

CASE REPORT

Stillbirth in dichorionic twins discordant for major and minor anomaly, followed by asynchronous delivery – a rare occurrence. Case presentation

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Abstract

The single stillbirth long-term intrauterine retention in dichorionic twin pregnancy is rarely reported. Also, the birth of a fetus is followed in most cases by immediate expulsion of the second twin. We hereby present an unusual case of asynchronous delivery of dichorionic twins, associating discordance for major and minor anomaly. The intrauterine death of the twin A, presenting a large sacrococcygeal tumor, occurred in the second trimester. The deceased twin A was born at 29 weeks' gestational age (GA). The twin B was extracted by Caesarean section at 31 weeks and had a good outcome. We performed a close follow-up of the high-risk pregnancy and we used tocolytic and antibiotic drugs for prolonging it. Corticoid therapy was administered for the lung maturation of the second twin. The expectant management in the single twin stillbirth dichorionic pregnancy and the asynchronous delivery had a significant impact on the newborn outcome.

Keywords: twin pregnancy, stillbirth, asynchronous delivery, sacro-coccygeal tumor.

Introduction

The prenatal ultrasound (US) diagnosis amplified worldwide [1]. Screening techniques for aneuploidies [2] and prenatal anomaly scans [3, 4] are provided on large-scale populations in many European countries. The benefits related to this non-invasive method of investigation are not debatable anymore, and the prenatal care should be offered to all pregnant women.

In multiple pregnancies, the fetuses share the same development space – the uterine cavity, and this circumstance leads to their interdependence, regardless the chorionicity. This situation is even more obvious and challenging in discordant for a major anomaly fetuses or in single fetal death cases, the pregnancy outcome being strongly influenced by the evolution of the fetal-placental units. Although the antepartum death of one or more fetuses in multiple pregnancies is more common than in singleton pregnancies (1% to 5% of all multiple pregnancies [5–7]), the intrauterine death of one fetus in a twin pregnancy is uncommon in the second or third trimester [8]. Particular attention should be paid to the status of the single surviving fetus, as he carries a high risk of mortality or major morbidity (especially by means of neurological sequelae and preterm birth) [5–13].

In most cases in twin pregnancies, the expulsion of the first twin is followed by the expulsion of the second one, due to uterine contractility persistence. In rare cases, the second twin is maintained inside the uterus for a various time interval. In these cases, the uterine contrac-

tility subsides after the first expulsion, either spontaneous or medically induced. The time elapsed between the two expulsions may vary from several hours to several weeks, and even months [14–22]. Extending this interval usually have substantial benefits for the *in utero* surviving cotwin, especially between 28–32 weeks gestational age (GA), as the newborn outcome in this group is strongly influenced by the GA, by the birth weight and by the corticosteroid administration at least 48 hours before birth.

Sacroccygeal teratoma is a rare major fetal malformation, leading to renal, urinary, digestive and heart complications and even to fetal death [23, 24]. The antenatal diagnosis of a twin with this condition in requires careful follow-up measures, particularly in voluminous tumors. The chances of prolonging the pregnancy in twin pregnancies complicated by the expulsion of a fetus with a large tumor are reduced, by the large opening the cervix during the expulsion.

The long-term retention of a dead fetus can harmfully influence the evolution of the pregnancy, by infectious complications and clotting homeostasis disorder, the rate of these ominous events being directly dependent to the time elapsed until the expulsion [25].

Currently, to our knowledge, there are not prospective studies on large population groups of discordant for major anomaly twins, due to the rare occurrence of this condition. Also, standard protocols in asynchronous twin deliveries are difficult to design; thus they are not yet available.

Case presentation

We present a twin dichorionic pregnancy discordant for major and minor anomaly, followed by an asynchronous delivery. The mother is a 35 years old pregnant woman, with a history of spontaneous uneventful vaginal birth, 16 years ago. She was admitted for mild back pains and uterine contractions. Carrying an unintended pregnancy, she had no prior presentation in our Prenatal Diagnostic Unit and no antenatal care.

US examination, following the current guidelines showed: 19 weeks and five days of amenorrhea (19+5 weeks of amenorrhea) (WA); dichorionic-diamniotic twin pregnancy (Figure 1); single intrauterine death (twin A), the fetus presenting a large sacrococcygeal tumor (11/8/10 cm) and hydrops, the fetal biometry consistent with a 20 weeks and three days GA pregnancy (Figure 2); the twin B – biometry consistent with a 21 weeks GA fetus, presenting bilateral clubfoot, without any other structural defects (Figure 3).

