Retrospective Investigation of Transverse Situs Single Pregnancy Cases Without Placenta Previa

Plasenta Previa'nin Eşlik Etmediği Transvers Situs Tek Gebelik Olgularının Retrospektif İncelenmesi

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ABSTRACT

Objective of this study was to retrospectively evaluate the possible etiologic factors of transverse situs cases not accompanied by multiple pregnancies and placenta previa and postpartum fetal outcomes.

113 patients delivered under the diagnosis of transverse situs not accompanied by multiple pregnancies or placenta previa were included in the study. Demographic characteristics of these patients, possible transverse situs etiologies and postpartum maternal and fetal outcomes were evaluated using descriptive statistical analyses.

Transverse situs rate of 61594 patients who delivered between 2011-2015, was 0,183 % (113/61594). 52.2% (59/113) of patients were ≥3 gravida, 7% (8/113) had uterine anomalies, 7.9% (9/113) had myoma uteri and 6.2% (7/113) had fetal anomalies. 64 fetuses (56.6%) were in dorsosuperior position (Group 1), while 49 patients (43.4%) in dorsoinferior position (Group 2). Operation time was significantly longer in Group 1. There was a statistically significant difference between the two groups in terms of uterine artery injury, and pre- and postoperative hemoglobin differences (Delta hemoglobin) levels.

BMI ≥25 kg/m^2 and gravida ≥3 were found as significant etiologic factors in addition to factors affecting the uterine volume. Furthermore, we also found that prolonged operation time and increased delta Hb rates were detected in dorsoinferior transverse situs cases.

Keywords: Transverse Situs, Cesarean Section, Malpresentation

ÖZ

Çoğul gebelikler ve plasenta previa'nın eşlik etmediği transvers situs olgularının, olası etiyolojik nedenlerinin, maternal ve fetal postpartum sonuçlarının değerlendirilmesidir.

2011 Ocak-2015 Aralık tarihlerinde hastanemizde doğum yapan olgular retrospektif olarak incelendi. Çoğul gebelik ve plasenta previa'nın eşlik etmediği 113 transvers situs tanısıyla doğum yapan hasta çalışmaya dahil edildi. Hastaların demografik özellikleri, etiyolojileri ve postpartum maternal ve fetal sonuçları incelendi.

Doğum yapan toplam 61594 hastanın transvers situs oranı %0,183 (113/61594)'tür. Transvers situs muhtemel etiyolojileri %52,2 (59/113), ≥3 gravida, %7 (8/113) uterin anomali, %7.9 (9/113) myoma uteri ve %6.2 (7/113) fetal anomali olarak belirlendi.64 (%56.6) fetüsün dorsosuperior (Grup 1), 49 (%43.4) hastanın ise dorsoinferior pozisyonda olduğu saptandı (Grup 2). Operasyon süresi Grup 1 de istatistiksel olarak anlamlı şekilde daha uzun saptandı. Uterin arter yaralanması ve operasyon öncesi ve sonrası hemoglobin farkları (Delta hemoglobin) seviyeleri arası istatistiksel olarak anlamlı fark mevcuttu.

Transvers situs etiyolojisinde uterin hacmi etkileyen faktörlere ek olarak BMI'in ≥25 kg/m^2 ve gravidanın ≥3 olması etiyolojik faktör olarak belirlendi ve dorsoinferior transvers situs olgularında uzamış operasyon süresi ve artış delta Hb oranları saptandı.

