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Case Report Isolated Umbilical Cord Cyst in Second and Third Trimesters

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ABSTRACT

The cyst might be solitary or numerous (more frequent). While single cysts are attributed to favorable perinatal outcomes during the initial stages of pregnancy, the presence of numerous different umbilical cord cysts, their persistence in the second and third trimesters, and their conjunction with other ultrasonographic anomalies are linked to a higher probability of a miscarriage, aneuploidy, or other complexation. The majority of the material on postoperative complications and treatment adherence of foetuses with umbilical cord cysts is minimal. We wanted to show the result of a third-trimester foetus with an isolated umbilical cord cyst. Due to foetal distress, the baby was delivered by emergency caesarean surgery at 39 weeks gestation. The infant seemed fine and cried immediately. It should be taken into account that large umbilical cysts, in the event of rapid proliferation, may pressure the cord vessels and cause foetal discomfort. It is essential to consider the ultrasound examination of the umbilical cord as one of the essential aspects of the test. In addition, it is advised to ascertain that a karyotype is necessary when we discover this issue with related abnormalities.

INTRODUCTION

The umbilical cord stands as an important link between the placenta and the developing foetus. It keeps a constant connection at the maternal-fetal interface. The umbilical cord allows the foetus to move, acquire motor skills, and mature. High-resolution obstetric ultrasonography is frequently used, which has made it possible to thoroughly examine the foetus, placenta, and umbilical cord (Hayes *et al.*, 2020)The clinical significance of an umbilical cord cyst in a pregnant woman is debatable. The long-term outlook and outcome of infants with this cord anomaly are yet unknown because the details of affected pregnancies are mostly based on case report findings. The purpose of this study was to characterize a foetus' prognosis with an isolated umbilical cord in the third trimester(Zangen *et al.*, 2010).

LITERATURE REVIEW

Umbilical cord abnormalities (UCA) are conditions in which fetal blood flow is diminished or terminated due to changes in the anatomy or function of the umbilical cord. UCA was associated with adverse pregnancy outcomes such as stillbirth, birth hypoxia, and emergency Caesarean section. However, estimates of UCA's involvement in these outcomes differ; for example, UCA is said to cause 3.4% to 20% of stillbirths. Some variations could be attributed to several stillbirth classification systems, not all of which specify UCA as a cause of death (Hayes *et al.*, 2020). The study (Zangen *et al.*, 2010) evaluated the prognosis and clinical approach for fetuses with umbilical cord cysts during the second and third trimesters of pregnancy. Parental Karotype testing was employed to analyze umbilical cord cysts during pregnancy. According to the study, it was determined that umbilical cord cyst occurrence during the first trimester ranges from 0.4% to 3.4%. The incidence of umbilical cord cysts in the second and third trimesters was unknown, and prior research has been limited to case reports. There is a variation in diagnostic value and prognosis of umbilical cord cysts in the first and second trimesters (Zangen *et al.*, 2010). Most studies conclude that most first-trimester cysts are transitory and have no negative impact on pregnancy outcomes (Rempen, 1989; Skibo *et al.*, 1992).

Additionally, a study (Zangen & Yaffe, 2009) elucidated that sonographic advances have enhanced parental detection of foetal umbilical cord and placental abnormalities. In the first trimester, the prevalence of umbilical cord cystic masses ranges from 0.4% - 3.4%. Umbilical cord cysts in the second and third trimesters are a rare sonographic finding, and their prevalence is unknown. There is a strong link between umbilical cord cysts and fetal abnormalities, but it is not ubiquitous (Zangen & Yaffe, 2009).

Furthermore, another study (Campo *et al.*, 2017) indicated the complexity of parental diagnosis of umbilical cord cysts. The study stated that small cysts could be identified in up to 3% of first-trimester pregnancies. They are typically accompanied by additional structural or chromosomal anomalies (up to 20%). If they grow in size and persist, they potentially endanger the fetus by restricting blood flow through the umbilical cord, either through compression or thrombosis (Campo *et al.*, 2017).

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Case report

History

A 35 years old lady with gravida 6, para 3, and abortus 2, all through normal vaginal delivery (NVD), came to King Fahad Hospital for Antenatal Care (ANC) at 26 weeks gestational age according to her last menstrual period of induced pregnancy due to 6 years of secondary infertility. The patient had a regular antenatal visit at a private health center which made her pregnancy uneventful throughout. Her vital signs and physical assessment were unremarkable. The patient has not been prescribed any chronic medication except for some health tonics. The medical, surgical, and family history of the patient is unexceptional.

