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Feticide for Fetal congenital malformation: a case presentation

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Outline

- Introduction
- History
- Discussion
- Summary

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Introduction

- Myelomeningocele is the commonest neural tube defect *(Bowman, 2024)*
- Caused by failure of primary neurulation
- Incidence is highly variable (<1-7 per 1000 live births) *(Blencowe, 2018)*
- Incidence depend on ethnicity, geography and nutritional factors
- In Africa, prevalence quoted pooled burden of 32.95/10,000 births, highest in East Africa with 111.13/10,000 *(Zaganjor, 2016)*

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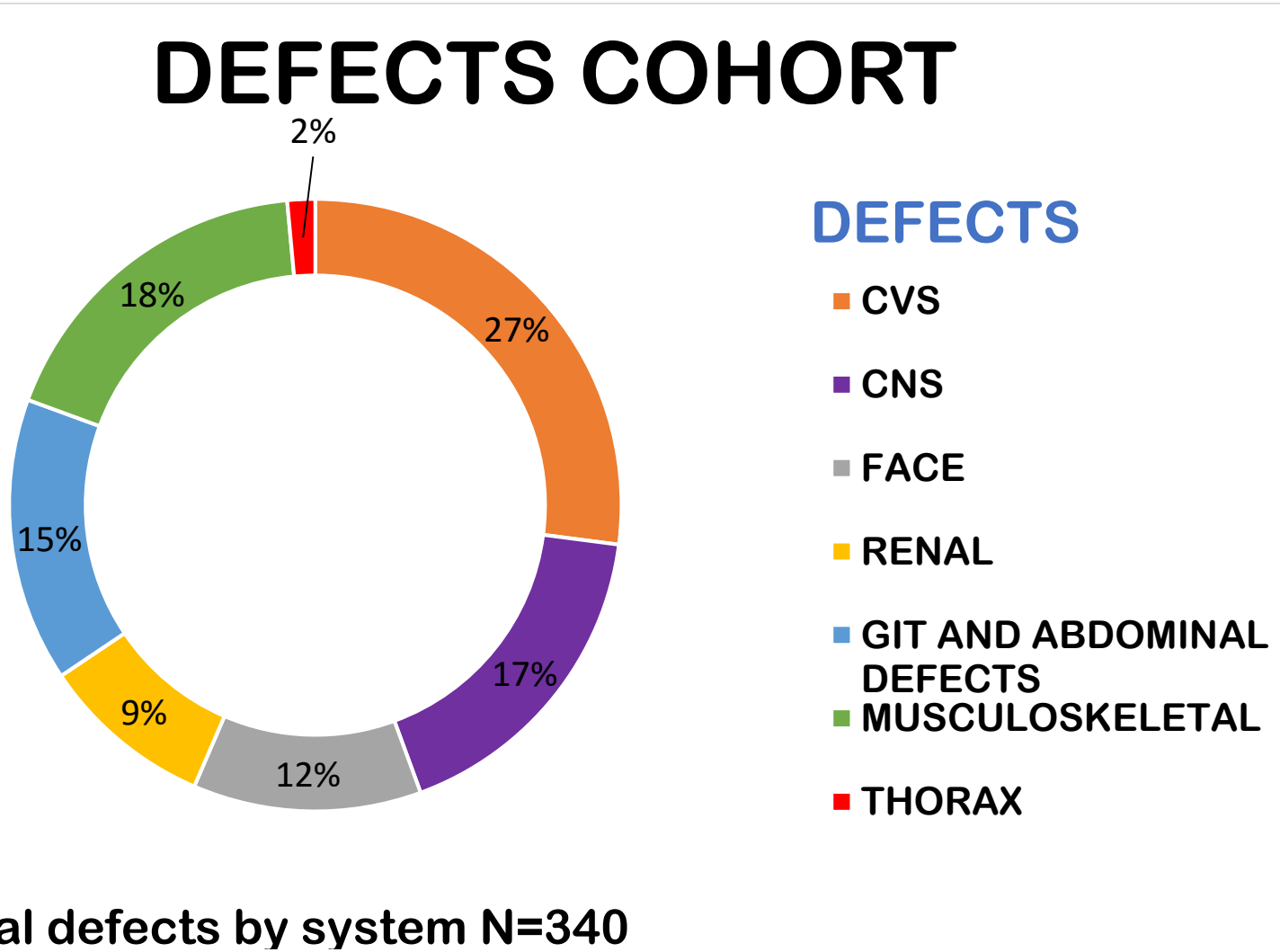
DEFECTS COHORT

