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Management of Preterm Premature Rupture of Membranes (PPROM) at 22 Weeks: Conservative or Termination? A Case Report

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ABSTRACT

Introduction: Preterm premature rupture of membranes (PPROM) is an obstetrics condition that outcomes can vary significantly depending on gestational age. Significant maternal and fetal complications may arise, including premature birth, infection, placental abruption, cord prolapse, pulmonary hypoplasia, and even death. PPROM at 22 weeks of gestation is a rare condition that carries a high risk of morbidity and mortality.

Case Presentation: Mrs. YS, 29 years old, G2P0A1, with a gestational age of 22-23 weeks, singleton live intrauterine, has experienced PPROM. At the beginning of her admission, termination was recommended; however, the patient declined and desired to continue the pregnancy. Consequently, a conservative management approach was implemented. The patient was prescribed antibiotic therapy, lung maturation, and monitored for signs of chorioamnionitis. A male baby was born via cesarean section at 28-29 weeks of gestational age due to suspected chorioamnionitis, weighing 850 grams. The baby received treatment with CPAP and antibiotics but passed away after two weeks.

Discussion: Conservative management can prolong pregnancy and improve neonatal survival chances, but it carries a high risk of maternal infection, sepsis, and complications related to prematurity. Meanwhile, termination of pregnancy is more commonly performed in cases with poor neonatal prognosis or when there are medical indications that threaten the mother's safety.

Conclusion: The decision between conservative management and termination in cases of PPROM at 22 weeks of gestation must consider fetal prognosis, maternal risks, and the readiness of medical facilities. Comprehensive counseling for the patient and family is crucial in the decision-making process.

INTRODUCTION

Preterm premature rupture of membranes (PPROM), defined as membrane rupture occurring before 37 weeks of gestation, affects 1-4% of pregnancies and is associated with high rates of perinatal morbidity and mortality. Infants in cases of PPROM face increased risks of obstetric complications (such as placental abruption, umbilical cord prolapse, and infection) as well as fetal complications (including pulmonary hypoplasia, limb deformities, prematurity, and in-utero

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death), leading to both short-term and long-term adverse effects.(Challacombe et al., 2024; Lorthe et al., 2018)

Periviable PROM occurs in less than 1% of pregnancies, specifically between 14 and 24 weeks of gestation. (Goodfellow et al., 2024) Clinical experience and research on expectant management in these cases remain limited. Variability in clinical care, including decisions regarding termination or conservative management, can heighten emotional stress for parents. Periviable PROM carries a high risk of severe complications, such as chorioamnionitis, fetal loss, and extreme prematurity. Medical decisions regarding PROM before the viability threshold are complex and ethically challenging, with survival rates varying (37,5%) due to differences in management practices across countries. Previous studies indicate that infants born at 22-23 weeks typically receive palliative care, as resuscitation limits are often set at ≥24 weeks.(Sorano et al., 2020)

The American College of Obstetricians and Gynecologists states that "immediate delivery and expectant management should be offered," and patients should receive information on how management decisions impact their health and that of their fetus. (Sklar et al., 2022) Counseling for pregnancies experiencing PPROM before or at the viability threshold aims to facilitate shared decision-making; however, current evidence limitations hinder the accuracy of the information provided.(Sorrenti et al., 2024)

CASE PRESENTATION

Patient Mrs. YS, 29 years old, G2P0A1, with a gestational age of 22-23 weeks, singleton live intrauterine, has experienced premature rupture of membranes with clear amniotic fluid and odorless. At the beginning of her admission, termination was recommended; however, the patient declined and desired to continue the pregnancy. Consequently, a conservative management approach was implemented.

The patient attends regular antenatal care (ANC) to the obstetrician. The patient has a history of undergoing a hysterotomy at 20 weeks of gestation, performed 10 months ago, due to impending eclampsia. Unfortunately, the baby passed away one day after birth. Important maternal factors to consider include gestational diabetes, for which she has been receiving insulin therapy to manage her blood glucose levels. The patient's blood glucose levels are effectively controlled with insulin. The patient has a history of vaginal discharge at the beginning of her pregnancy, characterized by itching and a slight fishy odor, which suggests bacterial vaginosis but has not received any medication for this condition.