Anahtar Kelimeler: Transvers Geliş, Sezaryen Doğum, Malprezentasyon

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INTRODUCTION

Transverse situs means the fetal placement with the longitudinal axis perpendicular to longer axis of the uterus. Although it is frequent in the earlier stages of pregnancy, it is seen one in every 300 deliveries.[1] It is the most risky malpresentation type as regards the neonatal and maternal complications among the fetal malpresentations.[2] Leopold maneuver can be helpful, but its sensitivity is 70% .[3] Ultrasound is very useful for both making the diagnosis and determining the etiology. Use of ultrasound can eliminate the false positivity of abdominal palpation techniques.[4] Like in all malpresentation types, early diagnosis is beneficial also in transverse situs. While the fetal loss risk is 9.2% in early diagnosis, the same is 27.5% in late diagnosis. Early diagnosis improves the fetal outcomes. Fetal presentation was studied in three periods throughout the course of the pregnancy. The first period is the period up to the week 24 that the fetal position and situs change gradually in steps. Cephalic presentation increases gradually within the second trimester between the weeks 24 and 35. Fetal position will not change in general within the third trimester following the initial thirty-five weeks, or cephalic presentation rate will increase slightly.[5,6] In the early stages of pregnancy, fetus is less compressed because of the relatively higher amniotic fluid volume as compared to the fetal volume, and the fetus assumes non-cephalic position in general. Most of the fetuses in transverse situs within the early weeks of pregnancy will assume cephalic or breech presentation in the advancing weeks of pregnancy.[7,8] It has been reported that maternal positions during the course of pregnancy can affect the fetal positions such as increases in the frequency of non-cephalic presentations in paraplegic and tetraplegic mothers who spend their time in horizontal position or lack of change in fetal positions in mothers who exercise by swimming in the third trimester.[9,10] Prematurity is the most common risk factor for transverse presentation. Other risk factors include high numbers of parity, placenta previa, narrow pelvic structure, uterine anomalies and masses, polyhydramnios, fetal anomalies and multiple pregnancies.[1,11] However, transverse presentation occurs without these risk factors most of the time.

Insufficiency of imaging methods, emergency caesarean section and neonatal intensive care possibilities in developing countries create risks for maternal and fetal mortality and morbidity rates in relation with transverse presentation.[12] Perinatal mortality rates in transverse situs ranges between 3.9% and 24%, and maternal mortality can reach 10%. Maternal mortality is frequency the result of infections following premature membrane rupture, bleeding as a result of abnormal presentation and complications of traumatic delivery operations. The most frequent causes of fetal mortality are traumatic labor and cord prolapse. Twenty times more frequent cord prolapse was observed in transverse situs as compared to the cephalic presentation. Although modern screening methods can lower these mortality and morbidity rates, they can never be as low as those in cephalic or breech presentations.[13]

In our study we aimed the retrospective evaluation of possible etiologic factors in transverse situs cases not accompanied by multiple pregnancies or placenta previa and maternal and fetal postpartum outcomes and to determine the difference between these results according to the fetal spine position.

MATERIALS AND METHOD

Of these registries, primary cesarean section, preterm or term and low risk 113 patients with only transverse situs for caesarean section indication were included in the study. Patients who delivered by cesarean section with indications that already known to be involved in the etiology of transverse situs such as placenta previa and multiple pregnancy were excluded from the study.

Pfannenstiel incision was used as the skin incision of patients, continued with segmental transverse section for the uterine incision.

Demographic characteristics of these patients were evaluated using the possible transverse situs etiologies, and postpartum maternal and fetal outcomes.

Furthermore, patients were assigned to two groups based on the position of the fetal spine, namely the "dorsoinferior group" (Group 1) where the fetal spine was positioned lower at the cervical part, and the "dorsosuperior group" (Group 2), where the back of the fetus was positioned higher; and the two groups were compared as regards the operation times, delta hemoglobin (preoperative hemoglobin – postoperative hemoglobin difference), uterine artery injury, need for admission to the neonatal intensive care unit (NICU), postpartum uterine atony and transfusion need. $p<0.05$ value was accepted as the level of statistical significance.

Data were analyzed using IBM SPSS V23. Kruskal Wallis and Mann Whitney U test was used for the comparison of data without normal distribution. Chi-square test was used in the analysis of the distribution of qualitative data based on groups. While the results of analyses were presented in median (min-max) were quantitative data, the same for presented as frequency (percentage) for qualitative data. Level of significance was accepted as $p<0.05$.

Ethical Aspect of Research

Cases who had delivered in our hospital within the 4-year period between January 2011 and December 2015 were investigated retrospectively. Approval of the ethical committee of our hospital was obtained for our study (Etlik Zubeyde Hanım Education and Research Hospital Local Ethical Committee Date: 21 January 2019 Approval Number: 90057706-799) and Our study was conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS AND DISCUSSION

Between these dates, 61594 deliveries were carried out in our hospital. Among these deliveries, the rate of cases not accompanied by placenta previa or multiple pregnancies is 0.17% (113/61594).