According to our institution customs and to the parental desire, an expectant management has been decided. A double amniocentesis has been offered, for the genetic assessment of the fetuses, but the patient declined the maneuver. At the time of writing, in our country, very few of the prenatal genetic tests are free of charge for the high-risk patients, through the Health Insurance Institution [the quantitative fluorescent polymerase chain reaction (QF-PCR) only]. The process of subsidize is still ongoing for full conventional G-banding karyotype, fluorescence

in situ hybridization (FISH), multiplex ligation-dependent probe amplification (MLPA) and array comparative genomic hybridization (arrayCGH).

Standard maternal blood sample and vaginal swabs workup was performed. The uterine contractions remission was achieved. The patient was discharged after a week. She was offered an outpatient close follow-up program, including standard blood tests and non-specific inflammation serum markers twice/month and weekly US assessments.

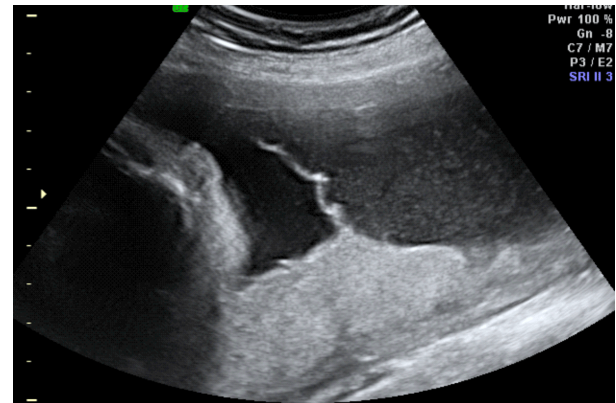


Figure 1 – The thick membrane separating the two pregnancies seen. The different echogenicity of the amniotic fluid surrounding the two fetuses seen (right – increased echogenicity in twin A gestational sac; left – normal anechoic amniotic fluid in the twin B gestational sac).

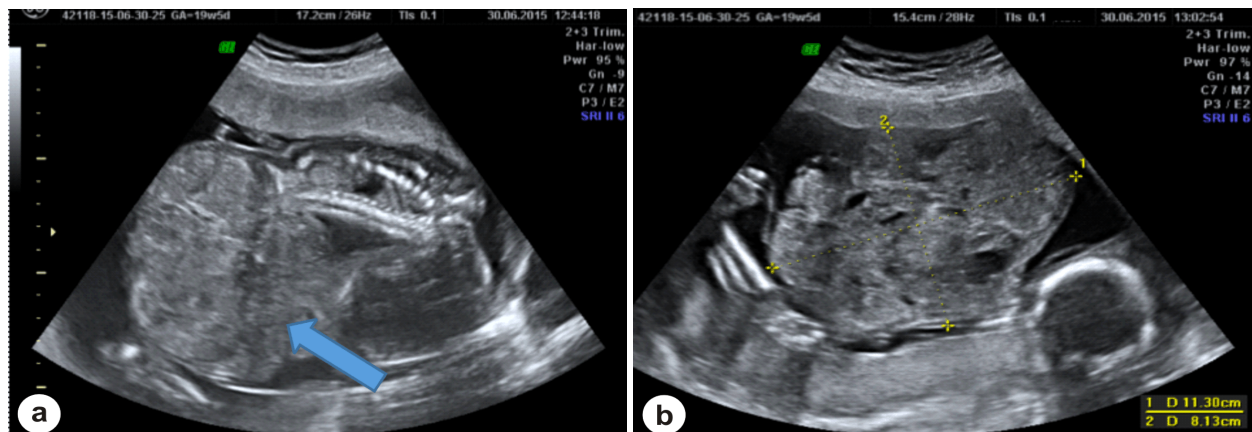


Figure 2 – (a and b) Sacro-coccygeal tumor of the twin A, on transabdominal US examination (20 weeks of amenorrhea, the first antenatal pregnancy assessment).