Examination

The patient appears quite well, not pale or cyanosed. Her blood pressure was recorded at 100/80 mm Hg. Her pulse rate was 100 per minute, whereas the respiration rate, body temperature, and Body Mass Index measurements were 20, 30°C, and 30 kg/m2, respectively. The fetus's gestational age was observed to be 30 weeks, corresponding to the date.

Investigation

The investigations revealed the patient's hemoglobin to be 11 gm/dl. The blood group was determined to be AB+ve, and the urine profile was clear. A liver function test and renal function test were conducted, and the result of both appeared to be normal. Karyotyping was not done due lack of the facilities

U/S: During the early ultrasound, a 3cm unilocular cyst in the cord surrounding the umbilicus was noticed. The linear ventral wall was not affected. The cyst's echo texture was homogeneous and resembled amniotic fluid. Umbilical veins emerge from the cyst (Figure. 1, 2, and Figure. 3).

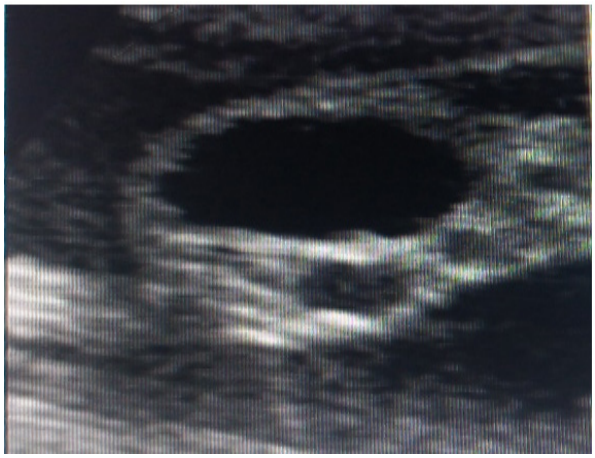

Figure: 1 Unilocular cyst within the cord with homogenous echo texture similar to amniotic fluid, the ventral wall is intact

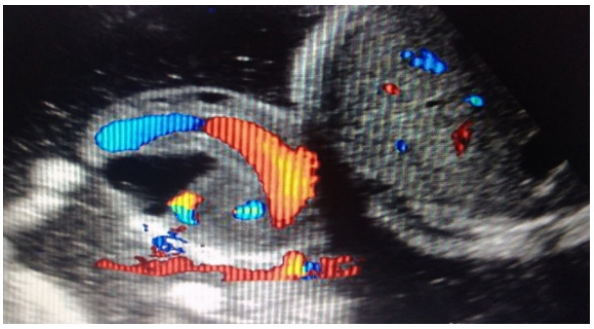

Figure: 2 Umbilical vessels seen splay around the cyst. The cord's allantoic cyst was presumed to be diagnosed. At 30 weeks, a second ultrasound revealed that the cyst had grown to 4.6 cm in diameter (Figure. 3).

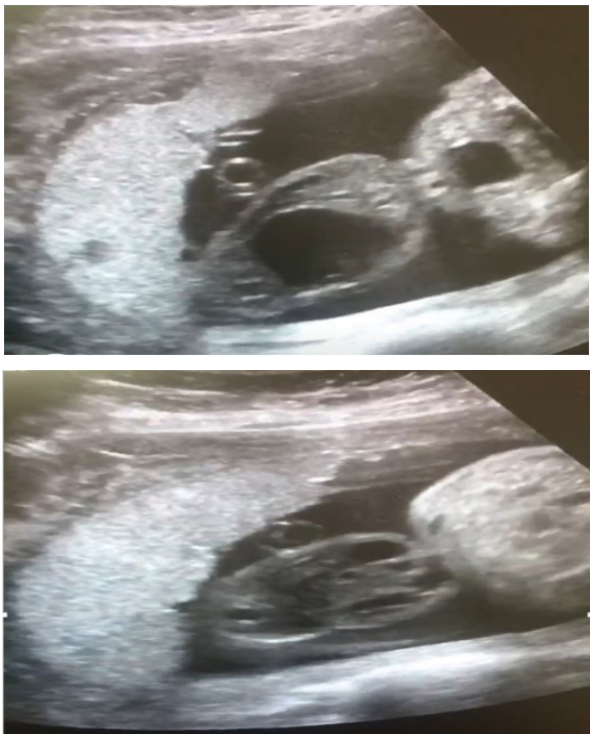

Figure: 3 Umbilical cord at 30 weeks' Cross sections of the cord can be seen in the diagram above, with vessels splaying around a core cyst and a more peripheral pseudo cyst. Serial sonograms revealed normal foetal development, fluid, and Doppler assessment of the umbilical cord, but cord oedema appeared at 30 weeks' gestation. Fetal monitoring and amniotic fluid evaluations were carried out twice a week, which was promising.

