

# Timing Strategies for Delivery of Individuals with Placenta Praevia and Accreta

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**ABSTRACT:** ***Background:** Placenta accreta is increasing in frequency; likely because of the increased frequency of cesarean delivery. **Objectives:** To compare strategies for the timing of delivery in individuals with placenta praevia and ultrasonographic evidence of placenta accreta, and to determine the optimal gestational age at which to deliver individuals. **Materials and Methods:** A decision analytical model was designed using DATA 3.5 software that compared SIX different strategies for the timing of delivery of individuals with ultrasonographic evidence of placenta praevia with accrete on the basis of Published Data. **Results:** The strategy that provides the highest total quality-adjusted life years for the maternal-fetal dyad is delivery at 34 weeks of gestation after administration of antenatal corticosteroids. **Conclusion:** A scheduled delivery at 34 weeks of gestation was the preferred strategy and resulted in the highest quality-adjusted life years under the base case assumptions. After sensitivity analyses, delivery at 37 weeks of gestation without amniocentesis was the preferred strategy in limited situations, and delivery at 39 weeks of gestation was the preferred strategy only in unlikely situations.*

**Keywords:** PRAEVIA, ACCRETA

## 1. Aim of Study

To compare strategies for the timing of delivery in individuals with placenta praevia and ultrasonographic evidence of placenta accreta, and to determine the optimal gestational age at which to deliver individuals.

## 2. Introduction

Morbidly adherent placenta occurs when there is a defect of the decidua basalis, resulting in abnormal attachment of placenta to myometrium. It is due to imperfect development of nitabuch layer (a fibrinoid layer separating decidua basalis from placental villi). MOBIDLY ADHERENT PLACENTA CAN BE OF DIFF. TYPES/GRADES

- **Placenta Accreta:** There is direct contact of chorionic villi with myometrium without intervening decidua basalis
- **Placenta Increta:** Chorionic villi invade myometrium but donot reach serosal layer.
- **Placenta Percreta:** Chorionic villi invade myometrium to reach or extend beyond serosa into surrounding tissues or organs.

Because of the life-threatening hemorrhage that often occurs with this condition in the context of delivery, the typical management includes peripartum hysterectomy. Placenta accreta is increasing in frequency; likely because of the increased frequency of cesarean delivery.<sup>1</sup> Recent data have revealed an incidence of placenta accreta of 1 in 533 pregnancies. Antepartum recognition of placenta praevia and accreta may be accomplished with ultrasonography<sup>2</sup> this recognition may assist in limiting maternal morbidity without increasing neonatal morbidity. The difficulty of performing a hysterectomy at the time of delivery, particularly in the presence of invasive placentation, may be significant and potentially lessened by advanced planning and interdisciplinary collaboration. In mothers with a praevia and a suspected accreta who may require peripartum hysterectomy, a scheduled delivery has been associated with

shorter operative times and lower frequency of transfusions, complications, and intensive care unit (ICU) admissions. As gestational age increases, individuals with placenta praevia have an increased risk of emergent bleeding. Studies have documented that approximately 90% of individuals with placenta praevia had symptomatic bleeding before 37 weeks and that a majority of individuals with placenta praevia required preterm delivery. Thus, the benefits of a SCHEDULED DELIVERY would require that delivery be planned at a preterm gestation. However, too early a delivery may expose a neonate to prematurity complications. Optimal care would strike a balance between the complications of prematurity and those related to emergent delivery.

*This decision analysis seeks to determine the optimal gestational age at which to deliver individuals with ultrasonographic evidence of both placenta praevia and accreta in individuals who reach 34 weeks of gestation*

## 3. Materials and Methods

This study was conducted by LALLA DED Hospital, an associated hospital of government medical college Srinagar. A decision analytical model was designed using DATA 3.5 software that compared SIX different strategies for the timing of delivery of individuals with ultrasonographic evidence of placenta praevia with accreta on the basis of PUBLISHED DATAS<sup>1-10</sup>

*It was LEVEL III evidence (opinions of respected authorities based on clinical experience, descriptive studies or case reports, reports of expert committees).*

- The values placed into the model were ascertained through a thorough search of the literature and included utilities that were contained in a recently published datasets
- SIX strategies were formulated
- 1,2: DELIVER AT 34, 35 wk after steroids
- 3 4 5 6 : EXPECTANT treatment was given

- **IN ALL: if hemorrhage occurred, expectant management was withheld and emergency CS was done**

