

Umbilical Cord Prolapse: An Obstetric Emergency with Dire Consequences and Ways to Improve Maternal and Fetal Outcomes.

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Introduction

Umbilical Cord Prolapse is a rare emergency in obstetrics. It occurs in less than one percent of all live births. The umbilical cord presents outside of the uterus and this is often accompanied by fetal bradycardia and/or variable decelerations. When cord compression occurs for a long period of time, it can cause asphyxiation, the leading cause of the fetal mortality in this condition. Several maneuvers can be implemented in order to improve outcomes. The following case presentation depicts the prolapse of the umbilical cord in a patient who presented to the Obstetrics Emergency Department complaining of vaginal bleeding and contractions. The fetal head was manually elevated to prevent compression of the umbilical cord and the patient gave birth to a live baby boy with APGAR scores of nine and nine. This case is particularly interesting because the fetal heart tones were reassuring throughout the initial evaluation of the patient. Pre-conception counseling, adequate prenatal care and patient education on when to go to the hospital for evaluation can reduce the risk of pregnancy complications. For family physicians that also perform obstetrics, it is important to recognize this condition and how to manage it effectively.

Case Description

A 28 year old Gravida 3 and Para 1011 at 38 weeks and 2 days gestation presented to the Obstetrics Emergency Department complaining of uterine contractions and vaginal bleeding. The pregnancy was complicated by a threatened abortion at eight weeks of gestation, anemia of pregnancy, placenta previa and a positive Group B Streptococcus culture. All other pre-natal labs were within normal limits. Her first pregnancy was unremarkable with the term birth of a live, healthy six pound, seven ounce baby boy through a normal spontaneous vaginal delivery. Her second pregnancy ended by spontaneous, complete abortion at 12 weeks which did not require dilatation and curettage. Her gynecological history was significant for onset of menses at the age of twelve, regular cycles every twenty-eight to thirty days and six day periods. Her last sexual activity was in September of 2015 after she was diagnosed with placenta previa. She denies a history of sexually transmitted diseases and abnormal cervical cancer screening. Her past medical history includes hypertension and history of a motor vehicle accident in 2007. Her surgical history includes a nasal bone fracture repair after the above mentioned motor vehicle accident. Family history is negative for any medical conditions in her immediate family. Social history is negative for alcohol, tobacco or drug use. Her only medication was a pre-natal vitamin.

Two days prior to this admission, she was evaluated in the Obstetrics Emergency Department for decreased fetal movement. Ultrasound done at that time showed a placenta that was two to three centimeters from the internal cervical os. Her stress test was reactive and she was discharged home with routine instructions. When she presented to the Obstetrics Emergency Department two days later, she complained of worsening contractions over the course of the

day, which she later admitted had been present intermittently for several days prior. She also complained of bright red blood per vagina that started one hour before she presented to the emergency room. She denied decreased fetal movement, fluid loss, fevers, chills, chest pain, shortness of breath, weakness, dizziness, nausea, vomiting or changes in her skin.

On physical exam, the patient was in mild distress due to pain. Heart had a regular rate and rhythm. Lungs were clear to auscultation bilaterally. Abdomen was soft, gravid, and no rebound or guarding present. She had no tenderness to palpation. Extremities had no edema. Skin was warm, dry and slightly pale with no rashes. Tocometer showed irregular contractions and fetal heart tones were category one with an average heart rate of one hundred and forty. Digital exam was not performed due to patient's history of placenta previa. Speculum exam revealed a large blood clot covering the exterior of the cervical os. During removal of the speculum, the large clot was displaced revealing a portion of the umbilical cord that was seen through the introitus. The examining physician's hand was placed inside of the vagina and manually elevated the fetal head to prevent compression of the umbilical cord. Nursing staff, anesthesia and pediatrics were immediately notified and patient was taken to the operating room. The time from speculum examination to the incision was approximately forty minutes due the patient acutely decompensating while receiving spinal anesthesia resulting in a very difficult intubation in which another anesthesiologist had to be called in order to assist. In addition, the first assistant was delayed by traffic. Delivery of the baby was rapid and uncomplicated with the birth of a live male who was five pounds and fourteen ounces. He had APGAR scores of nine and nine. After delivery of the placenta, the uterus remained boggy despite forty milligrams of Pitocin given intravenously. Hemabate[®] was then given directly into the uterus and the hemorrhage resolved. Complete blood count taken before the cesarean section returned at 5.5 and patient was transfused 2 units of packed red blood cells as she had already been typed and screened upon arrival. Patient was transferred to the ICU and monitored closely overnight. She was extubated the next day and transferred back to the Maternity Ward. The rest of her post-partum course was unremarkable and she was discharged to home on post-operative day number three.