Management

The patient was referred to Fetal Medicine Unit (FMU) for a routine scan, and the congenital malformations were ruled out, so she went for a 2-week ANC to monitor fetal growth and to check for any symptoms of Intrauterine growth restriction (IUGR), abnormal umbilical artery Doppler). Also, the patient opted to have a normal vaginal birth unless there is a fetal cause for Caesarean section (C.S.), such as severe IUGR.

An emergency C.S. delivered the baby due to fetal distress at the gestation week of 39 weeks. The baby cried immediately after birth, weighed 3.1 kg, and looked healthy and normal with no apparent congenital malformation. All the tests, including abdominal, pelvic, and bladder ultrasound conducted, came out normal, and a urologist and pediatrician saw the baby, and all investigations were normal. The patient was discharged, and the baby was followed up after four months with no complications and looked healthy.

DISCUSSION

Allantoid cysts are real umbilical cord cysts. They grow from persistent allantois structures, and due to their connection to the bladder, the cysts contain urine. The cord vessels are divided by the central allantoid cysts of the umbilical cord. A correct prenatal diagnosis is essential since allantoid cysts are not associated with chromosomal abnormalities (Bouariu *et al*., 2021). Despite having a connection to the bladder of the urine, allantois disappears during the seventh embryonic week. (Bunch *et al*., 2006a; Sadler, 2018). Urine passing through a patent allantois may cause the development of allantoid cysts with their centers in the urethra. These cysts frequently divide the vasculature of the umbilical cord. Third-trimester spontaneous rupture of allantoid cysts is the norm (Matsui *et al*., 2007; Weichert *et al*., 2009). With ultrasonography, a patent allantois can be identified (Bunch *et al*., 2006b; Fuchs *et al*., 2008; Matsui *et al*., 2007; van der Bilt *et al*., 2003).

Any cystic lesion, or fluid-filled sac, on the umbilical cord is regarded as an umbilical cord cyst. They can be discovered in any place along the umbilical cord and commonly appear between blood vessels. They have uneven forms. A patient could have one or more than one cysts. Doctors use ultrasound technology to identify umbilical cord cysts most prevalently during the first trimester. First-trimester umbilical cord cysts typically have no repercussions on pregnancy, foetal development, or delivery. If a placental cyst is connected near where the umbilical cord is attached, it may slow the development of the foetus. To guarantee the proper flow of blood via the umbilical cord, a doctor should keep a close watch on any placental cysts that are present close to the placement of the chord. (Babay *et al*., 1996). However, complications are more likely to occur if cysts persist into the second or third trimester. (Chen *et al*., 2020). They may come with an increased risk of miscarriage or structural anomalies if they are combined with other abnormalities. There are two kinds of cysts in the umbilical cord (Ross *et al*., 1997).

True cysts

A real cyst forms at the placental end of the umbilical cord just before it joins the baby. The embryo's fluid is contained in a tiny strand of the umbilical vesicle. They typically range in size from four to sixty millimeters. True cysts typically disappear by themselves (Zangen *et al*., 2010).

False cysts

False cysts, also known as pseudo cysts, are more prevalent than real cysts. They can arise at any point along the umbilical cord. A false cyst contains fluid from Wharton's jelly or the cushiony substance between blood vessels. (Kausha *et al*., 2019) They can grow as large as six centimeters. False cysts may relate to chromosomal anomalies or genetic conditions in the baby (Nicolaides, 2004).

