



Obstetric Management of Delayed-Interval Delivery

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ABSTRACT

The delayed-interval delivery is a rare, flexible and complex procedure. In light of these facts, there is no consensus on the best approach to achieve it successfully. This case report is of an asynchronous delivery, in a twin pregnancy, with a 32-day interval between births of siblings. Our obstetric management at a critical gestational age improved the outcome of the second newborn. The probability of success of delayed-interval delivery depends on the proper selection of the candidates, the appropriate active management and the continuous monitoring for early detection of complications.

1. Introduction

Multifetal pregnancies are often complicated by spontaneous preterm delivery, thereby placing neonates at risk for serious morbidity and mortality [1–3]. The majority of preterm deliveries are due to idiopathic preterm labor and premature rupture of membranes [3].

In twin pregnancies, the birth of the first fetus is usually followed by the birth of the second twin in a short-time interval [2–7], on average 1,1 days [7]. However, in selected cases, preterm delivery of one fetus may not require the immediate birth of the remaining fetus. Delayed-interval delivery is characterized by an unusually long time after the birth of the first fetus [7,8], allowing the remaining fetus to stay in utero until reaching viability. This improves survival and reduces morbidity [1,8–10]. Despite the interest for this subject since its first publication by Abrams in 1957 [3,5,11], the rarity of this condition and the absence of large-scale studies confronts the obstetrician with a difficult problem about the optimal management of delayed-interval delivery [1].

The purpose of this study was to review the obstetric particularities of delayed-interval delivery with focus on the most controversial issues of active management, as well as maternal and neonatal outcomes. We report a case of an asynchronous delivery of a second twin with an interval of 32 days performed in our center. Informed consent to publish this case report was obtained from both parents.

2. Case Report

A 32-year-old primigravida with a spontaneous dichorionic twin pregnancy was admitted to our emergency department, at 20 weeks of gestation (WG), because of preterm rupture of membranes of the first fetus. She had no relevant personal medical history and her blood type was O Rh-positive. The ultrasound revealed two viable twins, with normal growth for gestational age and oligohydramnios of the first fetus. Furthermore, a normal cervical length and a subserous uterine fibroid with 10 cm were detected.

At 20 + 6WG, after spontaneous onset of labor, a female baby weighing 340 g was vaginally delivered and fetal death occurred within 1 h. The histopathological examination of the aborted fetus only showed multi-organic congestion.

After the delivery of the first twin, uterine contractions ceased and the cervix was reconstituted. There were no signs of chorioamnionitis. Amniotic membrane of the second twin remained intact and ultrasonography showed a healthy remaining fetus. After discussing the potential benefits and risks of delayed-interval delivery with the obstetric team, informed consent was obtained from parents. The umbilical cord of the first fetus was ligated high up in the cervix and its placenta was left inside the uterus. Consequently, cervical cultures were taken and the mother's perineum and vagina were disinfected with chlorhexidine. The patient remained in the hospital until the end of her pregnancy and was treated with bed rest, low-molecular-weight heparin and broad-spectrum antibiotics (11 days of Ampicillin and Gentamycin followed by 11 days of oral Amoxicillin). She was being

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continuously monitored through clinical assessment and laboratory tests. No signs of infection were listed and serial ultrasonography revealed normal fetal growth and wellbeing of the second twin. Digital vaginal examinations were avoided. At 24WG a course of antenatal corticosteroids (Betamethasone in two doses, 12 mg/24 h) was administered.

At 25 + 3WG, an urgent cesarean section was performed due to breech presentation after onset of spontaneous labor. A 685 g female neonate was delivered with Apgar scores of 1/8/9. The neonate received full resuscitation and immediate life-support intervention and was admitted to the Neonatal Intensive Care Unit, due to extreme prematurity and extreme low birth weight. Despite development of Hyaline membrane disease and patent ductus arteriosus, the baby had a satisfactory evolution, achieving spontaneous respiration when she reached her first month of life. She was discharged 90 days after birth.

The mother developed a postpartum sepsis due to endometritis. She was admitted in the Intensive Care Unit where she remained for 4 days. Twelve days after surgery she was discharged. No complications were listed.

The child exhibited normal cognitive and neurological development at her 15th month follow-up, but low weight and deficient physical development for age were still present. She also maintained the patent ductus arteriosus.