- 9513 pregnancies
- 176 fetuses with defects
- Total defects=340
- Incidence 2 per 100



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FMU CENTRAL NERVOUS SYSTEM

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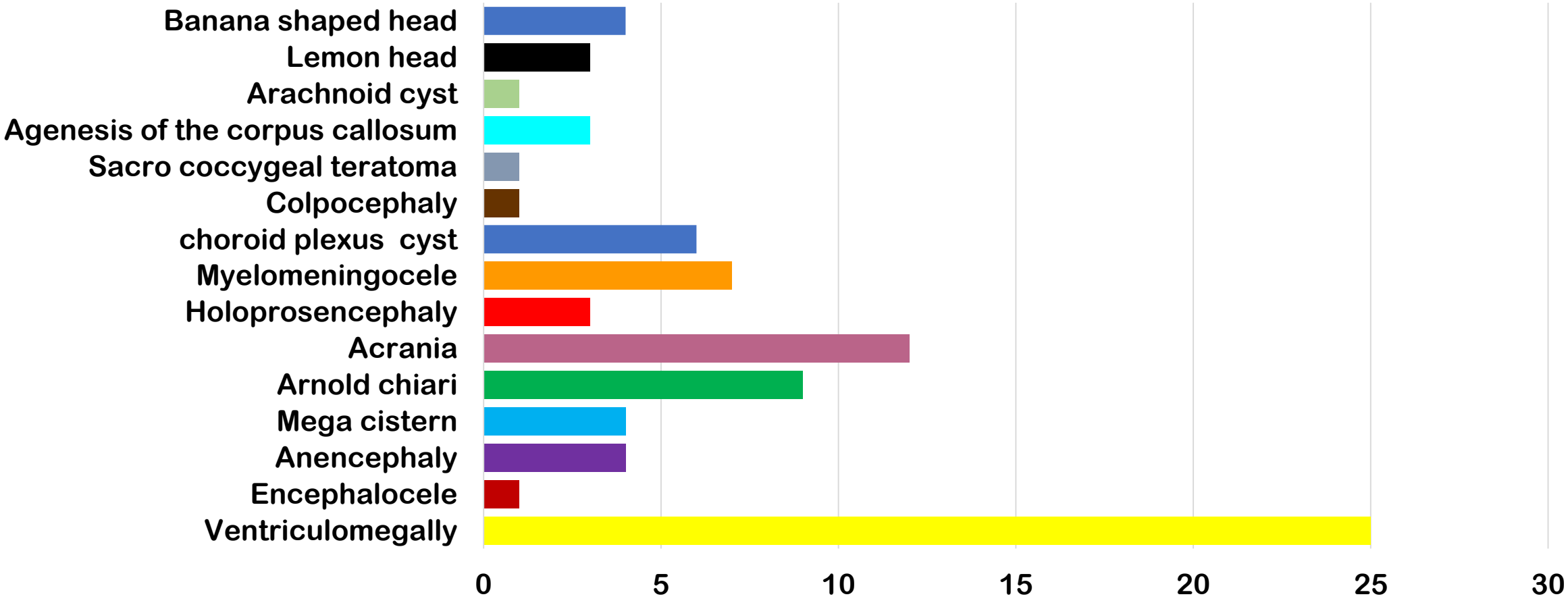
CENTRAL NERVOUS SYSTEM (N=59)



