

ANMC WOMEN'S HEALTH SERVICE PRETERM PREMATURE RUPTURE OF MEMBRANES

1. Definition:

Rupture of the membranes prior to 37 weeks gestation and prior to the onset of labor.

(To be distinguished from “premature rupture of membranes” prior to the onset of labor at term, and from premature rupture of membranes without labor prior to viability at 23-24 weeks, which is most commonly associated with “hour-glassing” of the membranes secondary to cervical insufficiency.)

a. Associations with PPROM:

-same as for preterm birth above, current theory is that PPROM is the result of occult infection at the choriodecidual interface with production of microbial collagenases resulting in membrane rupture.

Midtrimester PPROM: KEY POINTS

- Midtrimester PPROM is associated with the same risk factors at PPROM later in gestation
- Mean latency is 17 days, median latency is 7 days because the majority of pregnancies deliver soon after rupture of membranes
- The frequency of chorioamnionitis is higher early in the latency period and at lower residual amniotic fluid volumes
- Abruptio placentae and cord prolapse are more common in pregnancies complicated by PPROM
- Neonatal survival is primarily related to gestational age at delivery, and is comparable to that in preterm deliveries matched for gestational age without PPROM.
- The neonatal risk of both pulmonary hypoplasia and musculoskeletal deformation decrease with advancing gestational age, shorter latency, and greater residual amniotic fluid volume.
- Maternal risks from midtrimester PPROM are lower than fetal/neonatal risks and include infection, need for cesarean delivery, and need for classical hysterotomy.
- Absence of amniotic fluid leakage associated with resealing of membranes and reaccumulation of amniotic fluid confers a prognosis comparable to that of pregnancies without PPROM.

Corticosteroids

A single course of corticosteroids is recommended for pregnant women between 23 weeks and 34 weeks of gestation who are at risk of preterm delivery within 7 days.

'Rescue' Steroids

A single course of 'rescue' therapy is reasonable if the patient is clinically estimated to be at high risk of delivery within the next seven days, at least two weeks have passed since the initial course of antenatal corticosteroids, and the initial course was given at

<28 weeks of gestation. However, regularly scheduled repeat courses or multiple courses (more than two) are not recommended.

Antibiotics

There are 3 separate indications to give antibiotics in this setting:

- GBS prophylaxis
- prolong latency period
- treat overt chorioamnionitis

2. Management:

Review pregnancy dating criteria

Perform sterile speculum examination for evidence of amniotic fluid

Refrain from performing a digital examination unless absolutely necessary to document advanced labor prior to transport. (Remember that if you can visualize a portion of the presenting part, the cervix is most likely significantly effaced and dilated at least 4 cm, but if it appears “closed” it may be any dilation <4cm...)

Digital examination “winds the clock of infection” and significantly decreases the latency period for the onset of labor, and increases the risk of infection, and is to be avoided in this setting if at all possible.

Confirm presentation by Leopold’s and/or ultrasound

Perform level I ultrasound to assess GA, EFW, AFI, presentation, and anatomy

A sample of vaginal pool amniotic fluid for fetal lung maturity testing may be appropriate if the patient is between 34 and 36 weeks gestation

Obtain fetal monitor strip and maternal vital signs

Administer group B strep prophylaxis per guideline

Tocolysis (see above) may be appropriate to facilitate transport, but is otherwise not indicated

Consult with OB-GYN is advised for further management and transport

At ANMC PPRM is managed as an inpatient*

Daily NST should be carried out

Maternal temperature and fetal heart rate are monitored q4h, but the onset of uterine contractions is the most common sign of incipient infection. Overt chorioamnionitis mandates delivery.

Labor may be induced at 34 weeks documented gestation, or sooner with consultation with the Pediatrics service

Patients may be induced with either vaginal or oral misoprostol or IV oxytocin

Group B strep prophylaxis should be re-instituted in labor

If chorioamnionitis is suspected, gentamicin 2 mg/kg IV q8h should also be administered to cover gram negative pathogens

Patients with rupture of membranes **at term** who are not in labor have a better outcome without an increase in their cesarean birth rate if induced as soon as they present.

