ANAESTHETIC MANAGEMENT OF A PARTURIENT WITH AN UNCORRECTED CHIARI MALFORMATION

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INTRODUCTION

- Chiari malformations (CM) constitute an array of congenital neurological structural abnormalities
- Classified into four types

CHIARI I
>5mm descent of cerebellar tonsils beyond foramen magnum.

CHIARI II
Brainstem, Fourth Ventricle, >5 mm descent of cerebellar tonsils + spina bifida.

CHIARI III
Cerebellar herniation through a posterior encephalocele.

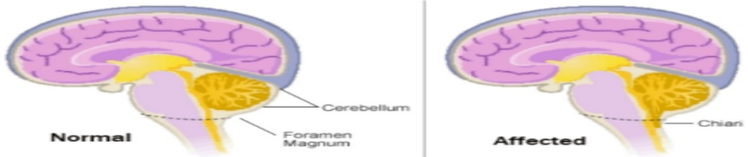
CHIARI IV
Cerebellar hypoplasia/ aplasia

MOST COMMON → **UNCOMMON** → **VERY RARE**

- Usually **diagnosed** by an MRI
- **Symptoms :** range from headache, paresthesia, incoordination etc., to no symptoms at all
- Syringomyelia and hydrocele are present in 30% and 10% cases of type I CM, respectively

CASE DESCRIPTION

- 25-year-old G1P0, BMI = 26.4 kg.m^{-2} planned for elective caesarian section at 39 weeks.
- **PMH** – s/o primary hypothyroidism, an allergy to erythromycin, **TYPE I CM**
- Former **clinical presentation** - intermittent headache + nausea and vomiting – 5 years ago.
- **MRI:** cerebellar tonsillar descent of 5 mm below the foramen magnum. An apparent focus of low signal change in the left aspect of the pituitary gland. Her biochemical parameters for pituitary function = normal.
- **Neurosurgical consult** → Either general or epidural anaesthesia were deemed safe for her



ANAESTHESIA CARE

PRE-OP

No Clinical features s/o raised ICP at present
On Examination: Airway & Lumbar spine: NAD

❖ Patient insisted on staying **AWAKE !**

Decision: **SPINAL ANAESTHESIA**

INTRA-OP

- **Technique:** U/S guided – sitting position - Consultant anaesthetist - 27 G Whitacre needle – single pass
- **Block:** T4->S2, Bromage grade 1 B/L
- **Amount:**12mg 0.5% Heavy - Bupivacaine+300µg diamorphine
- **Routine:** Antibiotic prophylaxis+ preemptive phenylephrine infusion + Oxytocin

Uneventful surgery

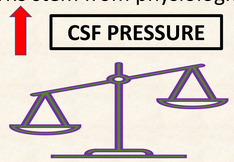
POST-OP

No neurological abnormalities on F/U day 1,2

DISCUSSION

- **PATHOPHYSIOLOGY:** Concerns stem from physiological implications of pregnancy & anatomical consequences of CM

PHYSIOLOGY
Pregnancy & Labour



ANATOMY
Herniated tonsils of CM
CSF outflow from brain to spinal cord
CSF pressure in cranium > pressure in spinal canal

ANAESTHETIC OPTIONS

GA	EPIDURAL	SPINAL
Benefit	**Benefit**	**Benefit**
• Able to manage increases of ICP intra-op	• Stay Awake	• Stay Awake
Risk	**Risk**	**Risk**
• Laryngoscopy, intubation & extubation can inc. ICP • Syringomyelia (associated with typeI CM) relative inc. sensitivity to NDMR	• Inadvertent dural puncture with 18G needle can lead to catastrophic cerebellar herniation • ***Hilt et al.*** showed an inc. in ICP from baseline following epidural administration	• Theoretically, can cause further descent of cerebellar tonsils.

CONCLUSION

- Our patient firmly expressed a desire to stay awake during the procedure & displayed no active signs of elevated ICP, we chose to employ a single shot spinal anaesthesia
- Crucial to gauge severity of the CM by a recent MRI & conduct of a physical examination
- The ultimate choice on anaesthetic management should involve a discussion with the neurosurgeon, obstetrician, anaesthetist, and patient. -> An individualised approach tailored to the parturient should be adopted for better outcomes.

REFERENCES:
1. Ghaly RF et al Surgical neurology international. 2017;8.
2. Gruffi TR et al International journal of obstetric anesthesia. 2019 Feb 1;37:52-6.