CLINICAL PRACTICE GUIDELINE
Guideline coverage includes NICU KEMH, NICU PMH and NETS WA

Gastroschisis

This document should be read in conjunction with the Disclaimer

Also refer to NETS WA Clinical Guidelines, Surgical Problems.

Gastroschisis is a congenital anomaly characterised by a full thickness abdominal wall defect, usually just to the right of an intact umbilical cord, through which a variable amount of intestine protrudes without a covering membrane; other abdominal viscera like liver, spleen, gonads etc. may also protrude. The size of the abdominal wall defect is variable; small defects are a concern and may cause significant bowel ischaemia.

The term 'Vanishing Gastroschisis' is used to describe the apparent foetal ultrasonic reduction and disappearance of exteriorised bowel due to the abdominal wall defect spontaneously closing, leading to significant bowel ischaemia and short bowel syndrome.

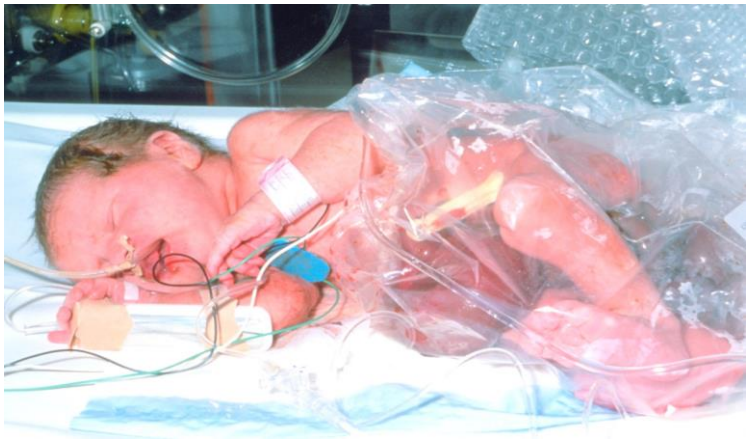
Management at Birth

Liaise with the Paediatric Surgeons and PMH NICU

Alert PMH NICU and the on call paediatric surgical team **well before delivery**. PMH NICU may need to make room for the admission by moving existing patients and the paediatric surgeons may wish to be present soon after delivery in order to place the exposed bowel into a silo before the baby is transferred to PMH NICU.

Management at Birth in Labour Ward

- Standard neonatal resuscitation as per NRP guidelines.
- **Double bagging:** the first bag covers the legs and lower abdomen i.e. laces up just below the exposed bowel to prevent the bowel being soiled by urine and meconium; and the second bag covers the first bag and exposed bowel and laces up above the bowel close to the axilla (cling film can be loosely wrapped around the baby when a bowel bag is not available). This protects the bowel and reduces heat and fluid losses and allows for ongoing careful inspection of the bowel for discolouration**. Lay the infant on the right side for transport to NICU.**



- Insert size 8Fg oro-gastric tube and fully aspirate the stomach contents and leave on free drainage.

On Admission to SCN3 at KEMH and/or PMH

- Immediately upon admission to NICU, contact PMH NICU, NETS WA and the surgical team and confirm that delivery has occurred (see above). If the surgeon is unable to attend the infant at KEMH, arrange for transfer to PMH NICU as soon as the infant is stable for transport.
- Nurse the infant under a radiant warmer. The infant's legs and torso should remain inside the impermeable bowel bags in order to limit fluid and heat loss from the bowel and also to allow easy inspection of the bowel and help protect the bowel and limit the risk of sepsis.
- Insert size 8Fg oro/nasal gastric tube if not inserted at delivery and fully aspirate the stomach contents and leave on free drainage.
- Watch bowel colour and report any discolouration that develops; repositioning the bowel relative to the abdominal opening maybe necessary if the bowel becomes dusky. Request an urgent surgical review if there is no improvement in bowel colouring.
- Insert an IV and commence maintenance fluids (7.5 to 10% glucose) at 80 mL/kg/day in neonates > 37 weeks gestation and 100 mL/kg/day in preterm infants. **In addition**, commence an infusion of **Normal Saline at a rate of 10 mL/kg/hr**. The Normal Saline infusion should continue until the surgeons apply a silo or until a formal reduction of gastroschisis is achieved (whichever happens first).

  Once the Silo is applied make sure to stop the Normal Saline infusion.
- It may be necessary to continue the Normal Saline infusion or give additional boluses of Normal Saline if hypo-perfusion, hypotension or metabolic/lactic acidosis is present. Consider early use of Dopamine or Dobutamine if no improvement in spite of the Normal saline infusion.
- Give IV prophylactic antibiotics Benzyl Penicillin/Gentamicin/Metronidazole after collecting blood cultures.
- Examine the infant for associated anomalies.
- FBC, blood group and hold or cross-match, blood gas, blood culture. **Ensure that 10mLs of clotted maternal blood for cross-matching is collected.**
- Once the baby is stable transfer to PMH NICU.

