Exit Procedures

An Anaesthetic perspective

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“We play as a team and we do it my way!”

Richie Benaud, The Twelfth man.
A Brief History of Exit

Indications for Exit procedure

• Masses of head and neck
• Craniofacial anomalies with mandibular hypoplasia
  – With other evidence of aerodigestive obstruction such as polyhydramnios, tracheal compression
• Laryngeal/tracheal atresia, CHAOS
• Lung masses, mediastinal masses, pulmonary outflow obstruction, HPLH, Diaphragmatic hernia. Exit to ECMO
Amniotic fluid flux

Pre-procedural investigations/consultation

• Prenatal detection of foetal malformation
• Further Imaging/?Amniocentesis
• Multidisciplinary consultations
• Neonatology/paediatrician, Geneticist, Surgeons, ENT, Plastic and reconstructive, Anaesthetists.
• Formulate plan with family
  – Not Proceed with pregnancy
  – Proceed with pregnancy and schedule EXIT
  – Proceed with pregnancy and not have extraordinary resuscitative efforts at birth
Case presentation

- Mrs TP, G5 P2, aged 49 years referred to Westmead feto-maternal unit at 28 weeks gestation with fetal micrognathia and polyhydramnios on US.
- Co-morbidities: Hypertension, Cutaneous SLE, Thyrotoxicosis, diet controlled gestational diabetes
- Medications: prednisolone, hydroxychloroquine, oxprenolol, carbimazole
Mandible / airway – larynx & trachea
foetal MR T2 weighted
Assembling the team

• Obstetrician
• Neonatologist
• Anaesthetists
• Paediatric surgeons, ENT, General, Plastic
• Nursing staff
Obstetric management

- Plan delivery day!
- Amnio-reduction day prior
- Ultrasound to check fetal position and placental position.
- Lower segment hysterotomy? Classical for breech or placenta praevia.
- Haemostatic clips during hysterotomy
- Delivery of head, shoulder, arm.
- Warm saline infusion to maintain uterine volume
Maternal Anaesthesia Goals

- Relax uterus, prevent placental separation
- Maintain utero-placental perfusion
- Anaesthetise/sedate/immobilise foetus
- Rapid return of uterine tone after delivery
- Minimise blood loss, transfusion requirements
Monitoring the foetus

- Doppler US
- Delivery of one arm and application of pulse oximeter
- IV access for fetus
- ?cardiac ultrasound
Anaesthetising the mother
General Anaesthesia

- High dose volatile anaesthetic
- GTN
- Remifentanil
- Arterial monitoring
- Vasopressors
- Cell saver
Anaesthetising the mother
Regional Anaesthesia

- CSE
- GTN
- Remifentanil

Volatile and Foetal cardiac dysfunction


Preparing the room
Photo of theatre crowded with multiple teams.
Establishing an airway

• Micrognathia
  – Confirm very difficult/impossible intubation
  – Tracheostomy

• Head and neck masses
  – Laryngoscopy/video-laryngoscopy/rigid bronchoscopy
  – Tracheostomy
  – Tumour resection with tracheostomy
  – Use of ultrasound to identify the trachea

• Fibreoptic scope to confirm tube position

• Over to neonatology
Series of 3 slides showing intubation and tracheostomy on placental support. Followed by 2 slides showing babies with micrognathia and large neck mass with tracheostomies in situ.
Neonatal resuscitation

- Full range of neonatal resuscitation equipment required
- Resuscitative sedative and resus drugs and fluids according to estimated babies weight
- Umbilical catheters
- Chest drains
3D CT
Slide of Mrs TP nursing baby with tracheostomy in situ.
Maternal outcome

• Increased blood loss
• Increased wound infection rate
• No mortality reported
• No increased hospital stay.

<table>
<thead>
<tr>
<th>Case</th>
<th>Mass</th>
<th>Micrognathia</th>
<th>Other</th>
<th>Hydramnios</th>
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<tr>
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<td>Easy intubation</td>
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<td>6</td>
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<td>7</td>
<td>Treacher Collins</td>
<td></td>
<td>++</td>
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<td>Difficult, rigid bronch, early tracheostomy</td>
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<td>Easy intubation</td>
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<td>Easy intubation</td>
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<td>Easy mask ventilation, Mod difficult intubation</td>
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<td>Severe with microstomia</td>
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<td>++</td>
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<td>Tracheostomy</td>
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</table>
Micrognathia and EXIT

• 3 cases in Westmead experience
  – Treacher Collins
  – Multiple Congenital anomalies, died in neonatal period after life sustaining measures withdrawn
  – Isolated micrognathia, tracheostomy, tube feeding, alert and growing. Awaiting reconstructive surgery.
Fig. 1  Fetal MRI in the coronal (A) and sagittal (B) planes of a patient with fetal CHAOS (case no. 12). Note the atretic laryngeal segment (white arrows). This lesion measured 7 mm and was deemed a poor candidate for fetal tracheoplasty.


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CHAOS and EXIT

• “The overall prognosis for pregnancies complicated by CHAOS remains poor, however, and the long-term medical and surgical challenges for survivors remain numerous even after lifesaving fetal intervention” and “these are some of the sickest kids you are ever going to have to take care of, and their long-term outcome is still significantly challenged even after you are able to get them to survive”.
EXIT is only the beginning
Emily’s story

• Photo of Emily, aged 6, child with Treacher-Collins syndrome and her mother
Acknowledgements

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