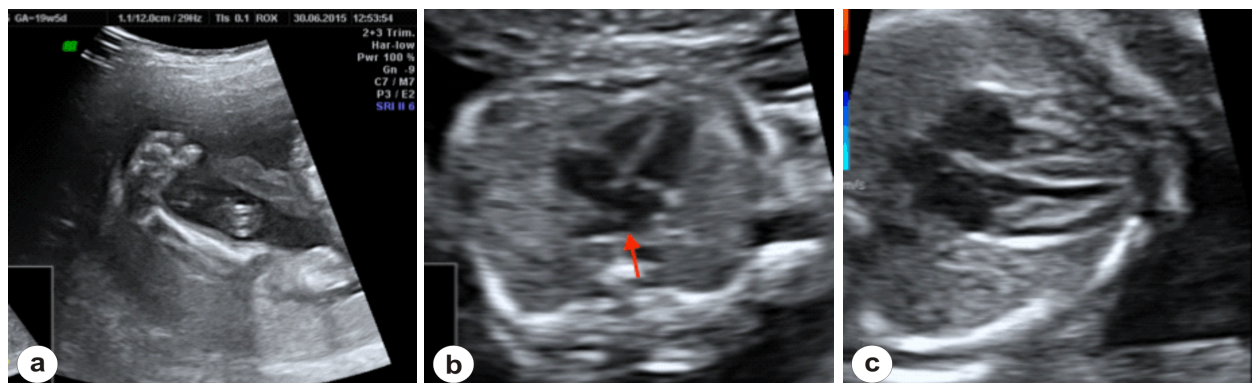
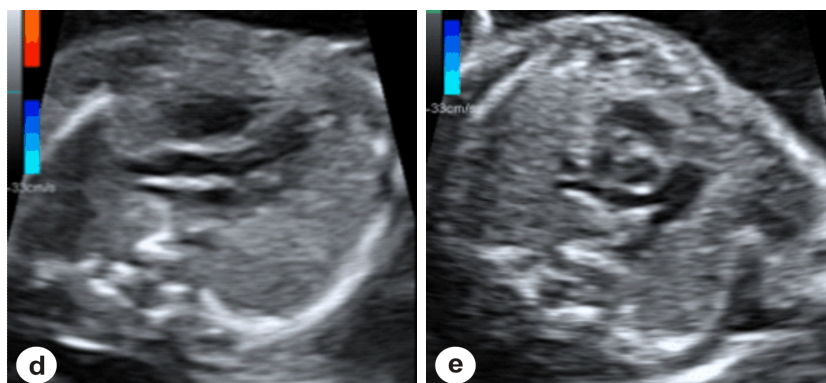


Figure 3 – Details of fetal anatomy (twin B). (a) Right foot seen (congenital clubfoot), showing the abnormal angle between the foot and the lower leg. Intracardiac details: (b) The four chamber view from an oblique apical insonation; the left atrium anatomy highlighted (red arrow), with the pulmonary veins entrance; the normal off-setting of the atrio-ventricular valves is seen; (c) The four chamber view from the right shoulder, in lateral insonation.

Figure 3 (continued) – Details of fetal anatomy (twin B). Intracardiac details: (d) The five chamber view; (e) The short axis view.



Subsequent US scans of the twin B confirmed a normal fetal growth pattern (Figure 4) and the presence of all US well-being features.

At 28 weeks and six days GA, the patient was admitted again, with uterine contractions.

Two days later the stillbirth twin A was born.

The maceration phenomenon and intense specimen degradation (Figure 5) prevented a good quality conventional autopsy and histological information by sampling internal organs.

The remission of the uterine contractility was medically induced and the umbilical cord was sectioned close to the external cervical os (Figure 6). The twin A placenta was left inside the uterus. Vaginal showers were performed daily, using antiseptic solutions.

The twin B maintained US markers of well-being. The US appearance of the separating membrane changed, having an increased echogenicity (Figure 7).

Subsequently, reduced contractility was maintained by tocolysis with beta-mimetic drugs (Hexoprenaline sulphate 0.05 mg \times 2/day intravenously). Prophylactic antibiotic drugs were administered (Clindamycin 300 mg \times 4/day, intravenously). The standard blood sample workup and inflammation markers were daily collected. The remaining fetus' biophysical profile was assessed by US every 24 hours. The cervical length (measured using the trans-abdominal and the transvaginal probe) remained normal (39 mm at 12 and at 24 hours after the twin A expulsion) (Figure 8).

Nine days after, at 30 weeks and three days GA, pre-term premature spontaneously rupture of the twin B membranes (PPROM) occurred. A complete course of antenatal corticosteroids was administered, for the lung maturation of the twin B (Dexamethasone four doses, 6 mg/6 hours). Two days later, he was extracted by Caesarean section. The reason for deciding the pregnancy termination was the progressive alteration of both maternal blood testing results, and the non-reassuring fetal state, assessed by means of the Manning biophysical score (score 4).

