

Outcome of Twin Pregnancies Complicated By Early Second Trimester Rupture of Membranes in One Sac

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The aim of this study was to present the outcome of bichorionic twin pregnancies complicated by early second trimester rupture of membranes in one sac. Data regarding all cases of ruptured membranes at 13–20 weeks in bichorionic twin pregnancies were collected retrospectively from three fetal medicine units. Patients who have chosen to terminate the pregnancy were excluded from the study. Between January 2003 and July 2009, nine patients met inclusion criteria. Three out of nine couples decided on expectant management, and six preferred selective feticide. With expectant management one fetus died in utero and take home baby rate was 83% (5 of 6 fetuses), delivered at 27–32 weeks. When selective termination was performed, all non-reduced fetuses were born alive at 33–40 weeks. Two survivors of rupture of membranes had limb contractures, none had lung hypoplasia. One patient had clinical signs of amnionitis, which was ruled out later on pathological examination. Her post partum course was uncomplicated. Our data suggest that rupture of membranes in one sac of bichorionic twins at 13–20 weeks has favorable prognosis whether an intervention is performed or not. Nonetheless, selective termination may have an advantage over expectant management, since gestational age at delivery was higher when selective termination was performed.

Keywords: biochorionic twins, early rupture of membranes, second trimester rupture of membranes, selective termination

Most twin pregnancies complicated by very early rupture of membranes (ROM) result in spontaneous delivery of both fetuses after a short latency period. Cases in which spontaneous delivery does not occur and the parents want to continue the pregnancy are rare and present a dilemma. Previous publications suggest that second trimester ROM may be associated with severe perinatal and neonatal morbidity such as fetal demise, premature labor and complications

related to prematurity, hypoplastic lungs, limb contractures, and significant maternal morbidity due to infection (Everest et al., 2008; Farooqi et al., 1998; Grisaru-Granovsky et al., 2003; Hibbard et al., 1993; Lindner et al., 2002; Pristauz et al., 2008; Shumway et al., 1999; Vergani et al., 1994; Verma et al., 2006; Yang et al., 2004). In Israel, termination of the entire pregnancy is the common practice in these circumstances. Other reported alternatives include selective termination of the fetus with leakage of amniotic fluid (De catte et al., 1998; Dorfman et al., 1995) and expectant management (Bakos et al., 1998; Borenstein & Shoham, 1990; De catte et al., 1998; Jazayeri et al., 2002; Wu et al., 1996). We present the outcome of nine bichorionic twin pregnancies with early ROM at 13–20 weeks, managed expectantly or by selective termination of the fetus with ruptured membranes.

Materials and Methods

Data regarding the period between January 2003 and July 2009 were collected retrospectively from obstetric and neonatal database and case records of three fetal medicine units (The Chaim Sheba Medical Center, Hadassah-Hebrew University Medical centers, The Baruch Padeh Medical Center Poria). Information regarding long term outcome was obtained directly from parents. This work was approved by the institutional review board of the Chaim Sheba medical center.

Diagnosis of ROM was made when a patient clearly complained of water leakage, a direct speculum examination revealed clear fluid in the vaginal vault, and ultrasound examination demonstrated significantly decreased amount of amniotic fluid in one sac. Gestational age was calculated as completed weeks

Received 29 April, 2010; accepted 26 August, 2010.

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Table 1
Pregnancies' Course and Outcome

Case no.	Maternal age	Pregnancy achieved by	Interventions or complications prior to ROM	Gest. age at ROM	ROM of twin A/B [†]	Intervention after ROM	Gest. age at delivery of a nonviable fetus	Gest. age at delivery of viable fetuses	ROM to delivery interval (wks)
1	37	IVF	Spontaneous reduction 3 > 2	13	B	Antibiotics, steroids AC for lower sac at 20w [‡]	—	29	16
2	23	IVF	—	14	A	Antibiotics, steroids, AC [§]	24 [¶]	32	18
3	25	IVF	Fetal reduction 4 > 2*	15	B	Steroids	—	27	12
4	25	EG+IUI	—	16	A	Selective reduction, antibiotics, steroids, cerclage	17	36	20
5	37	SP	AC for karyotype	18	B	Selective reduction, antibiotics	—	39	21
6	37	CC	AC for karyotype	19	B	Selective reduction, steroids	—	36	17
7	28	SP	—	19	A	Selective reduction, antibiotics	24	33	14
8	36	SP	AC for karyotype	19	B	Selective reduction, antibiotics	—	37	18
9	24	CC	—	20	B	Selective reduction, antibiotics	—	40	20

Note: IVF, In Vitro Fertilization; EG, Exogenous Gonadotropins; IUI, Intra Uterine insemination; SP, Spontaneous Pregnancy; CC, Clomiphene Citrate; AC, Amniocentesis

[†] A, lower sac; B, upper sac

[‡] Amniocentesis for lower sac was performed since the patient was a fragile X carrier.