The mean age of our patients was 29.7 ± 6.3, and there were 15 patients (30%) ≥35 years of age. The mean BMI of patients was 29.7 ± 5.3 kg/m2, and 82% of patients had BMI ≥25 kg/m2.

Distribution of patients based on the week of pregnancy was found as 24% (12/50) and 76% (38/50) for weeks <37 and ≥37, respectively. Demographic characteristics of patients included in the study are given in (Table 1) in detail.

Table 1. Demographic Characteristics of Patients

Variables (n=113)	Mean. ± S.D.	(Min-Max)
Age (years)	29.6±6.2	(17-42)
BMI (kg / m2)	29.6 ±5.2	(20.7-44.1)
Gestational week	37.1±4.3	(26-41)
Gravida	2.9±1.7	(1-7)

Considering the probable etiologies for transverse situs, it was seen that 52% (26/50) of patients were ≥3 gravida, 6% (3/50) had uterine anomalies, 8% (4/50) had myoma uteri and 6% (3/50) had fetal anomalies (Table 2).

Table 2. Possible Etiologic Factors

Possible etiologic factors	Ratios
Gravida (≥3)	%52.2 (59/113)
Prematurity (<37 weeks)	%21.2 (24/113)
Uterine anomaly	%7 (8/113)
Myoma Uteri	%7.9 (9/113)
Polyhydramnios (≥200mm)	%5.3 (6/113)
Fetal anomaly	%6.2 (7/113)

Deliveries of all the cases included in the study were carried out through caesarean section (100%). Evaluation of postpartum maternal outcomes showed that there were two uterine atonia cases, out of which one created transfusion need. Fetal outcomes showed that 16.3% (8/49) needed care in neonatal intensive care unit, there was one intrapartum fetal loss, and 12% (6/50) of neonatal fetuses had complications (Table 3).

Table 3. Overall Postpartum Maternal and Fetal Outcomes

Maternal Results	
Preoperative Hb (gr / dl)	12.1±1.5 (9.6-15.1)
Postoperative Hb (gr / dl)	10.6±1.7 (7.6-13.4)
Uterine Atony	%1.77 (2/113)
Need for Transfusion	%0.88 (1/113)
Neonatal Results	
Birth weight (gr)	2993.8±1026.7 (580-4740)
Need of neonatal intensive care unit (NICU)	%16.9 (19/112) *
Neonatal complication	%12.3 (14/113)
Respiratory Distress Syndrome (RDS)	%7.9 (9/113)
Bronchopulmonary Dysplasia (BPD)	%2.6 (3/113)
Respiratory Distress Syndrome (RDS)+ Premature Retinopathy + Patent Foramen Ovale	%1.77 (2/113)
APGAR score (<7)	%10.6 (12/113)

When patients included in the study were divided in groups based on the fetal spine, 64 (56.6%) fetuses were in dorsoinferior position (Group 1), and 49 (43.4%) were in dorsosuperior position (Group 2). Inter-group comparison of operation times showed that the same were 73 ± 14 (54 – 112) and 59 ± 18 (46 – 95) with statistically significant differences between the groups. (p<0,001). Uterine artery injury was observed in 7 (10.9%) patients in Group 1 and 2 (4.1%) patients in Group 2, and there was a statistically significant difference between the two groups.(p=0.04) In comparison of preoperative and postoperative hemoglobin differences (delta hemoglobin), the same were found as 1.8 ± 0 and 1.4 ± 0.4, and there was statistically significant difference between the groups (p=0.02). There was no statistically significant difference between the groups according to uterine atony, need for transfusion, preterm birth (<37 weeks) and need of neonatal intensive care unit (nicu) (p>0.005) (Table 4).

Primary caesarean indications include transverse situs with a rate of 1.3%[14]. Transverse lie may be detected in early labor with the membranes intact when the prognosis is very good for the mother and the fetus. Ultrasound is very useful for both making the diagnosis and determining the etiology. In the early stages of pregnancy, fetus is less compressed because of the relatively higher amniotic fluid volume as compared to the fetal volume, and the fetus assumes non-cephalic position in general. Most of the fetuses in transverse situs in early weeks of pregnancy will assume cephalic or breech presentation in the advancing pregnancy weeks.