The following 48 hours after the membranes rupture, the twin B lie was persistent transverse (dorsoinferior – back down). The fetal extraction was challenging, even if performed by an experienced obstetrician, due to the absence of the amniotic fluid. The severe molding of the uterus and the extreme flexion of the fetal trunk made the access of the extracting hand to the fetal breech (positioned at the uterine fundus) exceedingly difficult. In order to perform the intervention, intended to be protective for the preterm fetus, an inverted T-shaped corporeal incision was necessary.

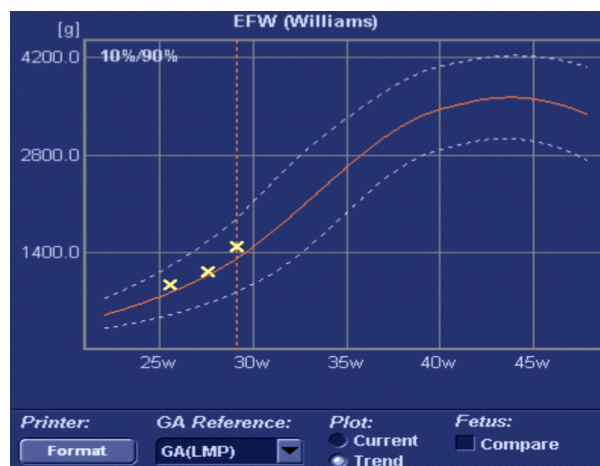


Figure 4 – The estimated fetal weight of twin B at consecutive US scans (normal growth curve).

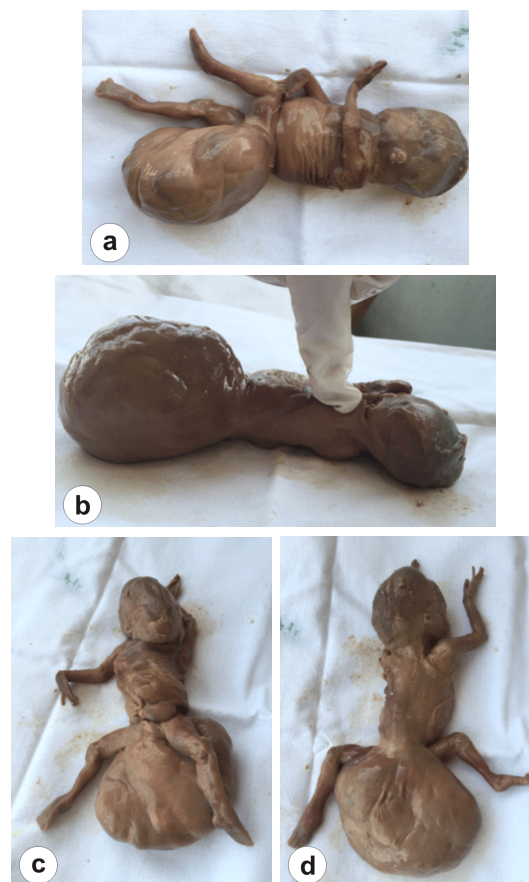


Figure 5 – (a–d) The macroscopic appearance of the twin A after birth, presenting voluminous sacro-coccygeal teratoma.



Figure 6 – Vaginal speculum applied after the twin A birth. The mummified umbilical cord of twin A (sectioned close to the external cervical os) is seen.

The male fetus, weighing 1380 g, was extracted. The Apgar score was 7 after the first minute of life. The twin A placenta was extracted along with the twin B one (Figure 9). The uterine incision was sutured in a three-layer fashion.

The phenotype of the newborn baby was normal and the subsequent evolution was uneventful.

Microbiological cultures from both samples of amniotic fluid were negative. The placentas were examined, sectioned and prepared according to the *College of American Pathologists* guidelines. Histological chorioamnionitis and funiculitis, defined as the infiltration of neutrophils into the amnion and chorion in response to a bacterial infection, was confirmed in twin A fetal adnexa (Figure 10).

Prophylactic antibiotic drugs and low molecular weight heparin were given postoperative. The mother had a favorable evolution also. Both patients were discharged in good health after 14 days. Orthopedic treatment (bilateral cast splint) was offered to the newborn baby (Figure 11).

