**Pre-Labour Rupture of the Membranes**(RROM)

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**2017-2018**

**Objective: aim from this lecture:**

**1.understand the causes and prevention of PROM**

**2.be able to manage a case of PROM**

Defined as rupture of membranes with leakage of amniotic fluid in the absence of uterine activity or before the onset of labour. When the gestational age is less than 37 wks we call it preterm (RROM) (preterm, pre labour rupture of membrane).

**INCIDENCE.**

PPROM occur occurs in approximately 2% of all pregnancies and accounts for up to

one-third of preterm deliveries.

## Etiology.

Term PROM reflects physiological process, while preterm PROM has pathological origin. Ascending infection is the major cause and majority of infections when it is recurrent are subclinical, another factor is ante partum hemorrhage. Nutritional factors , and smoking may be important in a significant proportion of cases ofPPROM, week cervix can also predispose to PROM**.** Women with prior preterm premature rupture of membranes (PPROM) are at increased risk for recurrence during a subsequent pregnancy

**CLINICAL DIAGNOSIS&ASSESSMENT .**

Essentials of Diagnosis:

1. **History**. Symptoms are the key to diagnosis; the patient usually reports a sudden gush of fluid (watery vaginal discharge)or continued leakage. Additional symptoms that may be useful include the color and consistency of the fluid and the presence of flecks of vernix or meconium.

**2.Examination:**general for vital signs

Abdominal for fundal height, tenderness, contractions and fetal monitoringSterile Speculum examination is necessary to confirm the diagnosis for direct visualization of leakage; ferning; and nitrazine tests.

Other suggestive point in the examination: reduced size of the uterus, and increased prominence of the fetus to palpation.

**Differential diagnosis**

1. Urine loss: incontinence and UTIs are both more common in pregnancy
2. Vaginal infection
3. Leukorrhoea: the cervical glands often become overactive during pregnancy

**The examiner should look for the 3 hallmark confirmatory findings associated with PROM:**

PROM should be confirmed by sterile speculum examination performed after the mother has rested supine for 20-30 minutes. Amniotic fluid should be seen pooling in the posterior fornix.

**Sterile speculum examination is done to verify PROM, estimate cervical dilation, collect amniotic fluid for fetal maturity tests, and obtain samples for cervical cultures**

**1. Pooling**—the collection of amniotic fluid in the posterior fornix either spontaneously or after gentle fundal pressure

.

**2. Nitrazine test**—a sterile cotton-tipped swab should be used to collect fluid from the posterior fornix and apply it to Nitrazine (phenaphthazine) paper. In the presence of amniotic fluid, the Nitrazine paper turns blue, demonstrating an alkaline pH (7.0–7.25). If the color remains yellow probably the membrane is intact

**3. Ferning**—Fluid from the posterior fornix is placed on a slide and allowed to air-dry. Amniotic fluid will form a fernlike pattern of crystallization.

A digital exam (PV) should be avoided unless the patient is thought to be in established labor as it is known to be increased incidence of:

-Chorioamnionitis.

-Postpartum endometritis.

-Neonatal infection.

## Other Basic tests to confirm the diagnosis of PROM.

**4. Ultrasound (U/S):-** should evaluate the amniotic fluid. The amniotic fluid volume (usually measured by deepest vertical pocket [DVP] or amniotic fluid index [AFI] . May be useful additional investigation in those women with strong history of PROM .in addition U/S is useful to assess the fetal presentation ,biometry for gestational age, anatomy, placenta and cord location,

***5*.** **Cervical cultures includingChlamydia trachomatis *and* Neisseria gonorrhoeae****isindicated especially in high risk group*.***

**6.Group B streptococcus (GBS) culture should be sent from ano-rectal and vaginal areas**.

**7.Specialized tests**

Vaginal swabs for:

* **A. (Fetal fibronectin):-**It is a glycoprotein present in large amount in the amniotic fluid. It can be detected in the endocervix or the vagina of patient with PROM by (ELIZA).
* **B. (Insulin-like growth factor binding protein 1)(IGFBP1**)
* C.( β **HCG)**.

all the above three present in high concentration in the amniotic fluid and have available rapid bedside tests

**8. Amniocentesis can be of use for the evaluation of:**

a) The **diagnosis. If diagnosis is in doubt,** 1 ml of indigo carmine in 9 ml of normal saline can be injected into the amniotic cavity under continuous ultrasound guidance Presence of blue on a pad worn on the perineum for 2–4 hours confirms the diagnosis.

b)The infectious state of the amniotic cavity. Send amniotic fluid glucose (< 15 mg/dl associated with positive culture),Gram stain, and culture.

c) The fetal lung maturity. Results of similar accuracy to amniocentesis can be obtained non-invasively by collecting vaginal fluid using a bedpan

**Complications of PROM.**

**1.Infection** :-chorioamnionitis occur frequently in pt. with PROM,

The Dx of it required the presence of fever ≥38 C0 &at least 2 of the following {maternal tachycardia>100bpm , fetal tachycardia>160bpm , uterine tenderness, raised C-reactive protein, offensive vaginal discharge).