Table 4. Maternal and Fetal Outcomes Based on Fetal Position

	Dorsoinferior Position Group 1 (n=64)	Dorsosuperior Position Group 2 (n=49)	P value
Operation Time	73± 14 (54 – 112)	59±18 (46 – 95)	<0.001
Delta Hemoglobin *	1.8± 0.3	1.4±0.4	0.02
Uterine artery injury	7	2	0.04
Uterine Atony	2	0	>0.05
Need for Transfusion	1	0	>0.05
Preterm birth (<37 Weeks)	8	7	>0.05
Need of Neonatal Intensive Care Unit (NICU)	12	7	>0.05

**Delta Hemoglobin: preoperative hemoglobin – postoperative hemoglobin difference*

In a study of Olinyole et al., it was reported that 15% of 146 fetuses who were in transverse situs in 24 to 28 weeks of pregnancy persisted in this at term.[7] Likewise, Phelan et al. found in their study on 29 pregnant women that 24 fetuses (83%) assumed vertex (15/24) or breech (9/24) presentations. Five fetuses included in this study (17%) were persistent in transverse situs till term. The rate of caesarean section rate in this study was 13/29 (45%).[8] If the labor is allowed to advance in neglected transverse presentation, shoulder will be forced into the pelvis, and the contralateral arm will commonly prolapse; this can even result in cord prolapse. Upon entry of the shoulder into the pelvis, persisting uterine contractions can thin down the lower uterine segment to create pathologic myometrial retraction circle, and this can result in uterine rupture.[15] Follow-up of patients starting the labor with transverse situs and timing of delivery through caesarean section protect both the mother and the infant from very significant maternal and fetal complications. Otherwise, the process can become the subject matter of judicial proceedings.[16]

Prematurity is the most common risk factor for transverse presentation. Rate of patients who were <37 weeks also in our study was 21.2% (24/113). Other risk factors include high numbers of parity, placenta previa, narrow pelvic structure, uterine anomalies and masses, polyhydramnios, fetal anomalies and multiple pregnancies.[1] In our study, the rate of gravida ≥3 was found as 52.2% (59/113). We studied the transverse situs not associated with placenta previa and multiple pregnancies in our study. The possible etiologic factors were determined as gravida, parity, uterine anomalies, myoma uteri and fetal anomalies, consistently with the literature.

Since the imaging methods, emergency caesarean section and neonatal intensive care possibilities are not easily accessible in developing countries, mortality and morbidity rates related to transverse situs are also higher. In a study conducted by Seffah et al. in Ghana on 152 patients, 2 maternal deaths, 25 stillbirths, and 37 cases needing care in neonatal intensive care unit were found.[17] While placenta previa, umbilical cord prolapse, fetal trauma and prematurity are the major complications of transverse situs in developed countries, uterine rupture associated with elongated labor is the most important complication resulting in perinatal maternal mortality and morbidity.[13] No maternal complications were seen in our study. We have the opinion that this can be explained with early diagnosis of patients and delivery carried out with good timing without allowing the labor to extend. However, one fetal loss and fetal complications in 14% were observed. The increased rates in fetal morbidity and mortality rates, although expected in vaginal delivery, in our cases with transverse situs show that such cases require greater attention.

Upon comparison of groups based on the position of the fetal spine, it was thought that the reason of preoperative and postoperative hemoglobin difference (delta hemoglobin) was higher in the dorsoinferior position, that is, higher bleeding in dorsoinferior position (Group1) was the significantly longer operation times in this group. Lower segment transverse incision was used as the uterine incision in all the patients. Taking the fetus out

takes longer time in dorso-inferior position, and since the back area of the fetus is the presented part, taking the fetus out requires wider uterine incisions. Incisions extended laterally are associated with uterine arterial injuries, excessive bleeding and elongated operation times.

CONCLUSION VE RECOMMENDATIONS

In our study that placenta previa and multiple pregnancy cases, which are significant etiologic factors in transverse situs, were excluded, BMI ≥25 kg/m^2 and gravida ≥3 were found as significant etiologic factors in addition to factors affecting the uterine volume. It must be kept in mind that transverse situs incidence can increase in these patients. It was found that dorsoinferior position with fetal spine positioned lower among the transverse positions gave poorer maternal and fetal outcomes as compared to the dorsosuperior position. Fetal position must be determined in the pre-delivery period, and the patient must be followed-up with this diagnosis and delivery must be planned, and required measures must be taken in the preoperative period.

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