Preterm Rupture Of The Membranes

Val A. Catanzarite, M.D., Ph.D. and Sean S. Daneshmand, M.D.
San Diego Perinatal Center
8010 Frost Street, Suite 300
San Diego, CA 92123

Preterm rupture of the membranes is one of the most common causes of preterm delivery, accounting for about ¼ of preterm births.

About 10% of babies in the United States are born prior to 36 weeks of pregnancy, and about 3% are born before 32 weeks. Preterm rupture of the membranes, prior to 36 weeks, occurs in about 2½% of all pregnancies or about 1 in 40.

Causes. Sometimes, we will be able to identify a cause for preterm rupture of the membranes. Labor itself can cause rupture of the membranes. Other causes for preterm rupture of the membranes include infection within the uterus, uterine overdistension because of conditions causing an excess amount of amniotic fluid, and cervical weakness ("cervical incompetence"). For most Moms with preterm rupture of the membranes, no cause is apparent.

Diagnosis. Mom usually experiences a gush of amniotic fluid from the vagina, although occasionally there will only be small amounts of leakage. The fluid coming out can be examined under the microscope; amniotic fluid shows a typical "fern" pattern. After membranes rupture, a sterile speculum exam is sometimes done to obtain a fluid sample and to look at the cervix to determine whether it is open or not, and an ultrasound scan is used to check baby's position and the amount of fluid left inside. If at all possible digital examination is avoided, since this can introduce infection.

Management. Treatment for pregnancies complicated by preterm rupture of the membranes depends upon the stage in the pregnancy. After membranes rupture, there are risks for baby staying inside, specifically of development of infection around the baby, compression of the umbilical cord due to the lack of cushioning effect of the amniotic fluid and rapid labor. Also, placental separation occurs in about 2% of pregnancies with preterm rupture of the membranes. These risks need to be balanced against the risks of prematurity.

Newborn outcomes depend upon baby's size and stage in the pregnancy, as well as lung maturity. Babies born at or beyond 36 weeks rarely have any significant problems related to prematurity. Babies born at 35 to 36 weeks typically weigh between 5 and 6½ pounds. They may have short-term problems from lung

immaturity, but typically will be in the hospital for less than a week, and will go home healthy.

Studies have shows that the outcomes for babies born after premature rupture of the membanes are not significantly improved by waiting beyond the 34 week mark (see refererences below)

Babies at 32 to 34 weeks weigh 4 to 5 pounds. As long as they have mature lungs, they do very well in the Nursery, with relatively short hospital stays and good long-term outcomes.

For pregnancies before 32 weeks' gestation, the potential for complications in the newborn period increases. At 32 weeks, even with immature lungs, the rate of survival is nearly 100%, but some babies will be in the Nursery for up to a month. At 28 weeks, when babies typically weigh 2½ pounds or so, the survival rate is still about 90%, but the babies have many complications in the Nursery, are frequently in the hospital for 2 months before going home, and may have long-term health or neurologic problems due to prematurity.

As the gestational age drops below 28 weeks, the risks for both newborn complications and for long-term problems increase.

Balancing risks vs. benefits. If a Mom comes in with ruptured membranes after 34 weeks, our recommendation is for antibiotics to prevent infection, and then delivery. . In the 32 to 34-week range, if the lungs are mature and the baby weighs close to 4 pounds, then the risks to baby from staying inside exceed those of delivery, and antibiotics followed by delivery is.

If membranes rupture before 32 weeks into the pregnancy, then the risks to the baby in utero are generally less than those of delivery, and hospitalization with close monitoring of Mother for evidence of infection or labor and baby for evidence of distress are recommended. Fortunately, most Moms with ruptured membranes before 32 weeks do not go into labor for some time after the membranes rupture. About ¼ will be in labor within a few hours after rupture of membranes. Another ¼ will go into labor within the first week. The remaining half will not go into labor for an extended period of time, sometimes months.

Reducing complications. When Mom is hospitalized with a diagnosis of ruptured membranes, we can reduce the potential for complications by a variety of means:

- Antibiotics. After membranes rupture, there is a risk for bacteria to enter the uterine cavity and cause an infection around the baby. Studies have shown that the combination of ampicillin and a medication of the erythromycin class minimize this risk. At Sharp Mary Birch, we typically give ampicillin (as long as Mom is not allergic) and azithromycin, which has less side effects than erythromycin.