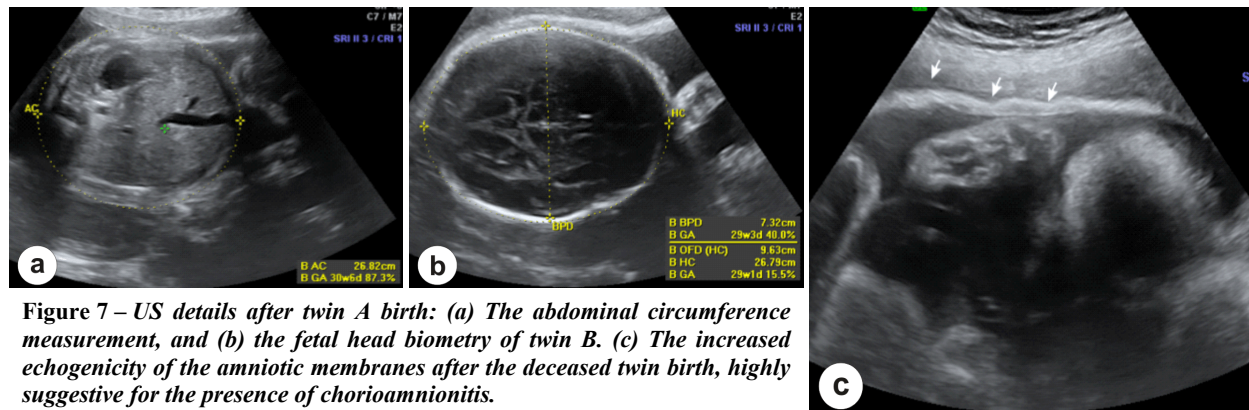


Figure 7 – US details after twin A birth: (a) The abdominal circumference measurement, and (b) the fetal head biometry of twin B. (c) The increased echogenicity of the amniotic membranes after the deceased twin birth, highly suggestive for the presence of chorioamnionitis.

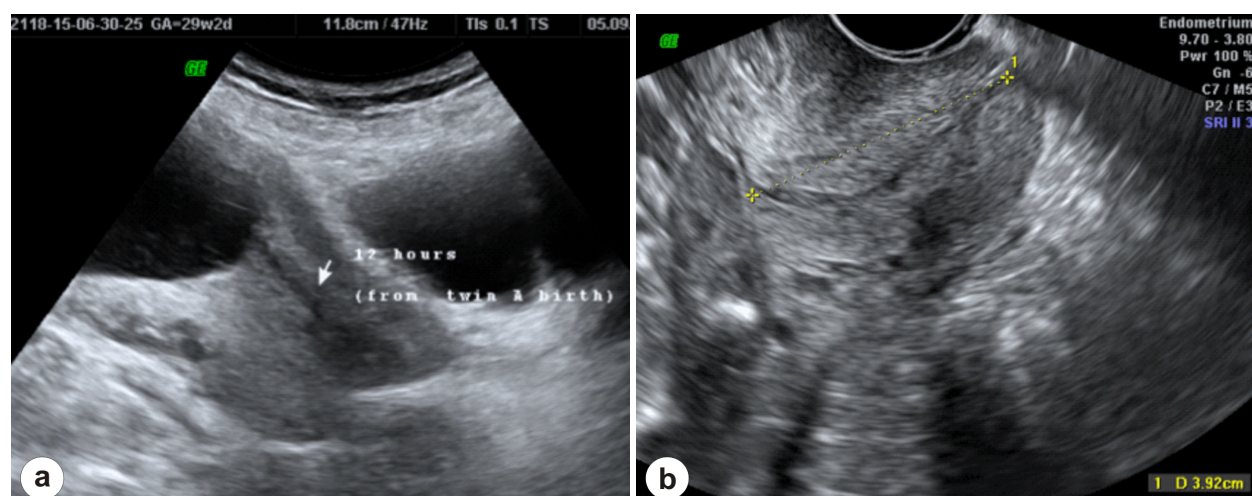


Figure 8 – Cervical length after the twin A birth, on transabdominal (a – 12 hours later) and on transvaginal assessment (b – 24 hours later).