Base case estimates were chosen from data in published literature. ICU estimates were taken from data documenting risk of peripartum hysterectomy. Estimates of the weekly risk of hemorrhage necessitating delivery were derived from data documenting gestational age of delivery in three studies with more than 400 expectantly managed individuals with placenta previa<sup>3,4,5</sup>. Respiratory distress syndrome (RDS) estimates were derived from a multicenter observational study detailing neonatal morbidity among more than 20,000 neonates who were not routinely administered steroids.<sup>6</sup> The model assessed the effectiveness of each strategy with the perspective of the analysis as that of the pregnant woman and her child. *The base case results were derived for a 30-year-old multiparous woman with a previous cesarean delivery who had reached 34 weeks of gestation with ultrasonographic evidence of placenta praevia and accreta.* The base case individual was managed as an outpatient. The individual life expectancies for both the mother and newborn were assumed to be 75 years. Quality-adjusted life years for each terminal branch were based on this anticipated life expectancy. When a range of values for a given variable was found in the literature, the ranges were evaluated using sensitivity analysis. Both maternal and fetal outcomes were incorporated into the model. Adverse maternal outcomes included ICU admission because of major maternal morbidity. Cesarean deliveries were performed for all individuals, and those individuals without spontaneous placental separation underwent peripartum hysterectomy.

- Women with spontaneous placental separation were correspondingly considered to have been those with placenta praevia whose ultrasound examinations had been falsely positive for accreta; these women were at markedly lower risk for ICU admission and morbidity than were those with actual accreta.
- Adverse perinatal outcomes considered in the model were perinatal mortality, RDS, cerebral palsy, mental retardation, and infant mortality.

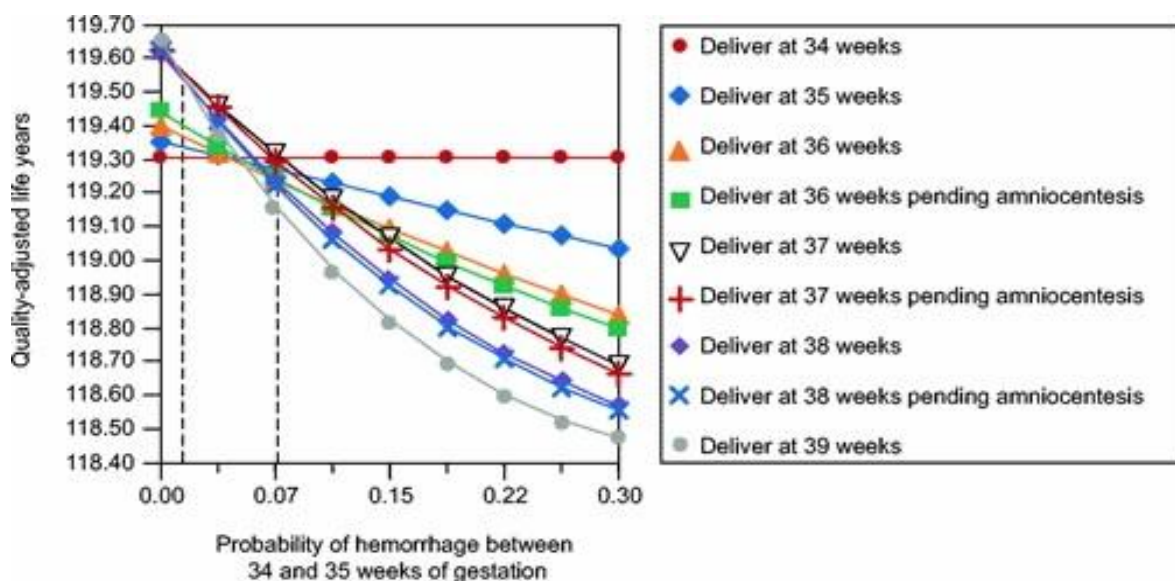
- The maternal utility of ICU admission was based on a study that demonstrated individuals' estimations of their quality of life 3 years after their ICU stay<sup>7</sup>
- Base case estimates for newborn utilities were based on a study detailing parental preferences for different morbidities affecting their children. Applied utilities for both mental retardation and cerebral palsy were those for moderate cerebral palsy and moderate mental retardation.<sup>8</sup> The utilities associated with RDS were applied for shorter durations than the utilities for chronic conditions such as cerebral palsy and mental retardation. For the purpose of this analysis, cerebral palsy and mental retardation utilities were applied from 1 year of life onward. The estimate for the infant mortality rate was derived from literature regarding infants without congenital anomalies. Baseline risks of stillbirth were not assumed to differ outside of the setting of a serious hemorrhagic event necessitating delivery

#### 4. Results

- The strategy that provides the highest total quality-adjusted life years for the maternal-fetal dyad is *delivery at 34 weeks of gestation after administration of antenatal corticosteroids (strategy 1)*<sup>9</sup>
- Another notable characteristic about the ranking of strategies is that delivering individuals without amniocentesis is always favored over delivery only after confirmation of fetal lung maturity at a given gestational age.

These sensitivity analyses revealed that changes in three variables

- 1) The probability of antepartum hemorrhage with expectant management
- 2) The probability of perinatal mortality associated with antepartum hemorrhage requiring delivery
- 3) The probability of ICU admission after scheduled cesarean delivery—affected the order of the strategy rankings.