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History

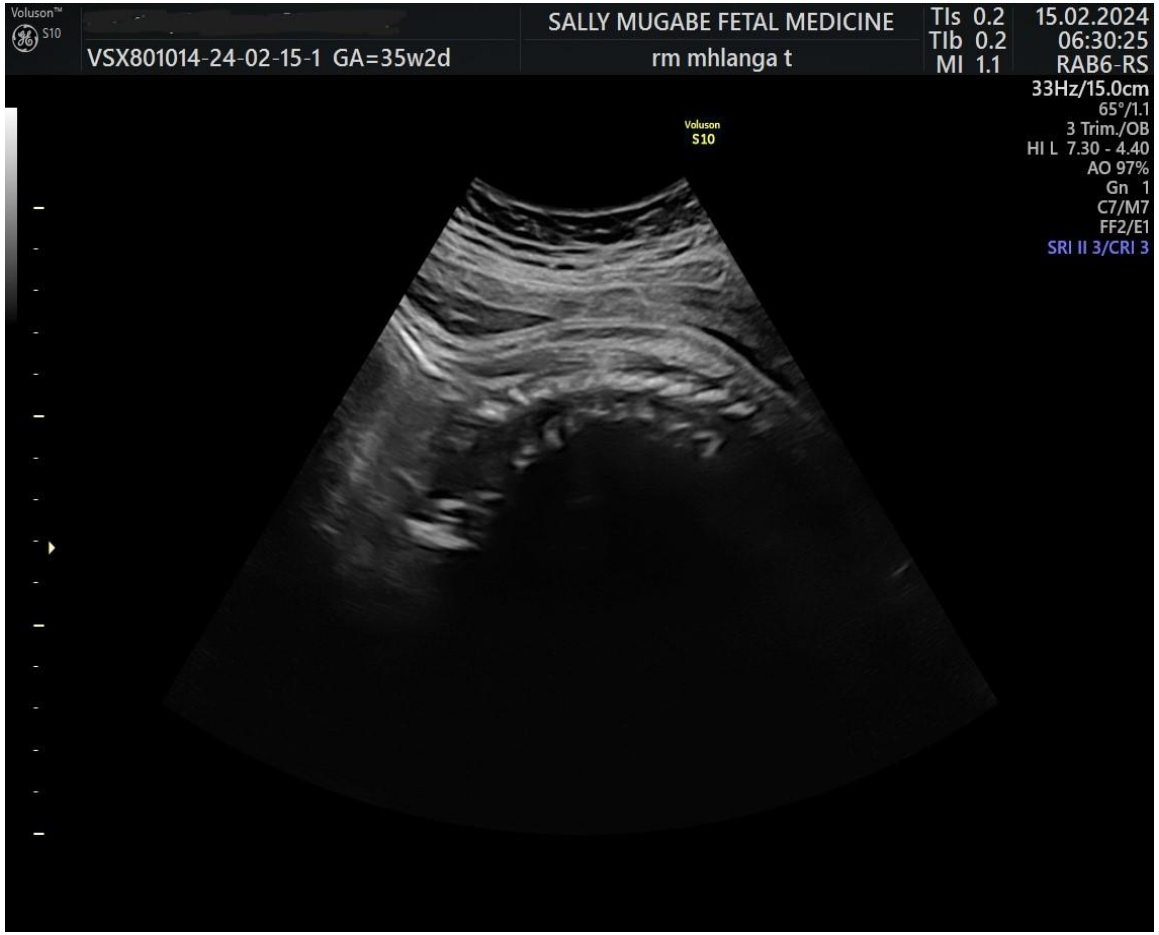
- Mrs. PFM, waitress, married
- 36 year old, P2G3
- Referred @ 32 weeks + 2 days
- No personal or family history of fetal abnormalities.
- Presented in FMU @ 34 weeks for a 2nd opinion scan
- 2 children at home alive and well
- No preconception visit
- Preconception folate not taken
- Planned pregnancy
- First trimester scan done: NT 1.4 mm, nasal bone present, CRL 39.4mm;
- No biochemical tests done
- BS to BSOB ratio not done at T1 scan.
- Booked @ 16 weeks
- No fetal anomaly scan done
- TORCH screen not done