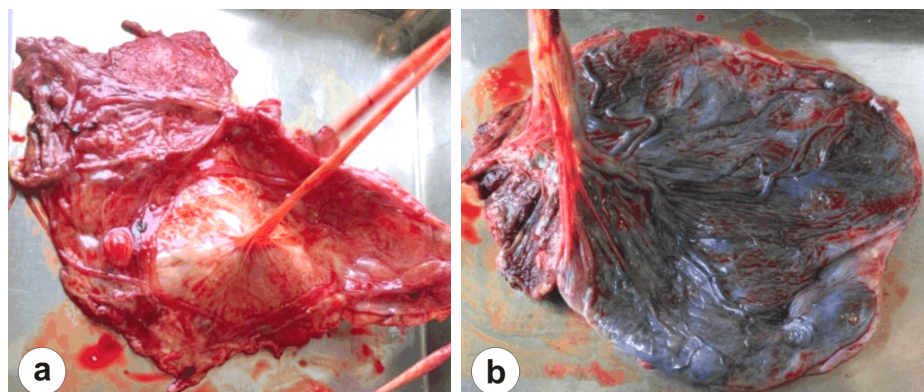


Figure 9 – Macroscopic pathology of the two placentae: (a) The twin A stillbirth placenta; (b) The twin B alive placenta.

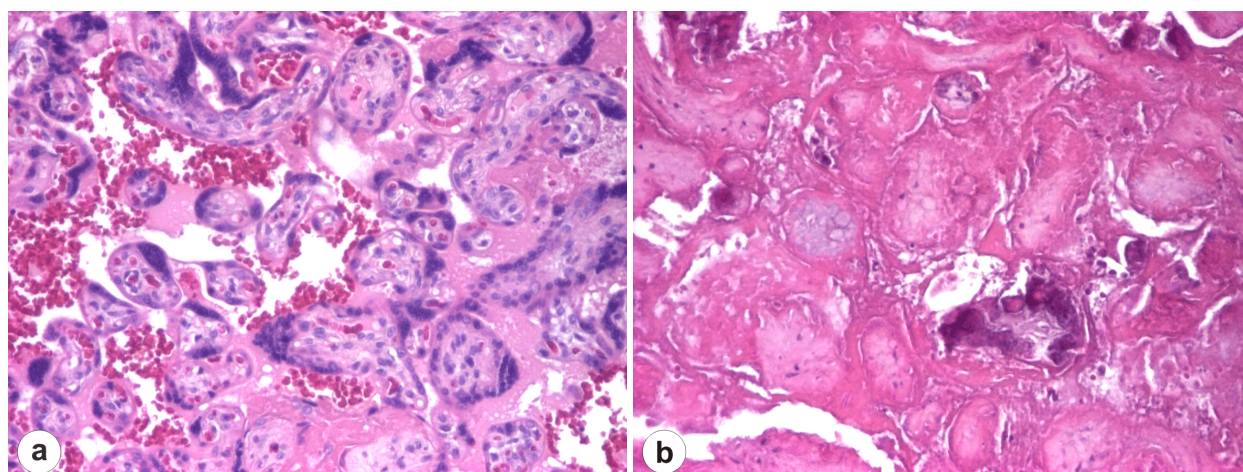


Figure 10 – Twin A placenta (HE staining, $\times 100$): (a) Mature intermediate villi, with blood and neutrophils infiltration and intervillous necrosis; (b) Placental infarction, microcalcifications.



Figure 11 – The live newborn (twin B) postpartum aspect. The antenatal suspected bilateral clubfoot was confirmed after birth.

Discussion

Antepartum death of a single fetus complicates 2.5–5% of all twin pregnancies and may be associated with significant morbidity and mortality in the surviving cotwin [8]. Although the morbidity is more frequent among survivors of monochorionic pregnancies, serious consequences in the survivor in dichorionic twin pregnancies may also occur (double fetal demise [9], neurological abnormalities [10, 11], growth restriction, abnormal antepartum fetal heart rate testing [6] and Caesarean delivery for non-reassuring fetal status [6]).

Potentially, communicating vasculature in dichorionic twin pregnancies may account for these unusual occurrences [8]. Gold *et al.* [12] described a dichorionic twin gestation in which (despite the absence of communicating vasculature) neonatal ultrasonography showed bilateral frontal lobe cystic lesions in the surviving twin.

From the first trimester up to the time of birth itself, ultrasound examination plays an indispensable role in fetal surveillance and in optimizing the outcome of twin pregnancies [5, 13, 26].