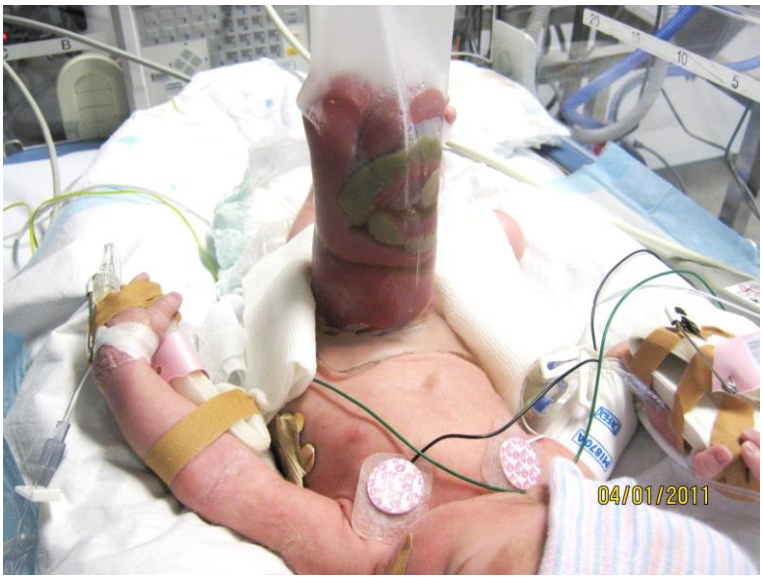
Management of neonates with gastroschisis during transport

refer to NETS WA Clinical Guidelines

The general management of a gastroschisis infant with a silo

- Nil oral and keep the stomach on free drainage with a large bore catheter.
- Early maintenance parenteral nutrition to ensure adequate weight gain and metabolic balance.
- Extra IV fluids will be required if gastric losses are greater than 10 mLs/kg/12hour period. The total fluid loss in the previous 12 hour period should be replaced (half as TPN solution and half as Normal Saline via a side line). Refer to Replacement of Gastrointestinal Fluid Losses in Surgical Neonates.

- Surgeons will gradually reduce the intestinal contents as the baby's condition permits; usually over 2-5 days.
- Carefully observe the bowel for discolouration. Normal bowel in silo should look pink. Grey, purple or black looking bowel indicates vascular compromise. Areas of 'peel' may be present and appear discoloured. This situation should be reviewed by senior neonatal staff.



Post-operative management following complete closure, either after silo or after primary closure

Some infants may not adapt quickly to the extra amount of gut which has been reduced into the abdominal cavity. This could result in compression of the mesenteric blood vessels leading to ischemia of the bowel. This is called "**abdominal compartment syndrome**". If this is not diagnosed and treated quickly, it can have catastrophic consequences, such as necrosis of the bowel. One or more of the following clinical features should suggest the possibility of abdominal compartment syndrome:

- A significant increase in ventilator pressures compared to the pre-reduction pressures.
- Tense and possibly tender abdomen.
- Discolouration of abdominal wall and lower limbs.
- Very high morphine requirements.
- Progressive worsening of metabolic and or respiratory acidosis, high lactate levels.
- Hypotension requiring inotropic support.
- Decreased or absent urine output.

If one or more of these clinical features develop, you should seek an urgent senior neonatal review before contacting the surgical team.

Pain Management

Analgesia should be provided as needed., preferably with intravenous Paracetamol or Morphine. A balance should be maintained between effective analgesia and side effects of opiates on respiratory depression and gut motility. Normally infants with a silo do not require significant analgesia. If an infant needs high dose morphine infusions, it should alert the clinicians to the possibility of bowel ischemia.

Fluid and electrolyte balance

Frequent blood gas and electrolyte measurements (6-12 hourly) should be performed to guide fluid therapy. Blood pressure, capillary refill, pulse rate, colour, amount of gastric aspirates and urine output should be taken into consideration in adjusting fluid therapy.

Gastric Losses

Refer to Fluid replacement therapy for surgical neonates

A large bore gastric tube (size 8 or 10Fg) on free drainage with 1-2 hourly gentle aspirations is needed to prevent gastrointestinal distension caused by post-operative ileus and the reduction process. Monitoring and replacement of losses is necessary as some infants can lose very large volumes of stomach fluids. Losses are generally replaced as half normal saline, but are tailored to the baby's electrolyte status. In some cases, this may last for weeks until gut motility improves.

Decreased urinary output

A decrease in urine output may be due to renal venous compression as a result of the raised intra-abdominal pressure or an inadequate intravascular volume (due to inadequate fluid loss replacement or 'third' spacing). **Bladder retention** is a frequent problem, often as a side effect of morphine analgesia. A urinary catheter may be necessary.

Nutrition

Consider early placement of a percutaneous long line. Parenteral nutrition should be started as soon the baby is stable after birth. Enteral feeding will not start until the abdominal wall defect has been closed and gastric aspirates are reducing. Trophic feeds are often given even when there are relatively large gastric aspirates, decided on a case by case basis. Enteral feeds are increased as tolerated; as judged by the amount of gastric aspirates/vomits, abdominal distension and bowel actions. Gut dysmotility can persist for weeks after gastroschisis closure and longer term TPN may be needed to supplement inadequate enteral intake. Early initiation of enteral feeding has been shown to improve the gut function in babies with gastroschisis. Occasionally a prokinetic agent may be helpful in promoting gut motility.

Antibiotics

Antibiotics are routinely started immediately after birth and usually continued until the abdominal wall defect is closed. Routine antibiotics are Benzyl Penicillin, Gentamicin and Metronidazole. Vancomycin is frequently added if there is significant abdominal wall redness. It is reasonable to monitor CRP levels whilst on antibiotics.

References

1. Davies MW, Kimble RM, Woodgate PG. Ward reduction without general anaesthesia versus reduction and repair under general anaesthesia for gastroschisis in newborn infants. The Cochrane Database of Systematic Reviews 2002, Issue 3
2. Williams, T, Butler, R, Sundem, T. (2003). Management of the Infant with Gastroschisis: A comprehensive review of the literature. Newborn and Infant Nursing Reviews. 3 (2): 55-63.
3. Principles and Practice of Pediatric Surgery, 2nd Edition. Ch 69 Abdominal Wall Defects. R Minkes. Available from CAHS library as eBook.

Related WNHS policies, procedures and guidelines

NETS WA Clinical Guidelines

NETS WA Clinical Guidelines: Surgical Problems

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