Based on the culture results after amniocentesis in PROM anaerobes are the commonest isolate followed by group B streptococcus , Escherichia coli are common causes of infection. Other organisms in the vagina may also cause infection.

**2.(PPROM) include: premature labor/delivery with related complications of prematurity such as**

 (a) respiratory distress syndrome or (RDS)

 (b) intraventricular hemorrhage(IVH) and

 (c)periventricular leukomalacia (PVL).

 (d)infection and necrotizing enterocolitis (NEC).

**3.Abruptio placenta:-** usually occur within the setting of prolonged & severe oligohydramnios .Clinically present as mild –moderate vaginal bleeding & preterm labour

**4.Fetal distress:-** variable deceleration may occur due to cord compression

**And complications especially for PPROM < 24 weeks include:**

**5. perinatal death,**

**6. pulmonary hypoplasia** is frequent when PROM occurs before 26wk. & the latent period prolonged for > 5weeks.,

**7. compression deformities facial & skeletal deformities** may occur with prolonged PROM.

**8. long-term infant morbidities.**

**9.increased need for cesarean delivery.**

**10. retained placenta.**

**Management of patient with PROM:-**

Management of PPROM continues to be controversial. However, many obstetricians will institute conservative management in PPROM before 34 weeks and would induce labour relatively early in women whose membrane rupture occurs subsequent to 37 weeks. There is currently no good evidence as to what ideal management should be between 34 and 37 weeks.

**\*Determination of gestational age :-**

 **TERM PROM.**

The interval between PROM and onset of spontaneous labor (latent period) and delivery varies inversely with gestational age. At term, > 90% of women with PROM begin labor within 24 h; at 32 to 34 wk, mean latency period is about 4 days

 The term pregnancy (EGA= or greater than 37 weeks) with PROM in the absence of infection can be managed expectantly or actively. Expectant management entails non intervention while waiting for the patient to go into labor spontaneously, whereas active management entails induction of labor with an agent such as oxytocin (Pitocin). Nonintervention is an acceptable initial course of treatment, but if the patient does not go into labor within 6–12 hours after PROM, labor should be induced to minimize the risk of infection. In the presence of an unfavorable cervical condition with no evidence of infection, it is reasonable to wait 24 hours prior to induction of labor to decrease the risk of failed induction and maternal febrile morbidity

**Preterm PROM**

 **Identification of patient who requires delivery first group)**

**1.** Patient in labour (frequent uterine contractions, cervix 100% effaced & 4cm dilated or more).

**2.**Mature fetal lung checked by amniocentesis ((by L/S ratio, phosphatidyle glycerol (PG)).

**3.** Fetal malformation (gross anomaly incompatible with life).

**4.** Fetal distress.

**5.** Patient With overt infection (Patient with clinical chorioamnionitis should received antibiotic before delivery inform of (ampecillin 2 g i.v. q.d.s (4 times daily) & metronidazol 500 mg.i.v. t.d.s (3 times daily). **Once antibiotics have been started, labor should be induced If the condition of the cervix is unfavorable, and there is evidence of fetal involvement, it may be necessary to perform a cesarean section**

**6.** Patient With subclinical amnionitis. (Amniocentesis of gram stain & culture is accepted technique) .

**7.** Patient At high risk for infection :-

1. maternal HIV,
2. primary maternal herpes simplex virus infection
3. Pt. Taking immunosuppressant drugs.
4. History of rheumatic heart disease.
5. I DDM.
6. Sickle cell disease.
7. Heart valve prosthesis.
8. Who had several pelvic examinations since PROM occur.

Those who are not having indication for delivery are offered the expectant management**(second group).**

**Expectant management**:-

* (in very few cases of PPROM, the membranes may seal over and the fluid may stop leaking without treatment, although this is uncommon unless PROM was from a procedure, such as amniocentesis, early in gestation)
* The primary maternal risk with expectant management of PPROM is infection. This includes chorioamnionitis (13-60%), endometritis (2-13%), sepsis (< 1%), and maternal death (1-2 cases per 1000). Complications related to the placenta include abruption (4-12%) and retained placenta or postpartum hemorrhage requiring uterine curettage .

In many units, women with a diagnosis of PPROM are admitted into hospital and managed conservatively until 37 completed weeks of gestation in an attempt to increase fetal lung maturity.

**Conservative management involves:**

1. Admission to hospital & the woman's activity is limited to modified bed rest & complete pelvic rest with bath room privileges

2.Maternal surveillance . All women with PPROM should be monitored for signs and symptoms of infection by :

\*four-hourly measurements of maternal temperature, heart rate, respiratory rate, and blood pressure.

 \*weekly maternal white cell counts, C-reactive protein assays, and Lower genital tract swabs culture are routinely taken, all in an effort to detect intrauterine infection or chorioamnionitis.