The cervical length measurement is not a proven useful intervention that prolongs pregnancy or alters the outcome, and thus is not yet recommended as routine. Still, as in singleton pregnancies, this measurement is the most important predictor of preterm birth in twin pregnancy. A cervical length under 25 mm is a useful parameter to decide whether or not a patient should

receive intensified antenatal prevention measures [27]. In the above case, the patient evolved with normal cervical length after the twin A birth, and presented afterwards an association of long cervix and PPRM. Due to this circumstance, the team decided against a prophylactic cerclage.

Asynchronous birth (extended interval between the two births) of fetuses in twin pregnancy is a rare phenomenon. The spontaneous evolution towards immediate evacuation of the second fetus occurs in most cases. The benefits of delaying the delivery of the second fetus had been outlined in the few studies published [14–18]. This topic gain interest since its first publication in 1957 by Abrams [28].

Arabin & van Eyck concluded in 2009, after observing a significant number of cases, that delaying the birth of the second fetus has more advantages if the birth of the first fetus occurs between 20 to 29 weeks GA; if the first twin is born before 20 weeks, the survival chances of the cotwin are much lower [14]. There are still controversies in regards to prolongation of pregnancy after 32 weeks, but there are studies reporting the extension up to 36 weeks [19].

Cervical cerclage was previously considered, in order to reduce risk of ascendant infection. It was either routinely performed after the expulsion of twin A [20], or selectively performed (using the cervical length and/or other predictive risk factors for preterm birth) [14, 16, 21]. None of the different approaches has led to significant outcome improvement. The hypothesized mechanisms and theories require further studies. As mentioned before, we did not perform cervical cerclage after the twin A expulsion, due to persistent US normal cervical length, seen as an accurate predictive parameter for preterm birth.

The use of antibiotics has been proposed, either by means of targeted therapy after isolating etiological agents in cervical-vaginal cultures [17] or broad-spectrum antibiotics early administered [14]. After the expulsion of the twin A, we used systemic non-targeted antibiotic therapy and vaginal irrigations with dilute Chlorhexidine, in the attempt to reduce the risk of ascendant intrauterine infections leading to chorioamnionitis.

Corticosteroid therapy is broadly seen as standard approach for fetal lung development after 24 weeks GA

[14, 16, 18, 20, 22]. We also used steroid therapy in the management of the imminent preterm birth, 48 hours prior it.

Delaying the second birth is inadvisable in spontaneous membrane rupture and/or severe fetal malformations of the second fetus, severe preeclampsia or suspicion of chorioamnionitis. We did not face these conditions, with the exception of the latter one, suspected on progressive alteration of the maternal blood sample tests, immediately prior to the twin B delivery.

The presence of fetal structural anomalies (in our case a major abnormality – the voluminous sacrococcygeal teratoma and the minor abnormality – isolated bilateral clubfoot) should have been followed by genetic analysis of the pregnancy and counseling. In our case, the unavailability of subsidized genetic testing prevented accurate information.

In our case, the birth of the twin B was postponed 11 days after the twin A birth, and this favored the outcome of the newborn.

An early pregnancy loss, as in our case, is significantly more common in monochorionic than in dichorionic twins, and carries a higher prospective risk of mortality than the occurrence after 24 weeks' gestation [29].

We consider this case particularly interesting, due to several rarely seen features. The dichorionic twins were discordant for minor and major malformations. The latter (voluminous sacrococcygeal teratoma) led to an early intrauterine single fetal death. This event was followed by an unusual long time interval of intrauterine stillbirth retention (of about 11 weeks) prior to the twin B birth. Although this condition is known to trigger sometimes-significant complications, as infectious and clotting disorders, we had no maternal and fetal adverse outcome. Moreover, we succeeded to manage an asynchronous delivery, in order to optimize the outcome of the preterm live newborn.

✉ Conclusions

Expectant attitude in discordant for major structural anomaly dichorionic twin pregnancy is a feasible approach. In a twin dichorionic pregnancy, the long-term intrauterine retention of a single stillborn may be associated with a favorable outcome of the live fetus. The rare occurrence of an asynchronous delivery after 30 weeks of amenorrhea offers important benefits for the second twin. The close follow-up of such a risk pregnancy may improve the maternal and newborn outcome. Our case confirms that fetal surveillance following death of one twin should not less intense in cases of established dichorionic twin pregnancies. A customized approach is probable appropriate, a close follow-up being necessary in such at risk pregnancies, in order to improve the maternal and newborn outcome.

Conflict of interests

The authors declare that they have no conflict of interests.

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