At various stages of pregnancy, umbilical cord cysts can be detected with ultrasound. During the first trimester, the frequency of occurrence of umbilical cord cysts ranges from 0.4 to 3.4% (Ghezzi *et al*., 2003). It is unknown how frequently umbilical cord cysts occur during the second and third trimesters, and previous research has only focused on case reports or small series. Umbilical cord cysts in the first and second trimesters vary in their clinical significance and prognosis. The majority of studies conclude that most first-trimester cysts are brief and do not affect the outcome of a pregnancy. However, the prognosis appears to be comparable to that of second-trimester cysts in cases of chronic cysts (Fox, 1978). Nevertheless, a few case reports/studies examine the outcomes of pregnancies involving umbilical cord cysts, and these may provide some insight into the matter. 13 cases of abnormalities in umbilical cord cysts in the second and third trimesters were found in a U.K. study. Similar to the findings of our case report, they reported two isolated, clear cysts on the umbilical cord with no apparent congenital malformation.

(Sepulveda, 2003) reported very different results. 13 foetuses with umbilical cord cysts throughout the second and third trimesters of pregnancy were reported, along with their results. Further sonographic observations were recorded in 11 of them. Ten of these foetuses underwent prenatal karyotype testing, which detected aneuploidy in 7. There were several abnormalities in two of the three cases, with normal karyotypes and an isolated omphalocele in one of the cases. In a further case with isolated omphalocele, karyotyping was not performed. All chromosomally aberrant babies died in utero or during the neonatal period, as did two chromosomally normal foetuses with numerous concomitant morphological abnormalities.

Even though the (SMITH *et al*., 1996) study detailed the results of three cases involving umbilical cord cysts, one cannot be compared to this study because the patient did not provide the first-trimester report, and the cyst continued to grow until the third trimester. In that study, a transient cyst was discovered at the end of the first trimester, and it disappeared in the second trimester with a typical outcome.

According to a 2015 study from the United Kingdom, after the exceedingly rigorous anatomical screening, the umbilical cord cyst was the sole abnormal diagnosis in seven of the 10 cases reported, while polyhydramnios and suspected IUGR without structural problems were also detected in one case. In each of these scenarios,

normal newborns were delivered. Moreover, this is what this study is expected to reveal. Findings support previous results that second and third-trimester umbilical cord cysts are related to foetal abnormalities. However, the prevalence of anomalies appears to be significantly lower, and the clinical outcome is frequently good.

Taking into account all of these diverse study findings and assuming that there is no obvious congenital abnormality and no IUGR, it is appropriately considered to marginalize chronic urachus by a specialized doctor after delivery. All studies show a link between second- and third-trimester umbilical cord cysts and foetal abnormalities. Fetal abnormalities were seen in 80-85% of the cases reported by (Sepulveda, 2003; SMITH et al., 1996). (Ross et al., 1997) found a perfect association between chronic second-trimester cysts and abnormalities. In 38% of the instances, (Shipp et al., 1995) found foetal abnormalities. Unfortunately, karyotyping was not performed on our patient due to a lack of facilities; nonetheless, the absence of obvious congenital abnormalities minimizes the possibility of having chromosomal abnormalities (Kilicdag et al., 2004).

CONCLUSION

An umbilical cord cyst is a medical condition that affects fewer than one percent of women and typically does not represent a risk to the infant. Accurate evaluation of the embryo, fetus, placenta, and umbilical cord has been made possible by the widespread use of high-resolution obstetric ultrasound. In isolated cases, there is no increased risk of recurrence of umbilical cord cyst. Performing an accurate evaluation of the umbilical cord during the routine ultrasound pregnancy examination is essential. The need for a fetal karyotype must be taken into consideration if other abnormalities are found during a comprehensive ultrasound examination in the event of a cord cyst diagnosis.

RECOMMENDATIONS

To reduce maternal and neonatal morbidity and mortality due to umbilical cord cysts, I recommend that obstetricians and gynecologists be well-trained in obstetric ultrasounds. Suppose a patient is diagnosed with an umbilical cord cyst. In that case, she should have a detailed ultrasound examination of fetal karyotyping for non-isolated cases. If any cord cyst is suspected, it should be immediately referred to FMU to confirm the diagnosis. In case of congenital malformation associated with umbilical cord cyst, the problem should be ruled out on priority.

There should be close growth monitoring for the detection of IUGR. A multidisciplinary team should be appointed to determine the mood of delivery, and the presence of a pediatrician must be assured at the time of delivery. Assessment of persistent urachus or any urachus abnormalities should be ruled out after delivery. Most important of all, the mother should be schooled about the process and the case after that.

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Competing interests

There is no conflict of interest, financial or otherwise.

Consent for publication

The authors agree to the final version of the paper.

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