

Case Report

Fetal Exsanguination from Lower Segment Cesarean Section: Techniques Revisited

Michael G. Ross*

Department of Obstetrics and Gynecology, David Geffen School of Medicine at UCLA, USA

*Corresponding author

Michael G. Ross, 1000 W., Carson Street, RB3, Torrance, CA, USA, Tel: 310-781-3628; Fax: 310-972-2962; Email: mikeross@ucla.edu

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Abstract

Background: With an anterior placenta at Cesarean section, obstetricians often will transect the placenta to deliver the infant. Occasionally (e.g., malpresentation, low station), infants are not rapidly delivered and severe neonatal anemia/hypovolemia may result. Options for the prevention of fetal bleeding may be life saving.

Case: At the time of Cesarean section, an anterior placenta was transected to enter the uterine cavity. With difficult elevating the fetal head, the infant was delivered 6 minutes following uterine incision. The infant demonstrated severe anemia and acidosis, and died following attempted resuscitation.

Conclusion: Ultrasound placental location may facilitate blunt dissection around the placenta rather than transection, as fetal blood loss may be life threatening. Although counterintuitive, *in utero* umbilical cord clamping may prevent exsanguination with minimal hypoxic consequences.

Teaching points:

1. With knowledge of placental location, clinicians should consider blunt dissection around an anterior placenta rather than sharp or blunt placental transection.

2. In cases in which the placenta is transected, and when there is difficulty delivering the infant, rapid clamping of the umbilical cord *in utero* will minimize potential fetal hemorrhage with minimal hypoxic consequences.

Precise: If Trans section of the placenta is required at Cesarean section, *in utero* umbilical cord clamping prior to delivery may prevent exsanguination with minimal hypoxic consequences.

INTRODUCTION

Neonatal anemia may occur chronically as a result of autoimmune or infectious processes or acutely as a consequence of fetal to maternal hemorrhage, vaso previa and rarely abruptio placenta. With the continued increase in the cesarean section rate, obstetricians are frequently faced with lower segment uterine incisions in the presence of an anterior placenta. The following case describes the risk of fetal bleeding associated with transection of the placenta during a cesarean section. Articles addressing techniques for prevention were published in the 1950's, though the topic and procedures are not commonly discussed nor taught.

CASE

A 40 year old gravida 2 para 1 was admitted at 38 4/7 weeks for labor. Ultrasound on admission revealed an anterior placenta, normal amniotic fluid volume, and an estimated fetal

weight of 3703 g. The patient progressed in labor to complete /+1 station and initiated pushing. Despite four hours of pushing, she remained at +1 station. Although a decision was made to proceed with cesarean section, the surgery was delayed due to another emergent surgery, resulting in a six hour second stage. The fetal heart tracing remained category 1. At the time of uterine incision, the anterior placenta was noted at the incision and was transected bluntly to enter the uterine cavity. Modest bleeding was observed. There was marked difficulty delivering the fetal head (OP position) despite manual vaginal elevation and extension of abdominal skin, muscle and uterine incisions. The head was delivered 6 minutes following uterine incision. The patient developed a left broad ligament hematoma which was conservatively managed and she recovered without incident.

The infant demonstrated pallor, with no spontaneous cry and absent tone. Resuscitation was immediately initiated with endotracheal (ET) intubation and ET epinephrine. An umbilical

vein catheter was placed and a blood sample revealed a pH of 6.55 and hematocrit of 10%. The resuscitation was terminated at 20 minutes of age and the infant declared.

DISCUSSION

This unfortunate case resulted from the concordance of two events: an anterior placenta (which required transection) and difficulty in delivering the fetus. The modest bleeding observed was at least in part fetal blood, resulting from transection of fetal-placental vessels.

When presented with an anterior placenta at the time of cesarean section, clinicians often transect the placenta to deliver the infant. At the end of the 19th century, Leopold [1] and Kelly [2] described how placental incision may lacerate fetal blood vessels resulting in a rapid hemorrhage. Neligan and Russell [3] suggested blunt dissection of an anterior placenta from the uterus until the chorioamniotic membranes are reached and entered, after which the authors suggest clamping the umbilical cord (prior to delivery of the infant). Placental blunt dissection will result in maternal, though not likely fetal bleeding. Although umbilical cord clamping would result in fetal hypoxemia, infants can likely tolerate equivalent minutes of severe hypoxia far better than major hemorrhage from the fetal-placental vessels. Complete fetal cord occlusion increases base deficit by approximately 0.5 mmol/L per minute [4] and fetuses can typically tolerate up to 16-18 minutes of asphyxia without significant morbidity (dependent upon the preexisting acid-base status) [5].

In contrast, fetal hemorrhage can occur rapidly. Cardiac output of the term fetus approximates 1500 ml/min [6]. With 40% of the cardiac output directed to the umbilical arteries, the placenta receives approximately 600 ml/min of fetal blood. Laceration

of major fetal-placental vessels may rapidly deplete fetal blood volume. As the fetal-placental blood volume approximates 100 ml/kg fetal weight, a blood loss of only 100 ml may represent a third of the total fetal blood volume. If this occurs acutely, severe morbidity often results.

Based upon the current review, we recommend that placental location be assessed by ultrasound prior to cesarean section and whenever possible, uterine incisions planned to avoid an anterior placenta. Should the placenta be encountered at the uterine incision, clinicians should be aware of options to either bluntly dissect around the placenta or to transect the placenta or promptly clamp the umbilical cord *in utero*, particularly if there is difficulty in rapid delivery of the infant. Although cord clamping may appear counterintuitive, clinicians must recognize that the blood they visualize may well be fetal. In addition, we suggest that pediatric staff should be alerted to the risk of neonatal hemorrhage in cases of placental transection.

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