was responsible from 20% of the cases. Moreover, arterial thrombosis alone is more often linked to fetal distress and mortality than its venous counterpart (1).The association of venous thrombosis and sudden fetal death in our case is interesting; similar cases are extremely rare in literature. Various mechanisms of diabetes have been shown leading to intrauterine fetal death in literature. Probable pathophysiological pathways of pregestational diabetes in particular causing sudden fetal death have been identified. Chronic intrauterine hypoxia secondary to extramedullary hematopoiesis, diabetic vasculopathy, hypertrophic cardiomyopathy and degradation of myocardial performance are some examples (9,10). In some studies gestational diabetes has been shown to affect myocardial function and anatomy in a similar fashion to pregestational diabetes (10).In our case, the main event that led to sudden fetal death is thought to be the UC thrombosis secondary to glucose intolerance.

In conclusion, since no probable maternal or fetal causes responsible from antenatal thrombosis have been identified, impaired glucose tolerance was thought to be the main reason regarding fetal macrosomia, polyhydramnios and a high fasting glucose. Our aim in presenting this case was to draw attention to the significance of UC thrombosis in the ethiopathogenesis of glucose metabolism disorders and that venous thrombosis, a rare cause regarding previous data, might have caused fetal death in our case despite unproven causation.

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Conflict of interest statement

The authors declare no conflict of interest.