[§] Amniocentesis was performed at 30 weeks due to fever, amnionitis was ruled out.

[¶] Twin A IUFD (Intra Uterine Fetal Death) at 17 weeks, spontaneous delivery at 24 weeks.

* Rupture of membranes occurred in one of the non reduced twins.

from the first day of the last menstrual period for spontaneous pregnancies, and as completed weeks from the ovulation day for pregnancies conceived after ovulation induction or in vitro fertilization (IVF). All couples received a comprehensive detailed consultation. In seven out of nine cases termination of pregnancy was recommended, according to the policy of all three fetal medicine units. Alternatives to this management were pointed out, including expectant management and selective termination. In the two most recent cases selective termination was recommended.

Observation was performed in hospital by fetal maternal staff. Maternal body temperature, leukocyte count and C reactive protein (CRP) were monitored for signs of chorioamnionitis, and fetuses went through serial ultrasound scans to evaluate growth, amount of amniotic fluids and possible fetal malformations. Women who went through selective termination were observed in hospital after the procedure, and were discharged from hospital when observation revealed no signs of infection. Out of nine patients seven received Betamethason at 24 weeks, seven received antibiotic therapy, and in one cerclage was performed at 19 weeks for cervical shortening (from 37 mm at admission to 26 mm).

Statistical analysis was performed using the independent *t* test. A *P* value < .05 was considered statistically significant.

Results

During the period studied, nine bichorionic twin pregnancies with early second trimester (13–20 weeks of gestation) ROM of one sac were diagnosed, in which spontaneous delivery did not occur and the parents elected not to terminate the pregnancy. All the couples requested to continue the pregnancy after a careful consideration of maternal and fetal risks and benefits. Three couples decided on expectant management and six couples preferred selective termination of the fetus with ruptured membranes. Of the latter group two cases (Table 1, cases no. 4 and no. 6) have been described previously (Keselman et al., 2008).

One woman (Table 1, case no. 1) was a fragile X carrier (66 repeats), and one (Table 1, case no. 2) had a family history of Protein S deficiency. Other women had unremarkable medical histories. Six women conceived after ovulation induction treatment or IVF. Rupture of membranes was spontaneous in five pregnancies, and followed invasive procedures in four (reduction from quadruplet to twins at seven weeks in one case, and amniocentesis for karyotype in three). Table 1 summarizes pregnancies' course.

Table 2

Neonatal Outcome

Case no.	Twin A/B*	Mode of delivery	Apgar score 1min/5min	Weight gr	Neonatal complications regarding early ROM†	Long-term outcome (age in months)
1	A	CS	3/9	1272	—	Normal (18 months)
	B	CS	5/10	980	Left knee contracture	Limited alignment – left knee. Walks normally (18 months)
2	B	NVD	8/10	1980	—	Normal (16 months)
3	A	CS	6/8	1065	—	Normal (18 months)
	B	CS	6/8	820	Limitation of hips abduction	Operation at age of 5 months for Unilateral dislocation of hip (18 months)
4	B	CS	9/10	2500	—	Normal (18 months)
5	A	NVD	9/10	3500	—	Normal (1 month)
6	A	NVD	8/9	2500	—	Normal (18 months)
7	B	CS	9/10	2200	—	Normal (6 months)
8	A	NVD	9/10	2850	—	Normal (1 month)
9	A	NVD	9/10	3100	—	Normal (1 month)

Note: CS, Cesarean section; NVD, Normal vaginal delivery.

* A, lower sac; B, upper sac

† Neonatal complication regarding early ROM includes: lung hypoplasia, limb contractures. Complications related to prematurity were not included.

The expectant management group included three women and six fetuses (Table 1, cases no. 1–3). In one case (Table 1, case 2) rupture of membranes occurred in the lower sac. The fetus in this sac died at 17 weeks and was spontaneously delivered at 24 weeks and a second viable fetus was delivered at 32 weeks gestation. In the other two cases (Table 1, case no. 1, case no. 3) rupture of membranes occurred in the upper sac. In these cases both twins survived, and were delivered at 27 and 29 weeks. Amniotic fluid leakage continued throughout pregnancy when expectant management was chosen, and did not re-accumulate.

Six women preferred selective feticide of the fetus with ruptured membranes; two of them had ROM of the lower sac and four had ROM of the upper sac. When ROM occurred in lower sac (Table 1, case no. 4, case no. 7) the terminated nonviable fetus was spontaneously delivered after the procedure (three days after termination in case no. 4 and four weeks after termination in case no. 7). The four patients with ruptured membranes of the upper sac had uneventful course after termination was performed and they delivered near term. Leakage of fluid usually stopped shortly after the procedure.

