South Australian Perinatal Practice Guidelines

Cord presentation and prolapse

Introduction

- Presentation and prolapse of the umbilical cord may occur in any situation where the presenting part does not "fit" well in the maternal pelvis
- With cord presentation or prolapse, blood flow through the umbilical vessels may be compromised from compression of the cord between the fetus and the uterus, cervix or pelvic inlet
- Cord presentation and cord prolapse are life threatening obstetric emergencies that may result in fetal asphyxia or death
- Caesarean section is the safest delivery option for the viable fetus, especially in the first and early second stage of labour

Definitions

- **Cord presentation** occurs when a loop of cord lies below the presenting part of the fetus in the presence of intact membranes (Lindsay 2004)
- **Cord prolapse** occurs when the umbilical cord descends below the presenting part in the presence of ruptured membranes (usually during labour) (Kahana et al. 2004)
- **Occult cord presentation** occurs when a loop of cord lies beside the presenting part and is often related to unexplained signs of fetal compromise (deep variable decelerations of the fetal heart) in labour (Lindsay 2004)

Literature review

- The incidence of cord prolapse varies between 0.1 – 0.6 % (RCOG 2008)
- In South Australia in 2008, cord prolapse occurred in 0.1 % of all confinements (Chan et al. 2009)
- One large study reported a perinatal mortality rate of 91 / 1000. Preterm birth and congenital malformations accounted for the majority of adverse outcomes in the hospital setting and birth asphyxia was also associated with cord prolapse (RCOG 2008)
- Asphyxia may also result in hypoxic-ischaemic encephalopathy and cerebral palsy (RCOG 2008)
- A finding of cord presentation on ultrasound is associated with an increased risk of cord prolapse; however, the majority of sonographic cord presentations are not followed by cord prolapse (Ezra et al. 2003)
- A recent retrospective study reported a higher incidence of cord prolapse among women who undergo induction of labour (artificial rupture of the membranes) (Boyle and Katz 2005)
- Cord presentation / prolapse is more likely to occur after artificial rupture of the membranes or sudden spontaneous rupture of the forewaters (with malpresentation or high presenting part) than in association with a hindwater leak (Steer and Danielian 2006)

Risk factors

- Breech and other malpresentations e.g. shoulder presentation

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Cord presentation and prolapse

- Multiple gestation (usually the second born twin)
- Preterm labour + / - low birth weight < 2500 g
- Transverse, oblique and unstable lie (where the longitudinal axis of the fetus is changing repeatedly)
- High head at onset of labour + / - artificial rupture of the membranes
- Grand multiparity
- Polyhydramnios
- Abnormal placentation
- Fetal congenital anomalies

Procedure related

- Artificial rupture of the membranes
- Vaginal manipulation of the fetus with ruptured membranes
- External cephalic version

Diagnosis

- The presence of cord should be excluded during all routine vaginal examinations in labour and after spontaneous rupture of membranes where risk factors are present or if cardiotocographic abnormalities commence soon thereafter (RCOG 2008)
    - Diagnosis is usually made during a vaginal examination when the examiner feels a soft, usually pulsatile structure
    - On examination, the cord may be presenting (alongside the presenting part), or prolapsed (in the vagina or in the introitus)

Management

- The sudden appearance of large fetal variable decelerations or prolonged fetal bradycardia on the cardiotocograph in labour or after spontaneous rupture of the membranes is an indication to perform a vaginal examination to exclude or confirm the presence of cord presentation / prolapse
- Once cord presentation / prolapse is diagnosed, treat as an obstetric emergency and **summon immediate medical assistance** (obstetrician, anaesthetist, neonatologist) to expedite birth
- Discontinue oxytocin infusion if in progress
- The mode of delivery will depend on whether a fetal heart is present or absent and the stage of labour
- Explain findings to the woman and support persons including the emergency measures that may be needed
- Aim to maintain the fetal circulation by preventing / minimising cord compression until birth occurs (see below)
- Note time of diagnosis of cord presentation / prolapse and maintain a contemporaneous record of events until birth occurs