**3.**The fetal surveillance: The two most common types of fetal surveillance are NST and biophysical profile (BPP). Abnormalities of these tests can be somewhat predictive of fetal infection and umbilical cord compression related to oligohydramnios. Initially, continuous electronic fetal heart rate (FHR) and contraction monitoring should be conducted for 48 hours. If testing reveals reassuring fetal status with

adequate AFI, then the patient can be observed on the antepartum ward with

* **daily nonstress testing**
* U/S for liquor volume **twice weekly AFI evaluation.**

 **Twice-weekly biophysical profiles for those patients with an AFI greater than 5 are also acceptable**

4.serial U/S growth every fortnight are arranged.

**5.Antibiotics:** 250 mg of erythromycin every six hours for 10 days.

**Co-amoxiclav is not recommended for women with PPROM because of concerns about necrotizing enterocolitis.**

**6.**Corticosteroids should be administered in women with PPROM at 24–34 weeks, as this intervention is associated with lower incidences of RDS, IVH, NEC, and a trend for a lower neonatal death rate. They do not appear

to increase the risk of infection in either mother or baby

**7.**Tocolysis may be used for Women with PPROM and uterine activity who require intrauterine transfer or antenatal corticosteroids .tocolysis is given ≤ 48 hours to allow administration of corticosteroids. The arguments against their use are that they may mask evidence of maternal infection (e.g., tachycardia) and that contractions associated with the membrane rupture may be indicative of uterine infection.

**8.Amnioinfusion for prolonging latency:**

Trans abdominal amnioinfusion is not recommended as a method of preventing pulmonary hypoplasia in very preterm PPROM.

**9. Use of fibrin glue**. Fibrin sealants are not recommended as routine treatment for second-trimester oligohydramnios caused by PPROM**.**

**10.****Vitamin C and E*.***

There is insufficient evidence to assess the effect of vitamin

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| supplementation in women with PPROM. In one small trial, compared with placebo, vitamin C 500 mg and vitamin E 400 IU daily in women with PPROM at 26–34 weeks was associated with 7-day prolongation in latency, but no other effects on maternal or neonatal morbidity and mortality.11.Role of Outpatient ManagementIn rare selected cases, patients who remain undelivered may be candidates for outpatient monitoring should be considered only after a period of 48–72 hours of inpatient observation .If leakage of fluid stops, the amniotic fluid volume normalizes, and the patient remains a febrile without evidence of increasing uterine irritability, she can be discharged home. These patients should be monitored very closely on an outpatient basis. They must be reliable and compliant with follow-up appointments. The fetus should be presenting as a vertex, and the cervix should be closed to minimize the chance of cord prolapse. At home, restricted physical activity is advised, no coital activity should occur They also must take their temperature twice daily and be counseled on the warning signs of chorioamnionitis. These patients should also be monitored with frequent biophysical profiles; some sources recommend daily testing.

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| Instructions should be given to return immediately if the temperature exceeds 100°F (37.8°C).  |

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| The patient should be seen weekly, at which time her temperature is taken, nonstress testing is done after 28 weeks, and the baseline fetal heart rate and AFI are evaluated. Ultrasonic evaluation of fetal growth should also be carried out every 2 weeks. **Any patient with oligohydramnios is not a candidate for outpatient management.**  |

12.**When is the appropriate time to deliver?** Delivery should be considered at 34 weeks of gestation. Pregnancies beyond 34 weeks' EGA can be managed as a term pregnancy because there is no evidence that antibiotics, corticosteroids, or tocolytics improve outcome in these patients. These patients can be managed expectantly as long as they show no signs of chorioamnionitis. Randomized trial have suggested that a policy of induction as opposed to expectant management may lead to less hospitalization, less perinatal infection and less neonatal morbidity .Where expectant management is considered beyond 34 weeks of gestation, women should be counseled about the increased risk of chorioamnionitis and its consequences.

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| Labor and Delivery  |

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| The same considerations discussed under preterm labor apply to patients with PROM. The decrease in amniotic fluid that is sometimes seen can result in early cord compression and the presence of variable fetal heart decelerations. This is true of both vertex and breech presentations; therefore, there is a necessity for abdominal delivery in a large number of cases unless fluid replacement can be instituted by amnioinfusion |

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**Previable PROM bellow 23-24 weeks** there are significant risks of lethal pulmonary hypoplasia a condition that can't be reliably predicted on prenatal U/S additional risk include chronic pulmonary morbidity, fetal limb contractures , many parent will opt for termination of pregnancy.

Recommended Management of Preterm Ruptured Membranes

Gestational Age Management

**(1).34 weeks or more** Proceed to delivery, usually by induction of labor

Group B streptococcal prophylaxis is recommended

**(2).32 weeks to 33** completed weeks Expectant management unless fetal pulmonary maturity is documented

Group B streptococcal prophylaxis is recommended

Corticosteroids—no consensus, but some experts recommend

Antimicrobials to prolong latency if no contraindications

**(3).24 weeks to 31** completed weeks Expectant management

Group B streptococcal prophylaxis is recommended

Single-course corticosteroid use is recommended

Tocolytics—no consensus

Antimicrobials to prolong latency if no contraindications

**(4).Before 24 weeksa** Patient counseling

Expectant management or induction of labor

Group B streptococcal prophylaxis is not recommended

Corticosteroids are not recommended

Antimicrobials—there are incomplete data on use in prolonging latency