Examination

BMI 28kg/m2

CVS, RS, CNS – unremarkable

Abdomen- HOF 34cm, cephalic, longitudinal lie and regular fetal heart rate



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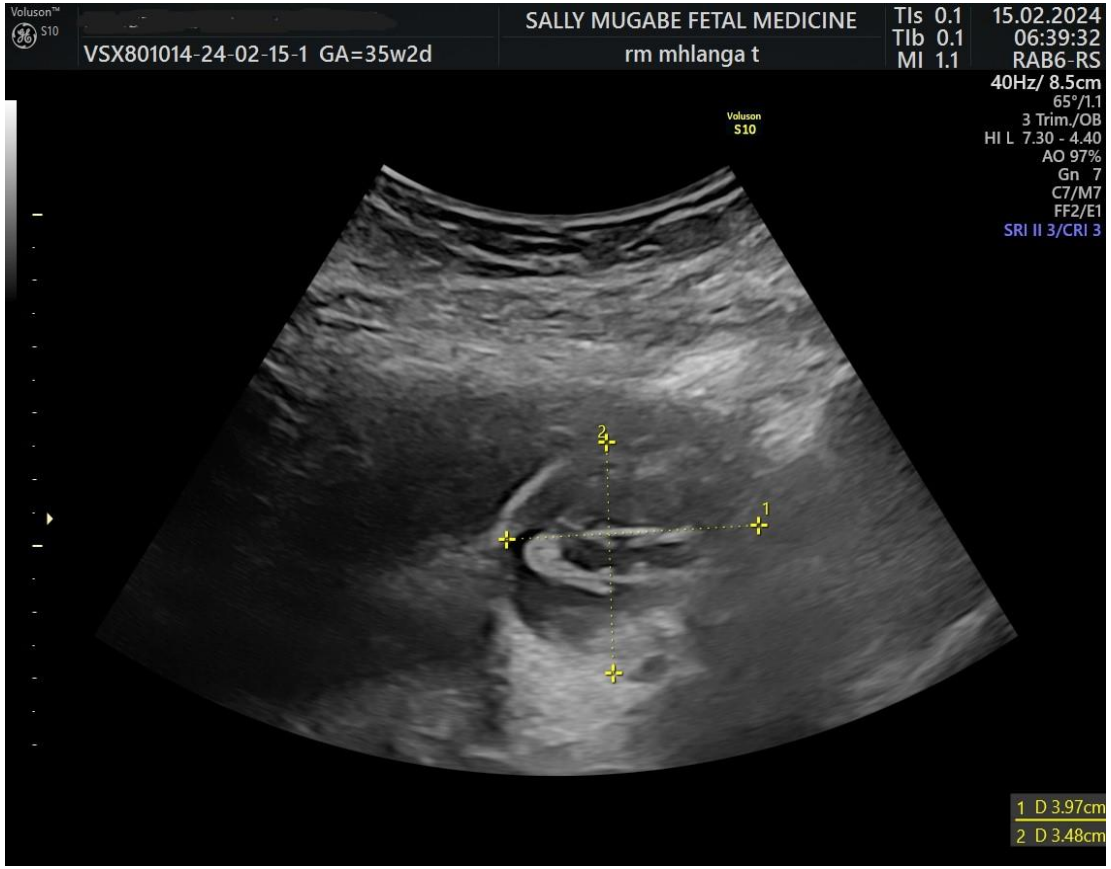
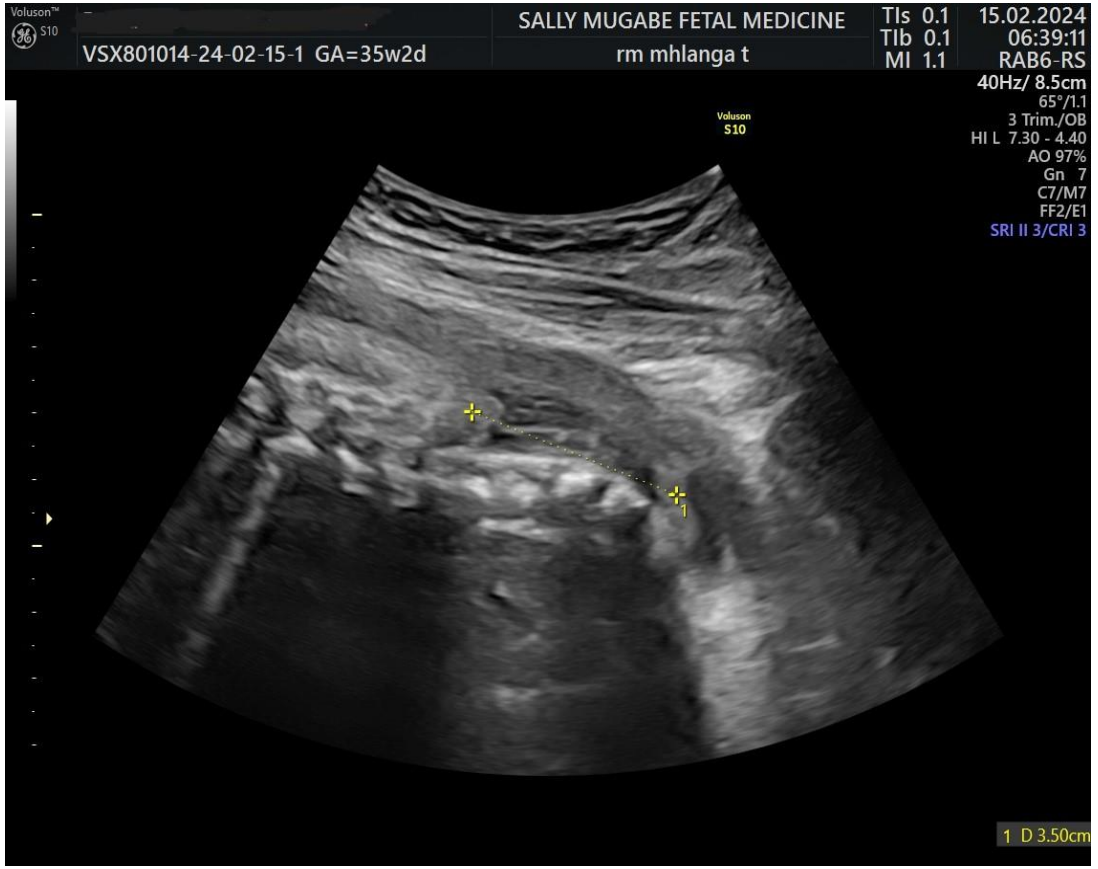
Sacrococcygeal defect