Physical examination findings revealed that the patient exhibits a BMI classified as overweight (BMI: 29,4 kg/m^2), has gained 4 kg during pregnancy, has stable vital signs, and maintains a normal general status. The obstetric examination indicates a fundal height consistent with gestational age. Irregular contractions are noted; however, the fetal heart rate remains normal, suggesting adequate fetal well-being. A sterile speculum exam confirmed fluid leakage from the cervical os. The Valsalva test was positive, with pooling observed at the posterior fornix and a positive nitrazine test. Laboratory results indicate normal levels of hemoglobin, leukocytes, and platelets. Elevated fasting and postprandial glucose levels (166 mg/dL and 412 mg/dL), along with an HbA1c of 7.5%, confirm the diagnosis of gestational diabetes. CRP was negative in the first examination. Ultrasound findings revealed that the baby was in good condition, although no remaining amniotic fluid was detected. The patient was prescribed antibiotic therapy (Ampicillin 1 g intravenously every 6 hours and Erythromycin 250 mg orally every 8 hours), along with lung maturation treatment, and was monitored for signs of chorioamnionitis infection. The patient was hospitalized for two weeks and discharged with stable hemodynamic and blood glucose levels,

showing no clinical or laboratory signs of chorioamnionitis; an ultrasound examination revealed that the single deep pocket of amniotic fluid measured 1.04 cm. The patient was followed up twice at the polyclinic and received education on monitoring fetal movement and signs of chorioamnionitis, including fever, tachycardia, abdominal pain, and foul-smelling fluid discharge.

The patient returned at 28-29 weeks of gestational age to the emergency room with symptoms of irregular contractions. During a one-day observation in the delivery suite, the patient reported abdominal pain, fever, and foul-smelling fluid discharge. CRP was positive, and an elevated fetal heart rate indicated fetal tachycardia. The patient suspected a possible infection (chorioamnionitis). Consequently, the decision was made to perform a cesarean section. A male baby was born at 28-29 weeks of gestational age due to suspected chorioamnionitis, weighing 850 grams, with no amniotic fluid present. The baby was treated in NICU Level 3 and diagnosed with neonatal sepsis, very low birth weight, and classified as a preterm neonate. The baby received treatment with CPAP and antibiotics but passed away after two weeks. The mother was hospitalized for three days after the c-section and was discharged with stable hemodynamic and blood glucose levels, showing no clinical or laboratory signs of surgical infection. The patient was also monitored at the polyclinic twice and showed good recovery.

DISCUSSION

Premature rupture of membranes in preterm pregnancy is a condition that can significantly affect maternal and neonatal morbidity and mortality. In this case, Mrs. YS, a 29-year-old woman with a singleton pregnancy at 28-29 weeks, has experienced PPROM for one month, accompanied by severe oligohydramnios, chorioamnionitis, and gestational diabetes. This situation presents clinical challenges in making optimal management decisions. Close monitoring and a multidisciplinary approach are essential to ensure the best outcomes for the mother and fetus.

Preterm premature rupture of membranes (PPROM) is defined as membrane rupture occurring before 37 weeks of gestation. Patients with ruptured membranes typically report fluid leakage from the vagina, with or without uterine contractions. Clinical assessment includes evaluating contractions, bleeding, fetal movement, and amniotic fluid characteristics to detect infection or meconium. A sterile speculum examination confirms fluid leakage from the cervical os, while a digital examination is avoided to prevent infection. The diagnosis of PROM can be confirmed through three main clinical signs: 1) Pooling of fluid in the posterior fornix (pooling sign) or flows from the cervical canal, especially during the Valsalva maneuver, 2) Nitrazine test, which is positive if it turns blue (amniotic fluid pH is 7.0 to 7.5), and 3) Ferning test, which shows a fern-like pattern of dried amniotic fluid under a microscope. Additional evaluations, including obstetric ultrasound, cardiotocography (CTG), and laboratory tests, are performed to assess fetal well-being and the risk of maternal infection. (Andalas et al., 2019; Dayal et al., 2024; Garg & Jaiswal, 2023) In Ms. YS's case, physical and supportive examinations confirmed a diagnosis of premature rupture of membranes (PPROM) with the fetus in good condition and no signs of infection.