One woman (Table 2, case no.1) had clinical signs of amnionitis and cesarean section was performed. Maternal post-operative course was uncomplicated. Pathologic examination of the placenta did not reveal signs of inflammation. Another three women had cesarean deliveries (one for breech presentation of first

twin and two for fetal distress). The two survivors of ROM had minor limb contractures; none had hypoplastic lungs (Table 2). Five neonates who were delivered at 32 weeks gestation or before (Table 2, cases no. 1–3), suffered prematurity complications such as respiratory distress syndrome or transient tachypnea of newborn.

Comparing both groups for gestational age at delivery of viable fetuses show significant difference (mean 28.8 weeks vs. 36.2 weeks for expectant management versus selective reduction, independent *t* test, $p = .013$). Time interval between ROM and delivery (mean 15.3 vs. 19.3 weeks for expectant management versus selective reduction) was not significant.

Discussion

Early ROM is considered a complication with adverse fetal, maternal and neonatal outcome, and termination of pregnancy is commonly recommended for singletons as well as for twin pregnancies. In this study, we present nine women with bichorionic twins, who suffered early ROM. With expectant management take home baby rate was 83% (5 of 6 fetuses), delivered at 27–32 weeks gestation. When selective termination of the fetus with leaking fluids was performed, all six nonreduced co-twins survived and were delivered at 33–40 weeks. We found a significant difference between the groups in gestational age at delivery of viable fetuses, suggesting that intervention by selective feticide may have an advantage over

Table 3

Summary of Reported Cases of Bichorionic Twin Pregnancies Complicated by Very Early ROM of One Sac, and Managed Expectantly or by Selective Termination

	No. of cases	GA at ROM (twin A/B*)	Management	Outcome of fetus with ROM	Outcome of co-twin	Maternal complications
Borenstein et al. (1990)	1	15 wks (B)	Conservative	CS 32 wks, alive and well	CS 32 wks, alive and well	None
Dorfman et al. (1995)	1	15 wks (A)	Feticide	TOP	PS 39 wks	None
Wu et al. (1996)	1	19 wks (A)	Conservative	CS 29 wks, alive and well	CS 29 wks, alive and well	None
De catte et al. (1998)	8†	13–20 wks (8A)	Conservative	4 IUFD 4 neonatal death	3 alive and well delivered at 25, 29, 36 wks 5 fetal or neonatal death	No data
	3	13–16 wks (3A)	Feticide	3 TOP	1 PPROM and PS at 19 wks 2 alive and well delivered at 33, 38 wks	No data
Bakos et al. (1998)	1	13 wks (A)	Conservative	Prolapse of cord 21 wks, IUFD 23 wks followed by spontaneous delivery.	Chorioamnionitis, CS 28 wks. Discharged 10 wks later.	None
Jazayeri et al. (2002)	1	17 wks (A)	Conservative	Preterm delivery 18 wks	PS 32 wks alive and well	None
Present study	3	13–15 wks (2B, 1A)	Conservative	1 IUFD expulsion at 24 wks 2 alive and well delivered at 27, 29 wks	3 alive and well delivered at 27, 29, 32 wks	None
	6	16–20 wks (2A, 4B)	Feticide	6 TOP	6 alive and well delivered at 33, 36, 36, 37, 39, 40 wks	None
Total	25	13–20 wks (18A, 7B)	15 Conservative	11 did not survive 4 alive and well	5 did not survive 10 alive and well delivered 25–38wks	14 None 11 no data
			10 Feticide	10 TOP	1 did not survive 9 alive and well delivered 33–40 wks	

Note: CS, Cesarean Section; TOP, Termination Of Pregnancy; PS, Partus Spontaneous; IUFD, Intra Uterine Fetal Death; PPROM, Preterm Premature Rupture Of Membranes

* A, lower sac; B, upper sac; † Eight relevant cases out of nine published

expectant management. The time interval between ROM and delivery was not significant, probably due to the small number of cases. According to our data, however, ROM in bichorionic twins at 13–20 weeks gestation may have favorable prognosis whether an intervention is preformed or not, since neonates of both groups had normal long-term outcome.

As far as we know, 25 cases of twin pregnancies complicated by very early ROM of one sac and managed expectantly or by selective termination had been published in English literature (the present study included) (Table 3). The take-home baby rate of 83% in the expectant management group reported in our study is considerably higher than 18% (3/16) survival rate described by De Catte et al. in earlier case series (De Catte et al., 1998). In addition, two out of three

fetuses survived a ruptured sac in our group compared to none in their report. Our findings regarding prolongation of pregnancies in selective feticide group on the other hand, are comparable with De Catte et al. (1998).

Despite our good results, we believe that patients with bichorionic twin pregnancies complicated by ROM prior to 20 weeks should be consulted primarily on termination of pregnancy, since information regarding other management alternatives is based on small numbers. Whenever termination of pregnancy is not optional, either because of a very bad obstetric history, strict religious beliefs, or emotional reasons, selective termination or expectant management should be considered. Consultation with these couples should include not only potential risks in continuation of

pregnancy, but also the possibility to take home at least one healthy baby in these circumstances.

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