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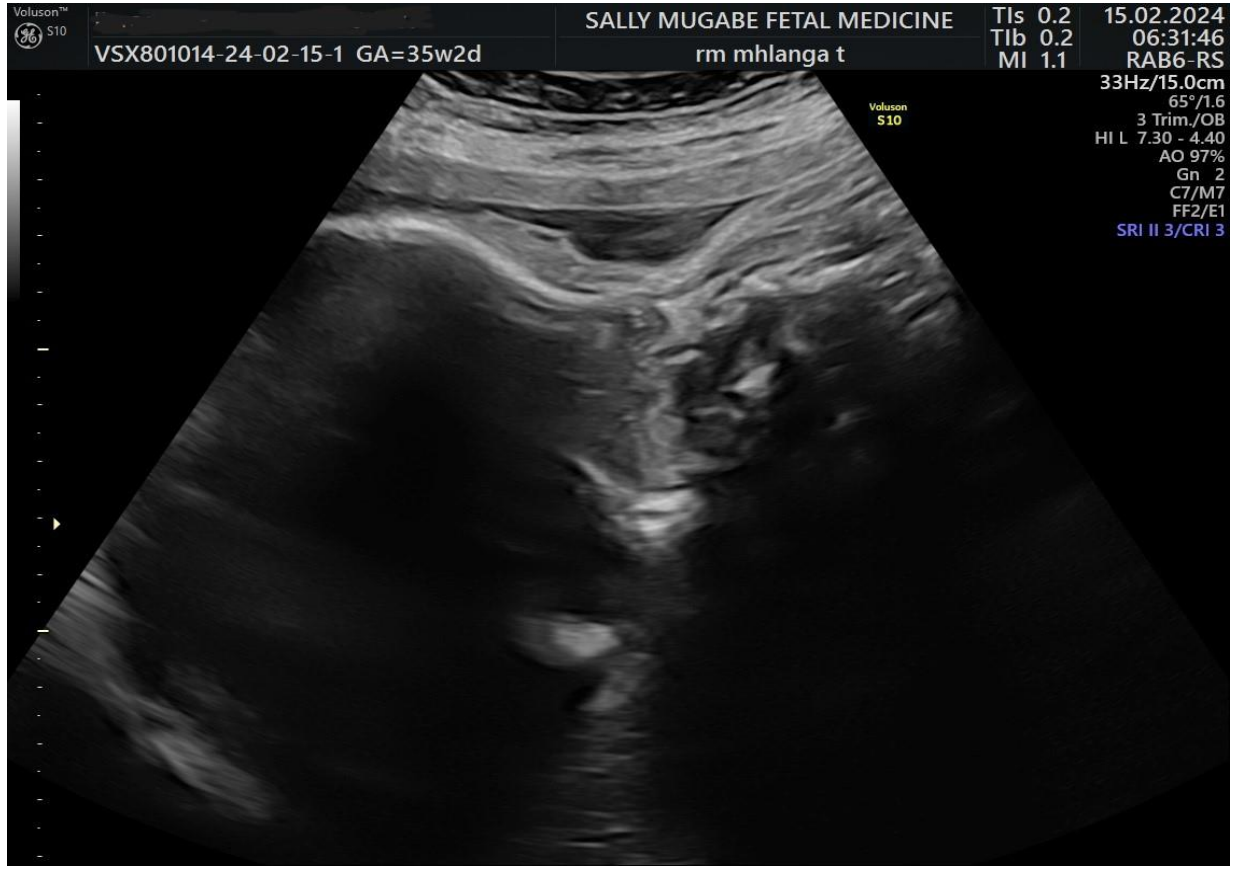
Ultrasound exam