The management of preterm premature rupture of membranes depends on gestational age. For patients at 34-36 weeks, a single course of corticosteroids is recommended for those at risk of preterm delivery within 7 days and without prior corticosteroid treatment, provided labor induction or delivery is planned within 24 hours to 7 days. Immediate delivery is warranted for positive Group B Streptococcus (GBS), while expectant management may be considered for negative or unknown GBS results. For patients at 24-33 weeks, expectant management is recommended if there are no maternal or fetal contraindications, including the administration of

antibiotics, corticosteroids, GBS prophylaxis, and magnesium sulfate for neuroprotection. To reduce maternal and neonatal infections, latency antibiotics should be administered for 7 days. This should include a combination of intravenous ampicillin and erythromycin, followed by oral amoxicillin and erythromycin. At less than 24 weeks, the decision between termination or expectant management depends on maternal risks and fetal prognosis. Comprehensive counseling should be provided, considering the readiness of medical facilities and the patient and family's preferences. Thus, conservative management was deemed appropriate for the patient in this case.(ACOG., 2020; Espinoza et al., 2020; Garg & Jaiswal, 2023; Thomson, 2019)

PPROM has a complex and multifactorial etiology, including chorioamnionitis, collagen degradation, membrane defects, uterine distension, and programmed cell death of amniotic cells. Infection plays a significant role, with microorganisms such as Group B Streptococcus and bacterial vaginosis increasing the risk of PPROM through the production of prostaglandins and inflammatory mediators like matrix metalloproteinases (MMPs), which weaken the membranes. (Berghella, 2017)

Termination of pregnancy for medical reasons can be performed immediately or following expectant management, with the main indications being severe chorioamnionitis, sepsis, or the patient's decision based on a poor maternal and neonatal prognosis. Chorioamnionitis is a condition in which the chorion, amnion, and amniotic fluid become infected with bacteria. A history of urinary tract infections is an obstetric and gynecological predictor of premature rupture of membranes. (Goodfellow et al., 2024) The risk of termination without expectant management tends to decrease as gestational age increases when PPROM occurs. Meanwhile, in pregnancies managed expectantly, the median time from PPROM to delivery is 13 days, with the highest risk of delivery occurring within the first seven days after PPROM, gradually decreasing thereafter. (Goodfellow et al., 2024)

At gestational ages less than 24 weeks with preterm premature rupture of membranes (PPROM), minor neonatal morbidities, such as hyperbilirubinemia and transient tachypnea, are more prevalent when mothers give birth at this age compared to those who deliver at 36 weeks. Significant morbidities, such as respiratory distress syndrome and intraventricular hemorrhage, do not show substantial differences. Current research suggests that maintaining the pregnancy is a better option. (Obstetri et al., 2016) Maintaining the pregnancy until full term can be challenging due to the risk of infection, especially in resource-limited settings where access to and availability of medical resources are restricted. From a maternal perspective, sepsis is a more frequent complication in twin pregnancies and in patients with cervical cerclage. Additionally, surgical intervention for placenta removal is often required.

The rate of live births increases with advancing gestational age at the time of PPROM. However, survival until hospital discharge varies significantly, with a median length of stay of 59 days (Jena et al., 2022). Perinatal outcomes for PPROM occurring before 24 weeks of gestation are particularly poor, with perinatal mortality rates ranging from 60% to 90%. Approximately 50% of affected mothers may develop chorioamnionitis, and the same proportion may require cesarean delivery. Additionally, 6.8% of cases may experience placental abruption. A study conducted at RSUDZA revealed a significant correlation between premature rupture of membranes (PROM) and low birth weight (LBW) regarding neonatal survival rates. Infants weighing less than 1000 grams exhibited a survival rate of 0%, highlighting their extreme vulnerability. Conversely, those in the 1000 to 1500 grams category had a survival rate of 55%, while infants weighing between 1500 and 2500 grams demonstrated a substantially higher survival rate of 95% (Wijaya & Darussalam, n.d.). Among the infants who survive, 16% are at risk of severe long-term complications. Prolonging the latent period by two weeks or more is