3. Discussion

In the present case, the latency interval between the birth of the first and second twins was 32 days. The duration of latency reported in the literature is extremely extensive ranging from 1 to 152 days [3]. For each day of delaying the delivery between the 23rd and 26th WG there is an improvement of 3% in infant survival [12], which justifies the pertinence of deferring delivery in this patient. Moreover, in multiple pregnancies the mortality rate was 32% between the 23rd and 25th WG [5], which highlights the interest of reporting this case as successful.

First of all, this patient fulfilled the conditions for deferred delivery of the second fetus: birth of the first fetus before 24WG, diamniotic pregnancy, intact membranes of the second fetus, absence of intra-amniotic infection and absence of fetal or maternal pathology involving urgent termination of pregnancy [13]. Secondly, the counseling and consent process of the parents addressed the benefits and risks of delayed-interval delivery, including maternal, fetal and neonatal risk of infection and the consequences of prolonging the pregnancy to a pre-viable to a per-viable gestational age [9,14]. Thereafter, our active management was based on what is reported in the literature, despite the lack of a consensual protocol for the handling of potential candidates for asynchronous delivery [1–5,7–9,11,13,15–17].

Cervical cerclage was not placed in this patient, due to progressive closing of cervix after the delivery of the first fetus. The use of cerclage is the most controversial issue among the treatment modalities [4,6,8,10–13,15,16,18]. Some authors defend the systematic placement of cerclage [4,10,16,17], while others are against this procedure [2]. In addition, several authors hypothesize its application only when cervical incompetence is the suspected etiology for preterm delivery [3,11–14].

According to the literature, some authors recommend routine tocolysis after the birth of the first twin [7,10,14,15,18]. On the other hand, in other reports tocolytic therapy was only considered when viability was reached [2] and uterine activity was present [3,13]. In this case, tocolytic therapy was not administered because it is not indicated before 24WG and besides that the mother's uterine activity had quiesced.

We opted for broad-spectrum antibiotics prophylaxis, which is in agreement with most authors [2,4,5,8,12,13]. There is no consensus about the drugs of choice, duration and route of administration [12]. Antibiotics not only protect against ascending infections but they also have tocolytic properties [5].

In this patient, an amniocentesis was not performed after the

delivery of the first fetus to exclude subclinical microbial invasion of the amniotic fluid. According to most authors, amniocentesis is not always successful in preventing future maternal complications [3,5,12].

As universally practiced, the steroid therapy was administered at 24WG for improvement in prognosis of the remaining fetus [2,6,11–13].

Although there are some reports where patients were permitted to leave the hospital [2–4,10,13], we preferred close monitoring for early detection of complications that could implicate the termination of pregnancy, such as chorioamnionitis, recurrent preterm contractions, signs of impending abruption and coagulation disorders [2,6,15].

Neonatal survival and morbidity are primarily dependent on gestational age at birth [2,3,5]. The survival rate after delayed-interval delivery is variable between different clinical centers (50–95%) [2]. Neonatal morbidity affects more than 50% of infants surviving to discharge [3]. In this case, the second twin survived, but experienced morbidities, including Hyaline membrane disease and patent ductus arteriosus. Some authors believe that neurological development and short-term [5,18] and long-term [5,7,8,14] outcomes of delayed delivery fetuses are comparable to children with the same gestational age. Although 15 month follow-up is a short-time period, a normal psychomotor and neurological development were reported which might predict the patient's growth over the years [6]. Still, a more prolonged pediatric follow-up is necessary.

Regarding maternal morbidity, even with careful monitoring, some complications may arise during or after the active management to delay the birth of the second twin [13]. Roman et al. described a 31,6% incidence of serious maternal morbidity [3,5,13]. The main maternal risks of delayed-interval delivery are intrauterine infection and maternal sepsis [2], which occur in 17–52% and 4–22% of these mothers, respectively [18]. This patient developed a septicemia after cesarean section of the second twin. However, there was no previous evidence of infection during the active management to delay delivery. This highlights the infectious potential that surgery may trigger, in addition to manipulations from the vaginal delivery of the first twin, the placenta retention and the contact of the umbilical cord with the vagina [7,8].

Despite the risks of maternal and neonatal morbidity, asynchronous delivery may be lifesaving for the second twin, as in the present case. By reviewing the literature, we observed a selection bias because positive results tend to be more published than the negative ones [9,10,17]. In conclusion, there is a need to standardize the management of delayed-interval delivery through additional research, including large multi-center studies and more case reports, regardless of the outcome [8,9,13].

