Safe Airway Management in Massive Occipital Encephaloceles: A Practical Approach

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Introduction

- Encephalocele- a neural tube defect of the cranium
- Rare (1 in 12,000 live births)
- Presents as an outpouching of a meninges-lined sac filled with CSF.
- Mass can varies in both size and location
- Treatment involves neurosurgical intervention
- Untreated, complications include: mass enlargement, meningitis and neurological decline.
- Surgery occurs most commonly in the neonatal period.
- Challenging airways
- Previously-described positioning strategies: lateral position[1,3], hanging the patient's head over surgical table, [2] and having assistants elevate the baby's body while anesthesiologist manages the airway.[3]
- Concomitant mid-face hypoplasia including microcephaly
- We propose the safest approach to airway management is to support a natural and familiar supine airway position.

Pro-Con: Airway Positioning for Posterior Encephaloceles

Positioning Technique	Pros	Cons
Lateral Decubitus	• Minimizes trauma to and manipulation of mass	• Unconventional laryngoscopy position • challenging to convert to supine • Limited options for a plan B
Head Hanging off Bed	• Conventional laryngoscopy position (supine)	• Gravity induced trauma to mass • Immobilized head
Body Suspended by Support Staff	• Less trauma to mass • Supine • Control of neck extension/flexion	• Awkward • Communication errors may be devastating • Potential to drop child

Case Report

Pre-Op

Pt

3yo -full term

10kg boy

PMhx

- Seizure d/o
- Developmental delay
- FTT
- Posterior encephalocele
  - "uncurable, unresectable"
  - At birth: <1 yr life expectancy
  - Palliative care

Exam

- Vitals Normal
- Normal CV + Pulm
- Midface hypoplasia
  - Micrognathia
  - macroglossia

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Airway Management and Positioning

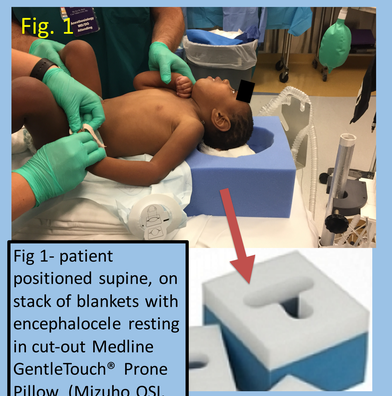


Fig 1- patient positioned supine, on stack of blankets with encephalocele resting in cut-out Medline GentleTouch® Prone Pillow (Mizuho OSI, Union City, CA) with custom cut-out for the encephalocele

Fig 2- Easy mask & intubation (grade 1 view, phillips 1 blade) with familiar supine positioning, without trauma or compression of encephalocele

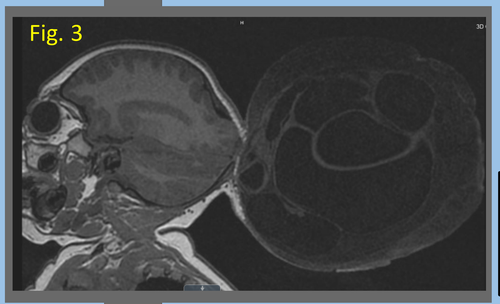
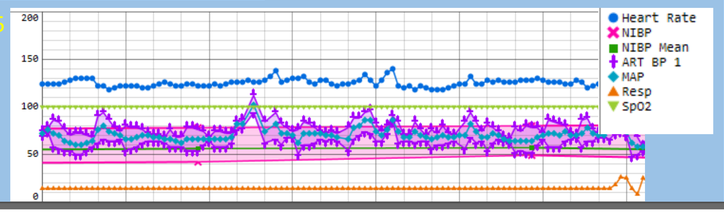


Figure 3- pre-op MRI demonstrating massive posterior encephalocele (15cm wide). Figure 4- Patient in surgical position demonstrating the exposed extracranial mass. Figure 5- intra-operative record (EPIC). Stable hemodynamics throughout the case.



Post-Op

- Extubated POD 1
- Periop Diabetes insipidus- resolved quickly
- Hydrocephalus -> VP shunt
- VP shunt infection
- Discharged home HD 43
  - Following-up w/ ID
  - At neurological baseline

Discussion

- Encephaloceles vary in their size and severity, and afflicted patients have inherently high-risk airways.
- Airway management in these patients requires a thoughtful evaluation of the risks and benefits of several positioning options.
- We encourage those caring for these patients to consider creating a familiar supine airway position using commonly-found materials
- Minimizing potential trauma to the encephalocele is the safest approach to airway management for these delicate patients.

References

1. Goel, V., et al. (2010). Indian Journal of Anaesthesia, 54(5), 477.
2. Walia, B., et al. (2005). Med J Armed Forces India, 61(3), 293-294.
3. Yıldırım, Z. B., et al. (2011). Journal of Neurosciences in Rural Practice, 2(2), 159-161. doi:10.4103/0976-3147.83583