Decidual Exclusion Myometrial Reefing in EXIT

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Citation

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Abstract

The ex-utero intrapartum therapy (EXIT) is a procedure that provides valuable time for securing a compromised or a threatened airway in the fetus-neonate. Critical to this procedure is the maintenance of the uteroplacental circulation. Achieving complete uterine relaxation, maintaining the uterine volume and the maternal mean arterial pressure are essential to maintain the fetus on the placental circulation. We present a case of EXIT done for a fetus with a prenatal diagnosis of congenital goiter and describe a novel method of minimizing maternal blood loss during the procedure.

INTRODUCTION

The ex-utero intrapartum therapy (EXIT) is a procedure that provides valuable time for securing a compromised or a threatened airway in the fetus-neonate. Critical to this procedure is the maintenance of the uteroplacental circulation. Achieving complete uterine relaxation, maintaining the uterine volume and the maternal mean arterial pressure are essential to maintain the fetus on the placental circulation. We present a case of EXIT done for a fetus with a prenatal diagnosis of congenital goiter and describe an improvised method of minimizing maternal blood loss during the procedure.

CASE REPORT

Our patient was a 22 year old primigravida referred to our institute with a prenatal diagnosis of cystic hygroma of the fetus. She was 38 weeks of gestation with Rh incompatibility. Clinically maternal physical examination was unremarkable. Ultrasound examination by us revealed a single, live fetus in cephalic presentation with an estimated fetal weight of 2140gm. A soft tissue mass of size 6 x 6 x 5 cm in the lower part of the neck situated symmetrically in front and displacing the great vessels laterally was visualized. Colour Dopplersonography revealed the mass to be highly vascular. The head was in deflexed attitude. The amniotic fluid index was 12 cm. Apart from this mass, the fetal anatomy was normal. The placenta was posterior.

In view of the situation of the mass, a potential threat to the airway was suspected. An MRI was performed and revealed a symmetric butterfly shaped solid mass with compressed tracheal lumen subjacent to the isthmic portion of the mass. The possibility of airway compression and the option of EXIT was discussed were explained to the mother. After discussing with her spouse, she opted for EXIT.

The team consisted of two obstetricians, two anesthesiology consultants, pediatric surgeon, neonatologist and two scrub nurses. The tracheostomy procedure set was kept ready. One of the anesthesiology consultants scrubbed and was ready for intubation with 3 size endotracheal tube. With SpO2, ECG, NIBP/IBP (left radial artery), Agent monitoring, Capnography, and Gas monitoring, general anesthesia was induced with fentanyl 100mcg and thiopentone 250mg i.v and intubated with succinyl choline 100mg.We followed rapid sequence induction and intubation method. Isoflurane was used as the inhalational agent until skin incision, followed by sevoflurane. Throughout the procedure MAC of 3 was maintained. A Systolic blood pressure of more than 100mmHg was maintained throughout. One dose of mephenteramine 3mg was required. Phenylephrine infusion was kept ready.

A muscle cutting low transverse incision was used to enter the peritoneal cavity. Complete uterine relaxation was ensured and fetal presentation was confirmed. After developing the bladder flap, a 2 cm low transverse incision was made superficially. This was carefully deepened till the myometrial- decidual plane was reached. This plane was dissected gently on either side and the incision was extended laterally on either side to complete the low transverse incision of about 10 cm. Then the upper and lower flaps of the myometrial incisions were reefed with No.1 chromic catgut on an atraumatic 45mm half-circle needle with the

initial entry on the inner aspect of the flap. The angles of the myometrial incision were not sutured so as to allow them to stretch and accommodate if required during the extraction of the fetal head. Once this reefing was completed, the decidual layer was incised and we tried to deliver head without rupturing the amniotic membrane. However this could not be achieved and we had to incise the amniotic sac. The fetal head, neck and shoulders were delivered and immediately an amnioinfusion of warmed Ringer's Lactate solution was infused under pressure through a sterile infusion set inserted into the amniotic cavity alongside the fetal chest wall.

The first attempt to intubate the fetus-neonate failed due to secretions in the oropharynx. We then pulled out the right arm of the baby and connected a pulse oximeter. The saturation was 67% and fetal heart rate was 153 bpm. The second attempt to intubate was done by the senior anesthesiology consultant and it was successful. The tube was securely plastered and connected to a Jackson Rees modification of Ayer's T piece and ventilated. Peri tubal leak was appreciated indicating partial rather than total compression of the airway.

The cord was clamped and divided. The inhalational agent was cut and patient maintained on nitrous oxide and oxygen in 2:1 ratio, plus incremental doses of fentanyl and a bolus dose of midazolam 2mg. An intravenous bolus dose of oxytocin 5 units was given followed by infusion of 20 units in 500ml Ringer's Lactate. The uterus promptly responded and the placenta separated. The uterine incision edges were closed single layer continuous suturing using 1-0 chromic catgut. The estimated maternal blood loss was 600ml.

DISCUSSION

Failure to maintain complete uterine relaxation, uterine volume or maternal mean arterial pressure can result in failure of the placental bypass circulation and contribute to the failure of the EXIT procedure [1]. Uterine relaxation is usually achieved by the high concentration of inhalational agent used. An alternative method of using lower concentrations of the inhalational agent or regional anesthesia with the addition of nitroglycerin infusion with or without magnesium sulphate has also been reported [2, 3 and 4]. The uterine volume is maintained by partial delivery of fetus, and ample amnioinfusion. Maternal mean arterial pressure can drop due to various reasons such as the deep general anesthesia and the continuous bleeding from the hysterotomy site of a totally atonic uterus. Although bleeding from hysterotomy site has been rare in the literature [5], it can potentially be severe enough to force the surgical team to abandon the procedure [6]. Uterine stapling using specially designed uterine stapler has been recommended to avoid the pitfall of excess uterine bleeding [1]. We describe a method of minimizing incision related blood loss that is more economical and available in our part of the world. Care should be taken to make the incision precisely myometrium-deep. For this the myometrial-decidual plane should be defined and dissected. Maintaining this plane gives the added safety of the decidual layer during the reefing to safeguard against inadvertent puncture of the amniotic membrane. The needle insertion should be from the inner aspect (decidual aspect) of the myometrium so as to avoid inadvertent puncture of the amniotic sac. Amniotomy should be delayed as much as possible to prevent volume loss secondary to amniotic fluid leakage.

References

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