associated with improved outcomes for mothers and infants. Some patients can extend their pregnancies for several weeks following PROM without signs of infection; however, these patients face an elevated risk of fetal musculoskeletal deformities and pulmonary hypoplasia, particularly if the duration of PROM exceeds four weeks (Arias et al., 2008).

No management approach has proven effective in improving outcomes for these pregnancies. For pregnancies under 24 weeks, mothers should be offered the option of labor induction to deliver the fetus and minimize potential complications. If parents choose termination, it is essential to communicate that there is a 10–20% chance the fetus may be born alive. Parents should understand that the neonatologist's evaluation will determine the decision to provide full neonatal support rather than solely relying on the parents' wishes regarding termination. If the patient chooses not to terminate and instead opts for expectant management, she will receive treatment with tocolytics, glucocorticoids, and antibiotics. For pregnancies under 24 weeks, the patient may be discharged and then readmitted for continued expectant management once she reaches 24 weeks. (Arias et al., 2008)

Management of preterm premature rupture of membranes (PPROM) at 22 weeks of gestation can be either conservative or result in termination, depending on the condition of the mother and fetus. A conservative approach is taken if there are no signs of intra-amniotic infection, placental abruption, cord prolapse, or fetal distress. This management includes hospitalization with close monitoring for signs of infection, administration of latency antibiotics to prolong the pregnancy, and corticosteroids if the gestational age approaches viability. Neuroprotective magnesium sulfate is not recommended before 24 weeks. However, the primary risks of expectant management include maternal sepsis, bleeding, and the birth of infants with severe neurological complications due to extreme prematurity. Therefore, termination may be considered, especially in cases of severe infection or worsening maternal conditions. Data indicate that neonatal survival in PPROM before 24 weeks is very low, with significant morbidity rates. Consequently, the decision between conservative management and termination should be based on the fetal prognosis, the readiness of medical facilities, and the preferences of the patient and family through comprehensive counseling. (Dayal et al., 2024; Sklar et al., 2022)

CONCLUSION

The case of Ms. YS illustrates the complexities involved in managing PPROM. Her history of gestational diabetes, chorioamnionitis, and oligohydramnios complicates her condition. Survival rates for neonates with PROM vary significantly, necessitating an individualized approach that considers both maternal and fetal factors to determine optimal interventions. Women with a history of PROM are at significant risk for recurrence, making preventive measures essential, such as avoiding infections, maintaining proper hygiene, and addressing other factors that could lead to PROM. Effective management, including antibiotic administration, close monitoring, and preparedness for neonatal resuscitation, is crucial for improving pregnancy and neonatal outcomes.

REFERENCES

ACOG PRACTICE BULLETIN Clinical Management Guidelines for Obstetrician-Gynecologists Prelabor Rupture of Membranes. (2020). http://journals.lww.com/greenjournal

Andalas, Mohd., Maharani, C. R., Hendrawan, E. R., Florean, M. R., & Zulfahmi, Z. (2019). Ketuban pecah dini dan tatalaksananya. *Jurnal Kedokteran Syiah Kuala*, *19*(3). https://doi.org/10.24815/jks.v19i3.18119

Arias, F., Bhide, A., S, A., Damania, K., & Daftary, S. (2008). Practical Guide to High Risk Pregnancy and Delivery. *Elsevier*, 323–357.

Berghella, V. (2017). *Obstetric Evidence Based Guidelines third edition*.