Discussion of Practice Guidelines

The umbilical cord supplies oxygenated maternal blood to the fetus during the pregnancy. The cord begins to develop between the fourth and eighth weeks of gestation and during the final stages of development, it becomes a single stalk. This stalk lengthens to allow for fetal movement and it is surrounded by Wharton's Jelly which provides lubrication to prevent creasing. When umbilical cord prolapse occurs, the body of the fetus can compress the cord causing the amount of oxygenated blood going to the fetus to decrease.^{2,4} While the actual cause is unknown, two mechanisms have been proposed. One mechanism is thought to be due to the high force flow during rupture of the membranes. The other mechanism is due to disengagement of the umbilical cord through manual vaginal maneuvers including but not limited to placement of fetal scalp electrodes, external cephalic eversion, amnioinfusion or intrauterine balloon catheter.¹

Risk factors include low birth weight, prematurity, polyhydramnios, and malpresentation. The risk of cord prolapse is four times more likely to occur with breech presentation and nine times more likely to occur in transverse presentation. Additional risk factors include multiparity and low lying placenta, which were both present in the above mentioned case. In previously reported cases, fetal bradycardia and/or variable decelerations were also present along with overt or occult presentation of the umbilical cord. Overt presentation is when the umbilical cord extends beyond the cervical os and occult presentation is when the umbilical cord does not extend beyond the cervical os. It is important to note that in the above mentioned case, the fetal heart tones were re-assuring (category one with an average of one hundred and forty beats per minute) throughout fetal monitoring and no decelerations were present. Differential diagnosis of this condition includes placental abruption, uterine hyperstimulation and maternal hypotension.^{1,3,5}

It is imperative for a team to be assembled that includes the physician who will perform the delivery, assistant, anesthesia, nursing staff, and pediatrics. In the event that the examining physician is not comfortable performing an emergency Cesarean Section, there are several manual maneuvers that can protect the delivery of oxygenated blood to the fetus which include but are not limited to manual elevation of the fetal head, placing the patient in either trendelenburg position, knee to chest position, and/or exaggerated Sims position. Elevation of the fetal head is a very simple maneuver that requires little manipulation and is easy to perform. However, this manual maneuver can be tiring for the person who is elevating the fetal head for an extended period of time. Placing the patient in the Trendelenburg position (patient supine with feet elevated ten to fifteen degrees above the head) can provide relief to manual elevation if the patient is already in a hospital bed or in the operating room. Knee to chest position is also effective and is the recommended position if a patient is at home and prolapse of the umbilical cord occurs.

It is important to note that in women who experience umbilical cord prolapse in a non-hospital setting, the mortality rate is almost forty percent higher in comparison to outcomes in the hospital setting, zero to three percent.¹ However, exaggerated Sims position (patient laying on their side with the top leg bent to ninety degrees) is preferred during travel to the hospital for safety reasons.³ Lastly, retrofilling the bladder to with 700 to 800 milliliters of water can decrease the amount of compression of the umbilical cord. In the event that a cesarean delivery cannot take place within an hour, a tocolytic such as the Beta-2 Agonist, Terbutaline can be given to prevent further dilatation. Funic reduction (placing the umbilical cord behind the fetal head manually) can be done as well. In very specific situations such as full dilatation of the cervix and/or if a patient is vaginally delivering twins and cord prolapse occurs after the delivery of the first twin, a vaginal delivery can be attempted. However in most studied cases of cord prolapse, the average amount of dilatation was five and a half centimeters so cesarean section is the preferred method of delivery.^{1,3}

In closing, while only twenty-three percent of family doctors perform obstetrics in their practice and only ten percent see prenatal patients, it is important as providers to educate ourselves on the dangers of this condition and to be aware of different maneuvers to improve morbidity and

mortality.⁶ It is also important to educate patients on the importance of pre-conception counseling and adequate prenatal care in order to identify any potential complications with the pregnancy as early as possible so that patients can be co-managed by an obstetrician/gynecologist and/or Maternal Fetal Medicine Specialist when indicated. For patients with many risk factors for this condition and/or women who plan a home delivery, it is also important to educate them about when to go to the hospital as early recognition can make the difference between life and death.

References

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