Cord pulsating

- Determine stage of labour by vaginal examination

Cervix is not fully dilated

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- Arrange immediate caesarean section
- Ensure intravenous access in place
- Obtain and send group and save
- Administer O_2 via Hudson mask at 8 litres per minute
- Ensure continuous CTG until in theatre and commencing caesarean section or until after vaginal birth
- Obtain arterial and venous cord blood gases immediately after delivery
- **The priority is to relieve pressure on the cord by elevating the presenting part** while preparations are made for emergency caesarean section. This can be achieved by:
    - **Positioning the woman** in the deep knee-chest position or on the left side with head down. Elevate the foot of the bed where possible
    - **Manually elevating the presenting part is reasonable if there is immediate access to theatre –**Insert sterile gloved fingers into the vagina to elevate the presenting part away from the cord. Avoid excessive handling of the cord
    - Acute intravenous **tocolysis** using salbutamol (see regimen below) may be an effective adjunct treatment (for tocolytic alternatives see chapter 101 tocolysis for uterine hypercontractility)
    - **Bladder filling:** In cases where a delay in transfer to theatre for caesarean section is expected – consider elevation of the presenting part through rapid instillation of sodium chloride 0.9 % (at least at room temperature) into the maternal bladder (by inserting the end of a blood giving set into a Foley catheter). Position head down in left lateral position before passing urinary catheter. Clamp the catheter once 500 – 750 mL has been instilled. Ensure the bladder is emptied before any delivery attempt
    - If a delay in transfer to theatre is expected and the pulsating cord is prolapsed outside of the vagina, a pad soaked in warm saline (sodium chloride 0.9 %) may be used to cover the cord. There is insufficient data to support replacement of the cord within the vagina (RCOG 2008)

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Obstetric salbutamol: 5 mL ampoule 5 mg / 5 mL
Dosage and administration > Using a 1 mL syringe, draw up 0.25 mL (250 micrograms) of salbutamol > Add to a 10 mL syringe and make up to 10 mL with sodium chloride 0.9 % (25 micrograms per mL) > Give intravenous salbutamol slowly in 50 microgram boluses up to 250 micrograms in total (often 100 micrograms will be sufficient) > **Ensure monitoring of maternal pulse whilst bolus doses are administered** > **Stop IV administration if maternal pulse > 140**
Side effects > Fetal and maternal tachycardia, maternal hypotension, ventricular ectopics, supra-ventricular tachycardia, ventricular fibrillation, pulmonary oedema, hypoxia – secondary to increased oxygen demands + / - fluid shift in lungs, hyperglycaemia

Anaesthetic and theatre management

- The aim should be to deliver the baby as soon as possible in a manner that provides for safe anaesthesia for the mother
- A focused anaesthetic assessment of the woman must be conducted before anaesthetising the woman
- If the woman has a working epidural in place, there may be time for this to be topped up, by the anaesthetist, either before or en-route to theatre, thus avoiding general anaesthesia
- Although expeditious spinal anaesthesia has been performed in cases of cord presentation, the majority of caesarean sections, where there is no epidural in-situ, are performed under general anaesthesia
- It is a high priority to move the woman to the operating room:
    - Depending upon local circumstances, some procedures e.g. intravenous cannulation, obtaining group and save and urinary catheterisation can be delayed until the woman is in the operating theatre
    - The usual prophylaxis to prevent the adverse effects of the aspiration of gastric contents should still be given to the woman, e.g. sodium citrate plus ranitidine
    - A “Team Time-Out” should occur before commencing surgery. In many cases, the immediacy of the situation leaves little time for documentation of consent before surgery

Second stage of labour

- If the woman is in the second stage of labour and vaginal birth is feasible with the presenting part at or below spines, the doctor should prepare for operative delivery (vacuum extraction or instrumental)

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- If immediate vaginal delivery is not feasible, expedite delivery with caesarean section
- Obtain arterial and venous cord blood gases immediately after delivery

Cord not pulsating

- Confirm fetal death with ultrasound scan
- Allow labour to proceed as for vaginal birth of fresh stillbirth

Counselling

- The woman and her significant support persons should receive ongoing explanation to ensure the woman's informed cooperation
- In the case of planned immediate caesarean section, the woman will require a general anaesthetic unless a functional epidural is already in place. Explain that the support person may not be able to attend the theatre in this situation

Communication with women and their support people during caesarean section

- It is important that staff counsel any support persons who are unable to be present in theatre for the emergency caesarean section about the need for immediate intervention to optimise fetal outcomes

Postpartum follow up

- Staff involved in the care of the woman should follow her up in the postnatal period. This may help clarify the sequence of events related to the cord prolapse / presentation and provide the woman with an opportunity to ask any questions

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Abbreviations

ed.	Edition
EFM	External fetal monitoring
e.g.	For example
et al.	And others
g	Gram(s)
>	Greater than
IDC	Indwelling urinary catheter
IV	Intravenous
mg	Milligram(s)
mL	Millilitre(s)
%	Percent
+/-	Plus or minus

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