Challacombe, F. L., Suchomelova, Z., Zampieri, C., Hall, M., Curran, C., Shennan, A., & Story, L. (2024). Preterm premature rupture of the membranes (PPROM): a study of patient experiences and support needs. *Journal of Reproductive and Infant Psychology*. https://doi.org/10.1080/02646838.2024.2314179

Dayal, S., Jenkins, S. M., & Hong, P. L. (2024). Preterm and Term Prelabor Rupture of Membranes (PPROM and PROM). *StatPearls*. https://www.ncbi.nlm.nih.gov/books/NBK532888/

Espinoza, J., Vidaeff, A., Pettker, C. M., & Simhan, H. (2020). *ACOG PRACTICE BULLETIN Clinical Management Guidelines for Obstetrician-Gynecologists*.

Garg, A., & Jaiswal, A. (2023). Evaluation and Management of Premature Rupture of Membranes: A Review Article. *Cureus*. https://doi.org/10.7759/cureus.36615

Goodfellow, L., Care, A., Curran, C., Roberts, D., Turner, M. A., Knight, M., & Zarko, A. (2024). Preterm prelabour rupture of membranes before 23 weeks' gestation: prospective observational study. *BMJ Medicine*, *3*(1), e000729. https://doi.org/10.1136/bmjmed-2023-000729

Jena, B. H., Biks, G. A., Gete, Y. K., & Gelaye, K. A. (2022). Incidence of preterm premature rupture of membranes and its association with inter-pregnancy interval: a prospective cohort study. *Scientific Reports*, *12*(1). https://doi.org/10.1038/s41598-022-09743-3

Lorthe, E., Torchin, H., Delorme, P., Ancel, P. Y., Marchand-Martin, L., Foix-L'Hélias, L., Benhammou, V., Gire, C., d'Ercole, C., Winer, N., Sentilhes, L., Subtil, D., Goffinet, F., & Kayem, G. (2018). Preterm premature rupture of membranes at 22–25 weeks' gestation: perinatal and 2-year outcomes within a national population-based study (EPIPAGE-2). *American Journal of Obstetrics and Gynecology*, *219*(3), 298.e1-298.e14. https://doi.org/10.1016/j.ajog.2018.05.029

Obstetri P, Indonesia G, Kedokteran H, Maternal F. Pedoman Nasional Pelayanan Kedokteran Ketuban Pecah Dini. 2016. . (n.d.).

Sklar, A., Sheeder, J., Davis, A. R., Wilson, C., & Teal, S. B. (2022). Maternal morbidity after preterm premature rupture of membranes at <24 weeks' gestation. *American Journal of Obstetrics and Gynecology*, *226*(4), 558.e1-558.e11. https://doi.org/10.1016/j.ajog.2021.10.036

Sorano, S., Fukuoka, M., Kawakami, K., & Momohara, Y. (2020). Prognosis of preterm premature rupture of membranes between 20 and 24 weeks of gestation: A retrospective cohort study. *European Journal of Obstetrics and Gynecology and Reproductive Biology: X*, *5*. https://doi.org/10.1016/j.eurox.2019.100102

Sorrenti, S., Mascio, D. Di, Khalil, A., D'antonio, F., Rizzo, G., Zullo, F., D'alberti, E., D'ambrosio, V., Mappa, I., Muzii, L., & Giancotti, A. (2024). Outcome of prelabor rupture of membranes before or at the limit of viability: systematic review and meta-analysis. *American Journal of Obstetrics & Gynecology MFM*, *6*, 101370. https://doi.org/10.1016/j

Thomson, A. J. (2019). Care of Women Presenting with Suspected Preterm Prelabour Rupture of Membranes from 24+0 Weeks of Gestation: Green-top Guideline No. 73. *BJOG: An International Journal of Obstetrics and Gynaecology*, *126*(9), e152–e166. https://doi.org/10.1111/1471-0528.15803

Wijaya, D., & Darussalam, D. (n.d.). *The Impact of Premature Rupture of Membranes (PROM) and Low Birth Weight (LBW) Infant Outcomes to the Survival Rate Hubungan Ketuban Pecah Dini (KPD) dengan Luaran Bayi Berat Badan Lahir Rendah (BBLR) terhadap Survival rate setelah Satu Minggu Dilahirkan*.