Cervical region

Crowding of posterior fossa

Arnold Chiari malformation



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Ventriculomegaly and posterior fossa

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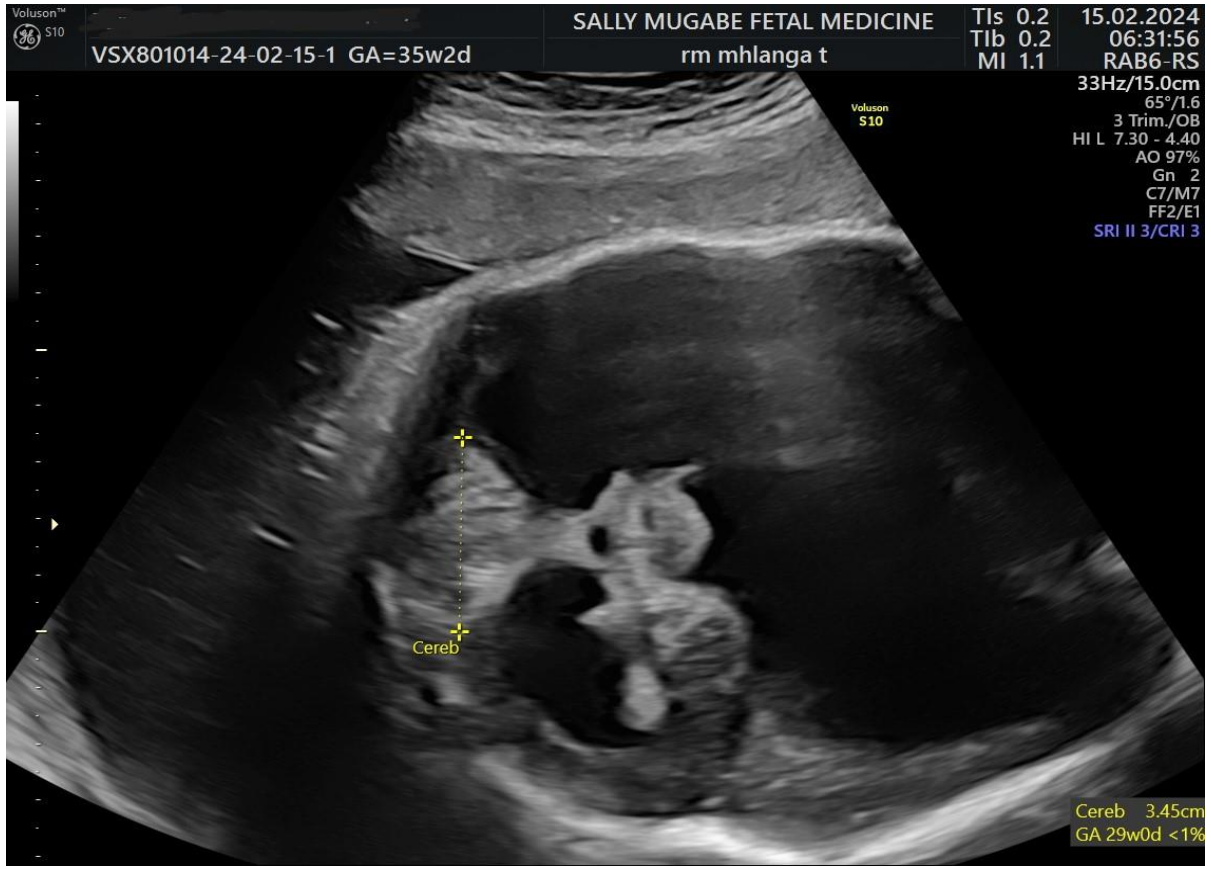