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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References

- [1] C.-C. Vaduva, C. Constantinescu, M. Tenovici, et al., Delayed interval delivery in twin pregnancy – case reports, *Romanian J. Morphol. Embryol.* 57 (3) (2016) 1089–1098.
- [2] M. Cozzolino, V. Seravalli, G. Masini, et al., Delayed-interval delivery in dichorionic twin pregnancies: a single-center experience, *Ochsner J* 15 (3) (2015) 248–250.
- [3] A. Roman, S. Fishman, N. Fox, et al., Maternal and neonatal outcomes after delayed-interval delivery of multifetal pregnancies, *Am. J. Perinatol.* 28 (2) (2011) 91–96.
- [4] Y. Aydin, M. Celiloglu, Delayed interval delivery of a second twin after the preterm

- labor of the first one in twin pregnancies: delayed delivery in twin pregnancies, *Case Rep. Obstet. Gynecol.* 22 (4) (2012) 271–274.
- [5] T. Yodoshi, E. Tipton, C. Rouse, A case of delay delivery with a successful hospital move, *Case Rep. Pediatr.* 2015 (2015).
- [6] P. Padilla-Iserte, J. Vila-Vives, B. Ferri, et al., Delayed interval delivery of the second twin: obstetric management, neonatal outcomes and 2-year follow up, *J. Obstetr. Gynecol. India* 64 (5) (2014) 344–348.
- [7] M. Centeno, N. Clode, M. Tuna, L. Mendes-da-Graça, Parto diferido – evolução materna e perinatal, *Acta Obstét. Gynecol. Port.* 3 (3) (2009) 128–133.
- [8] F. Rodrigues, J. Pereira, T. Rodrigues, N. Montenegro, The clinical challenge of delayed interval delivery in multiple pregnancies, *Acta Obstét. Gynecol. Port.* 9 (2) (2015) 148–153.
- [9] S. Feys, Y. Jacquemyn, Delayed-interval delivery can save the second twin: evidence from a systematic review, *Facts Views Obgyn* 8 (4) (2016) 223–231.
- [10] E. Doger, Y. Cakiroglu, Y. Ceylan, et al., Obstetric and neonatal outcomes of delayed interval delivery in cerclage and non-cerclage cases: an analysis of 20 multiple pregnancies, *J. Obstet. Gynaecol. Res.* 40 (7) (2014) 1853–1861.
- [11] G.L. Zorila, M.C. Marinas, M. Florea, et al., Stillbirth in dichorionic twins discordant for major and minor anomaly, followed by asynchronous delivery – a rare occurrence. Case presentation, *Roman. J. Morphol. Embryol.* 57 (3) (2016) 1117–1123.
- [12] F. Magdaleno-Dans, S. López-Magallón, M. Sancha-Naranjo, et al., Asynchronous twin births. Case report and obstetric management review, *Ginecol. Obstet. Mex.* 84 (1) (2016) 53–59.
- [13] P.C. Udealor, I.V. Ezeome, F.C. Emegoakor, et al., Delayed interval delivery following early loss of the leading twin, *Case Rep. Obstet. Gynecol.* (2015).
- [14] F. Rodrigues, J. Pereira, T. Rodrigues, N. Montenegro, Parto Diferido na Gravidez Múltipla, in: N. Montenegro, T. Rodrigues, C. Ramalho, Campos D.A. Lidel (Eds.), *Protocolos de Medicina Materno-Fetal*, 3ª edição, 2014, pp. 188–189.
- [15] M. Kaneko, Y. Kawagoe, J. Oonishi, N. Yamada, et al., Case report and review of delayed-interval delivery for dichorionic, diamniotic twins with normal development, *J. Obstetr. Gynaecol. Res.* 38 (4) (2012) 741–744.
- [16] S. Petousis, A. Goutzioulis, C. Margioulas-Siarkou, et al., Emergency cervical cerclage after miscarriage of the first fetus in dichorionic twin pregnancies: obstetric and neonatal outcomes of delayed interval delivery, *Arch. Gynecol. Obstet.* 286 (2012) 613–617.
- [17] J. Zhang, C. Johnson, M. Hoffman, Cervical cerclage in delayed interval delivery in a multifetal pregnancy: a review of seven case series, *Eur. J. Obstet. Gynecol. Reprod. Biol.* 108 (2003) 126–130.
- [18] I. Temur, A twin pregnancy provided with ICSI, an abortion of the first fetus at the 18th week and live birth of the second fetus at the end of 36th week: a case report and literature review, *J. Matern. Fetal Neonatal Med.* 26 (13) (2013) 1355–1358.