If the risk of antepartum hemorrhage necessitating delivery is between 1% and 7% at 34 weeks of gestation, then the

preferred strategy is to deliver at 37 weeks of gestation without performing amniocentesis. Only when the risk of serious hemorrhage necessitating delivery is less than 1%, a probability outside the range of published values, does expectant management until 39 weeks of gestation become the most preferred strategy. If the risk of antepartum hemorrhage necessitating delivery is between 1% and 7% at 34 weeks of gestation, then the preferred strategy is to deliver at 37 weeks of gestation without performing amniocentesis.<sup>10</sup> Only when the risk of serious hemorrhage necessitating delivery is less than 1%, a probability outside the range of published values, does expectant management until 39 weeks of gestation become the most preferred strategy. The results were also determined after incorporation of a more liberal betamethasone administration policy. Under this policy, mothers delivering in a nonemergent fashion between 34 and 38 weeks of gestation received betamethasone 2 days to 1 week before delivery. The only mothers who did not receive betamethasone were those for whom amniocentesis demonstrated lung maturity, those delivering emergently, or those delivered at 39 weeks of gestation. When administered beyond 34 weeks, steroids were still presumed to decrease the risks of RDS by 50%. Even under this alternate policy, no material differences were noted in the quality-adjusted life years or ranking of the delivery. Probability of perinatal mortality during an acute hemorrhagic episode revealed that when the probability of perinatal mortality is 0.6% or higher, the preferred strategy is always delivery at 34 weeks of gestation after administration of steroids, irrespective of the maternal risk of ICU admission after an emergent delivery. When the risk of perinatal mortality reaches 0.1% or less, the preferred strategy switches to delivery at 37 weeks of gestation, except when the risk of maternal ICU admission after emergent cesarean delivery is between 1.5% and 8.4%. The probability of perinatal mortality during acute hemorrhage is 0.5% or higher, the preferred strategy remains delivery at 34 weeks of gestation after administration of steroids, regardless of the maternal utility assigned to ICU admission. At lower probabilities of perinatal mortality, the preferred strategy becomes dependent on the maternal utility for ICU admission.

## 5. Conclusion

A scheduled delivery at 34 weeks of gestation was the preferred strategy and resulted in the highest quality-adjusted life years under the base case assumptions. After sensitivity analyses, delivery at 37 weeks of gestation without amniocentesis was the preferred strategy in limited situations, and delivery at 39 weeks of gestation was the preferred strategy only in unlikely situations.

## 6. Discussion

This decision analysis indicates that in women with placenta accreta, the preferred strategy for timing of delivery under a variety of (but not all) circumstances are a scheduled delivery at 34 weeks of gestation. The elucidation of an optimal strategy for these individuals is of particular relevance today.

- *The increasing incidence of cesarean delivery likely portends a future increase in this population of*

*individuals, meaning that this clinical scenario may become more frequent in the coming years.* The particular salient finding with respect to the timing of delivery in women with suspected accrete was as follows:

Under most reasonable clinical circumstances, there is no benefit to be gained by expectantly managing these individuals beyond 37 weeks of gestation and, in many cases; delivery at 34 weeks of gestation is preferred.

- ***THE PREFERRED GESTATIONAL AGE IS ALMOST CERTAINLY AT OR BEYOND 34 WEEKS BUT NOT LATER THAN 37 WEEKS.***
- As demonstrated by the decision tree model, the preferred strategy for timing of delivery in individuals with placenta accreta is delivery at 34 weeks of gestation. This result takes into account both long-term and short-term outcomes of the mother and child.
- This result does not imply that all women with this condition should be delivered at this gestational age. As is also clear from the model, there are some circumstances (i.e., when the probability of antepartum hemorrhage or the adverse consequences from such bleeding are lower) that would lead one to advocate for awaiting planned delivery until approximately 37 weeks of gestation. Thus, clinical judgment to the best of one's ability will be crucial in discussions and decision-making with the individual. *The results of the present decision analysis should support the concept that planned delivery at 34 weeks of gestation may be warranted under many circumstances and that there is little reason to believe that awaiting labor beyond 37 weeks of gestation is a beneficial strategy.* Furthermore, this analysis should support the concept that for any given gestational age at which delivery is planned for women with suspected accreta, there seems little reason to use amniocentesis for confirmation of fetal lung maturity.

## 7. Limitations

- First, this is not a clinical trial. Because of the relatively infrequent occurrence of placenta accreta, it is unlikely that a prospective, randomized clinical trial will ever be performed to address the decision of delivery timing in this population of individuals.
- Another limitation, inherent to all decision analyses, is the choice and precision of the estimates included in the model. Although some probabilities were derived from large studies containing thousands of participants, other probability estimates relied on studies containing substantially smaller population sizes.

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