*In cases of extreme prematurity, expectant management should be individualized. There is 2B data to support antibiotic prophylaxis at 23-24 weeks. The data is only 2C from 20-23 wks. Please consult with either MFM or Neonatology.

(Please see ACOG/STFM Consensus Summary: Previabile Birth)

EGA < 34 weeks

Step 1

If less than 23-34 weeks gestation, administer
Betamethasone (12 mg) given intramuscularly 24 hours apart for two doses
or
Dexamethasone (6 mg) given intramuscularly every 12 hours for four doses

Step 2

If GBS status is unknown, obtain a rectovaginal GBS specimen and for 48 hrs
administer:

Ampicillin 2 gm IV q 6 hours X 48 hrs

If penicillin allergy is reported, but it is not urticaria or anaphylaxis, the drug of
choice is then cefazolin (1 g IV q8h x 48 hrs), not clindamycin. This is followed
by cephalexin 500 mg orally four times daily for five days.

plus

Azithromycin 500 mg IV q 24 hr x 48 hrs

If erythromycin allergy is reported, cross-reactivity with azithromycin should likewise
be uncommon.

Step 3

To increase the latency period **after 48 hrs**, administer azithromycin 250 mg daily
orally for an additional 5 days

Plus

Amoxicillin (500 mg orally three times daily or 875 mg orally twice daily) for an
additional 5 days

Use of Magnesium Sulfate for Fetal Neuroprotection

Women with preterm premature rupture of membranes at **26*- 32 weeks**
gestation who are expected to deliver within the next 24 hours are eligible for
magnesium sulfate for fetal neuroprotection

-upon diagnosis
-in active labor

Exclusion:

Women who have not delivered within 12 hours of admission for PPRM.

1. A loading dose of magnesium sulfate 6 g IV over 20 minutes should be given.
2. A maintenance dose of magnesium sulfate of 2 g/h should be continued for 12
hours.

3. Other orders for antenatal corticosteroids, and group B strep prophylaxis as per guideline.
4. The infusion should be stopped at 12 hours if delivery has not occurred.
5. If delivery is again considered imminent (resumption of active labor and cervix >4 cm dilated) within 12 hours after the infusion has been discontinued, a repeat 6 g bolus is suggested and the infusion may be resumed at 2 g/h. The total length of maternal exposure should be less than 24 hours, even if magnesium sulfate is given in divided doses.
6. ≤ 25 wks: only give 4 gm bolus and 1 gm per hour*

Rescue Steroids

A single course of 'rescue' therapy < 34 wks is reasonable if the patient is clinically estimated to be at high risk of delivery within the next seven days, and at least two weeks have passed since the initial course of antenatal corticosteroids. However, regularly scheduled repeat courses or multiple courses (more than two) are not recommended.

Management of Late Preterm (> 34 wk < 37 wks)

1. In women with a singleton pregnancy between 34 weeks 0 days -36 weeks 6 days of gestation who are at high risk for PTB within the next 7 days (but before 37 weeks of gestation), we recommend treatment with betamethasone (two doses of 12 mg IM twenty four hours apart).
2. In women with preterm labor symptoms in the late preterm (LPT) period, please wait for evidence of preterm labor, such as a cervical dilatation of at least 3 cm or effacement of at least 75%, before treatment with betamethasone.
3. Late preterm antenatal corticosteroid administration should NOT be used in women diagnosed with chorioamnionitis.
4. Administration of late preterm antenatal corticosteroids should NOT be given if the pregnancy was already exposed to antenatal corticosteroids.
5. In women with LPT pregnancies receiving betamethasone, please avoid the use of tocolysis in an attempt to delay delivery to complete the steroid course since it is unclear if the benefits of betamethasone administration are outweighed by the risks of attempts to delay delivery.
6. In women with LPT pregnancies with a potential medical indication for delivery, betamethasone need not be given unless there is a definitive plan for LPT delivery.
7. These recommendation exclude patients with:
Pregestational diabetes, multifetal gestations, previous exposure to steroids during this pregnancy, or pregnancies with one major or two minor non-lethal fetal malformations.
(see Appendix 1)

Summary of recommendations

The following recommendations and conclusions are based on good and consistent scientific evidence (**Level A**):

