

# Expectant management of preterm premature rupture of membranes remote from term with exiguous amniotic fluid and a prolonged latency period: report of two cases

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## Summary

Management of preterm premature rupture of membranes (PPROM) is a very challenging issue for the obstetricians. We report two cases of PPRM occurring in early gestation remote from term (both < 26 weeks) with exiguous amniotic fluid (amniotic fluid index of  $\leq 2$  cm) that were managed successfully by conservative treatment and resulted in a latency period of almost two months. This treatment option might be feasible in carefully selected patients following meticulous evaluation and warrants further research.

**Key words:** Preterm premature rupture of fetal membranes; Amniotic fluid; Premature birth.

## Introduction

Preterm premature rupture of membranes (PPROM) refers to the spontaneous rupture of the membranes before the onset of labour before 37 weeks of gestation. Almost 3% of all pregnancies are complicated by PPRM [1]. PPRM occurs in one-third of all preterm births, and it is the most definitive cause of preterm birth [2]. PPRM can increase the incidence of perinatal infections, prematurity, pulmonary hypoplasia and umbilical cord compression or prolapse all of which can result in perinatal morbidity and mortality [3]. This condition may cause maternal infections and placental abruption [4]. PPRM that occurs at viability (23 weeks) up to 32 weeks of gestation is referred to using the term PPRM remote from term [1].

Herein, we report two patients with PPRM remote from term who were treated successfully with conservative expectant management with for almost two months at our institution.

## Case Reports

### Case 1

A 32-year-old patient (G2/P1; 23 3/7 weeks of gestation) was referred to our department due to amniotic fluid leakage. Her pregnancy history was uneventful. Some amniotic fluid was seen at the posterior fornix without cervical dilation on sterile speculum examination. The Amnisure test (N-Dia Inc. New York, NY) was positive. An ultrasound (US) scan revealed a 23-week fetus with an estimated weight of 595 g and an amniotic fluid index (AFI) of  $\leq 2$  cm. Cervical length was measured as 39 mm without evidence of funnelling. Upon admission, blood leukocyte count and C-reactive protein (CRP) levels were within normal limits (9.9  $10^3/\text{mm}^3$  and 0.35 mg/dl, respectively). No pathogen was detected in cultures or gram staining of urine and cervical-vaginal samples for Group B *Streptococcus*, *Chlamydia* and *Gonorrhoea*. The patient was informed about the benefits and risks of conservative-expectant management and was hospitalised

for bed rest. Parenteral antibiotic treatment with ampicillin (2 g every six hours for 48 hours) and intravenous serum (isolyte) were initiated. Thereafter, parenteral antibiotics were replaced with oral amoxicillin (250 mg every 8 hours for 5 days). Daily fetal cardiotocography and daily maternal blood pressure, pulse rate and body temperature were checked. A maternal US scan and blood tests (leukocyte count and CRP) were carried out twice weekly. Amniotic fluid leakage was present every day until birth. After 55 days of conservative-expectant management (31 1/7 weeks gestation), premature contractions began without any sign of amnionitis. Tocolysis and a course of betamethasone were initiated immediately. However, contractions continued and a cervical dilatation of 2 cm was detected. Due to variable decelerations the baby was delivered by caesarean section. A baby girl with a birth weight of 1,610 g (10-50<sup>th</sup> percentile), length of 41 cm (10-50<sup>th</sup> percentile), head circumference of 27 cm (10<sup>th</sup> percentile) and 1- and 5-min Apgar scores of 6 and 8, respectively, was hospitalised in the neonatal intensive care unit (NICU). After 42 days of treatment (3 weeks before the calculated delivery date), the infant was discharged at a weight of 2,050 g (3-10<sup>th</sup> percentile).