- Corticosteroids. Medications of the corticosteroid class – betamethasone and dexamethasone – have been shown to improve outcomes in babies delivered following ruptured membranes at 32 weeks or before; data is less convincing after 32 weeks. Corticosteriods are given as 2 to 4 doses over a 24 to 48-hour period. These medications are administered shortly after the diagnosis of ruptured membranes, and sometimes a single booster dose is recommended at the time of labor, if there is a long interval between the time of ruptured membranes and the time of labor, and the baby's lungs are not mature.
- Fetal monitoring. Initially after ruptured membranes, we tend to monitor baby and contractions for 4 to 12 hours, and then on a periodic basis. This helps us to assess to see whether Mom is going into labor, and whether baby is staying healthy inside.
- Magnesium sulfate. There is an increasing body of data that the administration of Magnesium Sulfate reduces the risk for cerebral palsy in babies born prematurely. The data is strongest for pregnancies at 24-32 weeks gestation, with suggestive data at 32-34 weeks as well. Therefore, we typically recommend low dose ("neuroprophylactic dose") magnesium sulfate if delivery is anticipated beteween 24 and 34 weeks gerstation.

Can the membranes seal up? Rarely, we will see the membranes re-seal after ruptured membranes (one important exception to this is ruptured membranes after amniocentesis – see below). Unless the membranes re-seal, Mom will stay hospitalized from the time that membranes rupture until the time of delivery.

If labor occurs, or if there is evidence (such as fever) for intrauterine infection, or if the fetal heart rate tracing is nonreassuring, then we deliver the baby, regardless of the stage in pregnancy. Otherwise, we continue to monitor the pregnancy until we reach the 32-week mark, and then check for lung maturity.

What about medications to block labor? In the 1980's, many centers would prescribe drugs to block labor in Moms with ruptured membranes. However, over time we have learned that these medications have the potential for significant side effects on Mother, and do not improve the length of the pregnancy significantly, nor do they improve the outcomes for the babies. Therefore, medications to block labor are not used after membranes rupture, apart from use in blocking contractions for a few hours to permit transfer from one hospital to another.

Is cesarean section needed for delivery? Ordinarily, no. There is a high rate of breech presentation in preterm deliveries – up to ½ of babies will be breech prior to 32 weeks, as opposed to 1 in 50 at full term. So, there is an increased possibility of need for cesarean section based on baby's position. Most babies who are in a head first presentation, will go on to vaginal delivery.

What about subsequent pregnancies? The recurrence risk for preterm birth is quoted as about 30%. If a cause for ruptured membranes, such as excess amniotic

fluid, is present, then the recurrence risk is much lower. If the cause is cervical weakness ("cervical incompetence"), then the recurrence risk can be dramatically reduced by means of placing a suture to hold the cervix shut. For any Mom who delivers prematurely, we recommend detailed consultation prior to a next pregnancy in order to assess for underlying risk factors, and to lay out a plan to minimize the recurrence risk.

Special circumstances

- Rupture of membranes at a very early gestational age (less than 24 weeks) carries additional risks to the pregnancy. After 24 weeks, the lungs have reached their final stage of structural development, and the lung maturation process is a "biochemical" one. However, before 24 weeks, the lungs are structurally immature, and, if membranes rupture, the lungs may not develop completely. This condition is called lung hypoplasia. The earlier membranes rupture, the more likely the baby is to have pulmonary hypoplasia.
- When membranes rupture prior to 23-24 weeks, the recommendation may be for antibiotics to limit risk of infection, and then home bedrest and surveillance until the pregnancy reaches 23 to 24 weeks, then hospitalization.
- Rupture of membranes after amniocentesis has a much better prognosis. Over 90% of women who have rupture of membranes after an amniocentesis procedure, will have the membranes re-seal, and will go on to delivery at or near term.

Will specialists be involved in my care or the care of my baby? Oftentimes, a perinatologist (also called a maternal-fetal medicine specialist) will be involved with your care if you rupture membranes prior to 34 weeks into the pregnancy, to assist in evaluation and treatment. After delivery, depending upon baby's gestational age, size, and condition, a neonatologist – a pediatrician with subspecialty training in care of the newborn – will be helping with the baby's care.

In summary, our usual recommendations for care of Moms with preterm rupture of the membranes are as follows:

- Establish the diagnosis.
- Perform an ultrasound examination to check baby's position, fluid volume, and size.
- PROM before 23-24 weeks: Individialize management.
- PROM between 24 and 32 weeks: Hospitalization, antibiotics, corticosteroids, and delivery at 32 weeks if the weight estimate is about 1800 grams and the lungs are mature.
- Neuroprophylactic dose magnesium sulfate if delivery is anticipated at 24-34 weeks
- PROM between 32 and 34 weeks: Same as above, but corticosteroids may or may not be recommended after 32 weeks.
- PROM at or beyond 34 weeks: Antibiotics, and, at our institution, delivery.

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This handout is developed for your information. Each pregnancy is different, and management recommendations may vary depending upon the specifics of your circumstances. If you have questions, please ask the very knowledgeable nursing staff in the Perinatal Special Care Unit, or your Obstetrician or consulting Perinatologist or Neonatologist. Your feedback is much appreciated. Please write to Dr. Catanzarite or Dr. Daneshmand at the address on the first page.