- Patients with PROM before 34 0/7 weeks of gestation should be managed expectantly if no maternal or fetal contraindications exist.
- To reduce maternal and neonatal infections and gestational-age dependent morbidity, a 7-day course of therapy with a combination of erythromycin and ampicillin or amoxicillin is recommended during expectant management of women with preterm PROM who are less than 34 0/7 weeks of gestation.
- Women with preterm PROM and a viable fetus who are candidates for intrapartum GBS prophylaxis should receive intrapartum GBS prophylaxis to prevent vertical transmission regardless of earlier treatments.
- A single course of corticosteroids is recommended for pregnant women between 24 0/7 wks and 34 0/7 wks, and may be considered for pregnant women as early as 23 0/7 wks who are at high risk of preterm delivery within the next 7 days.
- Women with preterm PROM before 32 0/7 weeks of gestation who are thought to be at risk of imminent delivery should be considered candidates for fetal neuroprotective treatment with intravenous magnesium sulfate.

The following recommendations and conclusions are based on limited and inconsistent scientific evidence (Level B):

- A single course of repeat antenatal corticosteroids should be considered in women whose prior course of antenatal corticosteroids was administered at least 7 days previously and who remain at risk of preterm birth before 34 weeks of gestation.
- For women with PROM at 37 0/7 weeks of gestation or more, if spontaneous labor does not occur near the time of presentation in those who do not have contraindications to labor, labor should be induced.
- At 34 0/7 weeks or greater gestation, delivery is recommended for all women with ruptured membranes.
- In the setting of ruptured membranes with active labor, therapeutic tocolysis has not been shown to prolong latency or improve neonatal outcomes. Therefore, therapeutic tocolysis is not recommended.

The following conclusion is based primarily on consensus and expert opinion (Level C):

- The outpatient management of preterm PROM with a viable fetus has not been sufficiently studied to establish safety and, therefore, is not recommended.

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Appendix 2 (See Table 1 and Table 2)

Table 1: Major Fetal Anomalies / Congenital Malformations

(Need one major anomaly for exclusion)

Pulmonary

Congenital diaphragmatic hernia (CDH)
Congenital cystic adenomatoid malformation
Pleural effusions
Chylothorax
Bronchogenic cyst
Bronchopulmonary sequestration

Cardiac

Anomalous pulmonary venous return
Tricuspid atresia
Mitral atresia
Double right ventricle
Ebsteins's malformation
Pulmonary atresia
Hypoplastic left heart syndrome
Transposition of great vessels
Tetrology of fallot
Double outlet right ventricle
Aortic stenosis
Aortic coartation
Fetal arrhythmia (tachycardia, bradycardia, or supraventricular tachycardia)

Genito-urinary

Any genitor-urinary lesion accompanied by oligohydramnios at <24 wks
Bilateral renal agenesis
Cystic renal disease (polycystic or multicystic)
Obstructive uropathy
Horseshoe kidney
Megacystis microcolon
Cloacal abnormality

CNS

Anencephaly
Holoprosencephaly
Dandy-walker malformation or variant
Septo-optic dysplasia
Neural tube defect
Vein of Galen aneurysm

Skeletal

Acondrogenesis
Thanatophoric dysplasia
Osteogenesis imperfecta
Thoracic dysplasia
Hypophosphatemia
Short rib polydactyly
Any skeletal defect with suspected small thorax

Other

Any karyotype abnormality
Any suspected genetic syndrome
Cleft lip/palate
Micrognathia
Hydrops
Fetal anemia
Neck mass
Gastroschisis

Table 2: Minor Fetal Anomalies / Congenital Malformations

(Need two minor anomalies for exclusion)

Cardiac

ASD
VSD
Intracardiac echogenic focus

CNS

Choroid plexus cysts (unilateral or bilateral)
Mild ventriculomegaly (defined by a lateral ventricle measurement of <1.5cm)
Agenesis of the corpus callosum
Arachnoid cyst

Genito-urinary

Pyelectasis
Hydronephrosis
Unilateral renal agenesis (normal AFI)
Pelvic kidney
Hypospadias

Skeletal

Achondroplasia (with normal thoracic circumference)
Clubbed foot (unilateral or bilateral)

Other

Echogenic bowel (Cystic fibrosis negative)
Polydactyly