### Case 2

A 40-year-old patient (G1/P0; 25 6/7 weeks gestation) was referred to our department due to PPRM. US demonstrated a 26-week foetus with an estimated weight of 858 g and an AFI of  $\leq 2$  cm. Cervical length was 40 mm without funnelling or cervical dilatation. The vagina was wet with amniotic fluid upon speculum examination. Cervical-vaginal cultures were negative. Blood tests and urine analysis were within normal limits. Similarly, the patient was treated with conservative-expectant management as explained above with the same protocol. AFI was detected to be < 2 cm throughout the pregnancy. In the 32<sup>nd</sup> gestational week, a single course of betamethasone was administered. At the follow-up, the estimated weight of the fetus remained the same with an increased umbilical artery resistance index (RI) of 0.76. At 34 1/7 weeks of gestation (after 59 days of hospital stay with prolonged PPRM), a caesarean section was performed due to breech presentation. A baby boy with a birth weight of 1,760 g (10<sup>th</sup> percentile), length of 43 cm (10-50<sup>th</sup> percentile), head circumference of 30 cm (10-50<sup>th</sup> percentile) and 1- and 5-min Apgar scores of 7 and 9, respectively, was delivered. Likewise, the baby was hospitalised in the NICU. After 28 days of treatment (2 weeks before the calculated delivery date), the infant was discharged with a weight of 2,346 g (3<sup>rd</sup> percentile).

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## Discussion

Conservative management of PPRM includes modified bed rest, foetal and maternal monitoring (including nonstress test, body temperature, tachycardia, and the presence of uterine tenderness), evaluation of haematological tests (blood leukocytes and CRP) and US scans. Modified bed rest is necessary to improve the AFI and chance of spontaneous sealing of the membranes. In our protocol, foetal monitoring was performed daily to ensure foetal well-being and to provide knowledge about foetal distress, umbilical cord compression and premature uterine contractions [1]. Nonetheless, continuous external foetal heart rate monitoring does not seem feasible in patients with PPRM undergoing expectant management [5]. US scans should also be performed at least weekly to determine the AFI, Doppler blood flow and foetal weight gain [1]. It is suggested to give broad-spectrum antibiotics starting with IV therapy for 48 hours (ampicillin 2 g IV every 6 hours) followed by five days of oral therapy (amoxicillin 250 mg every 8 hours) [6]. In cases with an allergy to penicillin, macrolide antibiotics should be chosen. Previous studies [7] have shown that antibiotic therapy may increase the latency period by more than one week and reduce the risk of amnionitis, neonatal sepsis, respiratory distress syndrome and intra-ventricular haemorrhage. If amnionitis is suspected, amniocentesis can help in detecting whether an infection is present. The amniotic fluid can be checked for lowered glucose concentrations, elevated interleukin levels [8], a positive Gram stain or a positive amniotic culture. Although elevated CRP is associated with histologic chorioamnionitis, there is not enough data to support its use as an early predictor of chorioamnionitis; however, serial measurements of CRP could be promising [9].

The goal of treatment for PPRM remote from term is to prolong the delivery of the foetus until after 32-34 weeks of gestation, because the risk of neonatal complications noticeably declines thereafter [10]. Unfortunately 50-60% of women with PPRM remote from term deliver within one week of the rupture of the membranes [11]; only a few of these women will continue their pregnancy for more than a week. Studies of parameters that affect the latency period offer conflicting findings. The AFI is one of the most important predictors of latency. Previously, it has been shown that women with a residual AFI of  $\leq 5$  cm usually have a shorter interval period between PPRM occurrence and delivery, and they also have an increased risk of chorioamnionitis [12].

A shorter interval of latency for PPRM of  $< 30$  weeks of gestation is related to increased infant mortality [13]. Additionally, if the foetus survives after PPRM, the neonatal outcomes may improve. In this case, elective delivery could be associated with improved neonatal outcome compared to spontaneous labour [14]. In both of our cases, the time interval between PPRM and delivery was almost two months (55 and 59 days) despite the AFI of  $\leq 2$  cm. This strategy provides time for foetal maturation and lung development. To avoid the possible complications during the latency period (e.g., sponta-

neous onset of labour, infection, abruption placenta and foetal distress), close monitoring of both the mother and foetus should be performed.

In summary, we have reported two cases of PPRM occurring in early gestation remote from term with exiguous amniotic fluid that were managed successfully by conservative treatment and resulted in a latency period of almost two months. Although our experience is very limited (i.e., just two patients), our approach includes close follow-up and treatment. This treatment option might be feasible in carefully selected patients following meticulous evaluation and warrants further research.

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