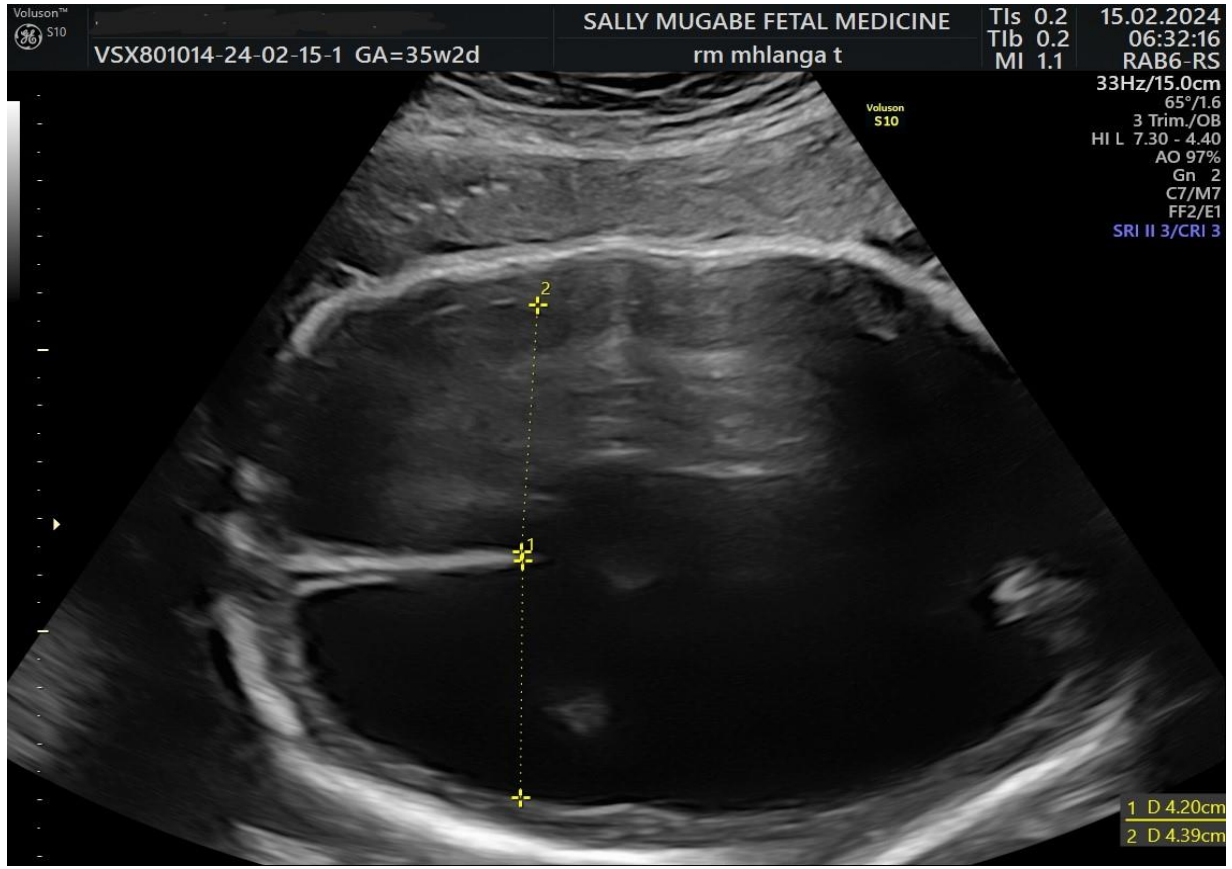

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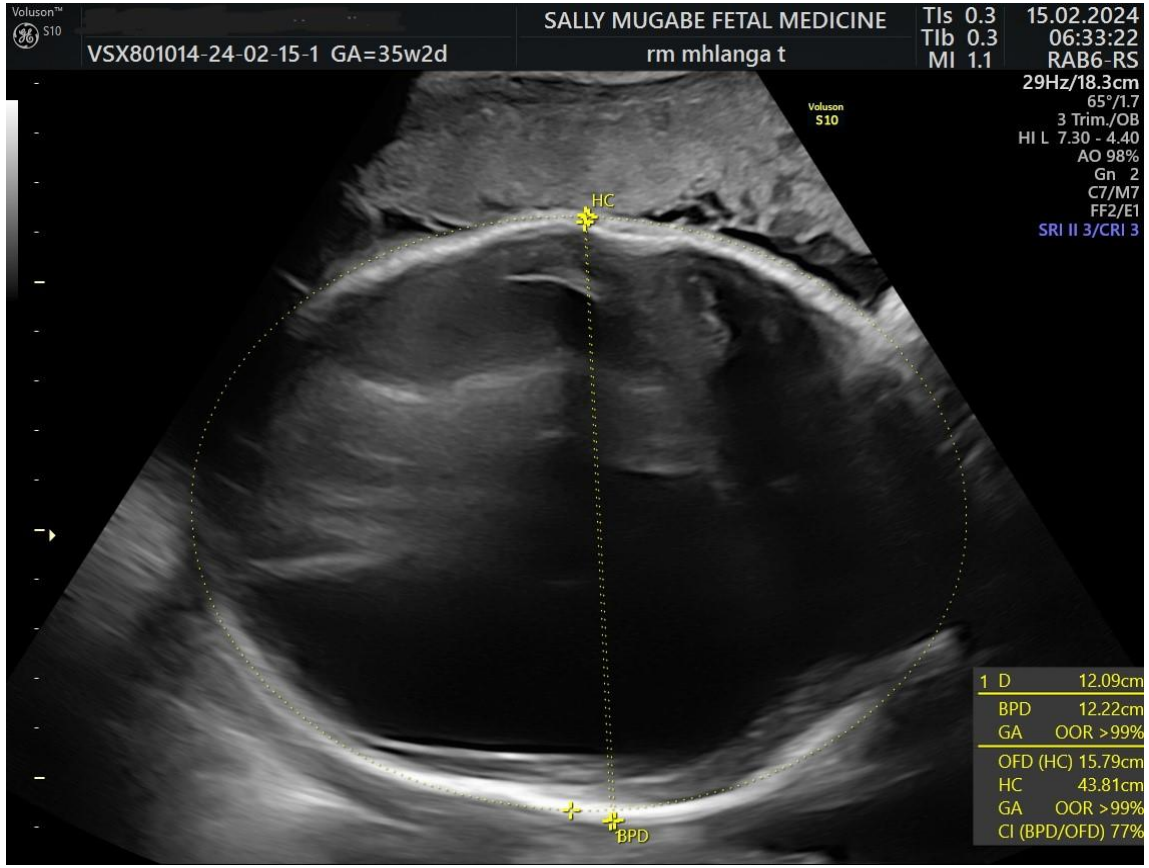
Lemon head and orbits



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Ultrasound-extremities

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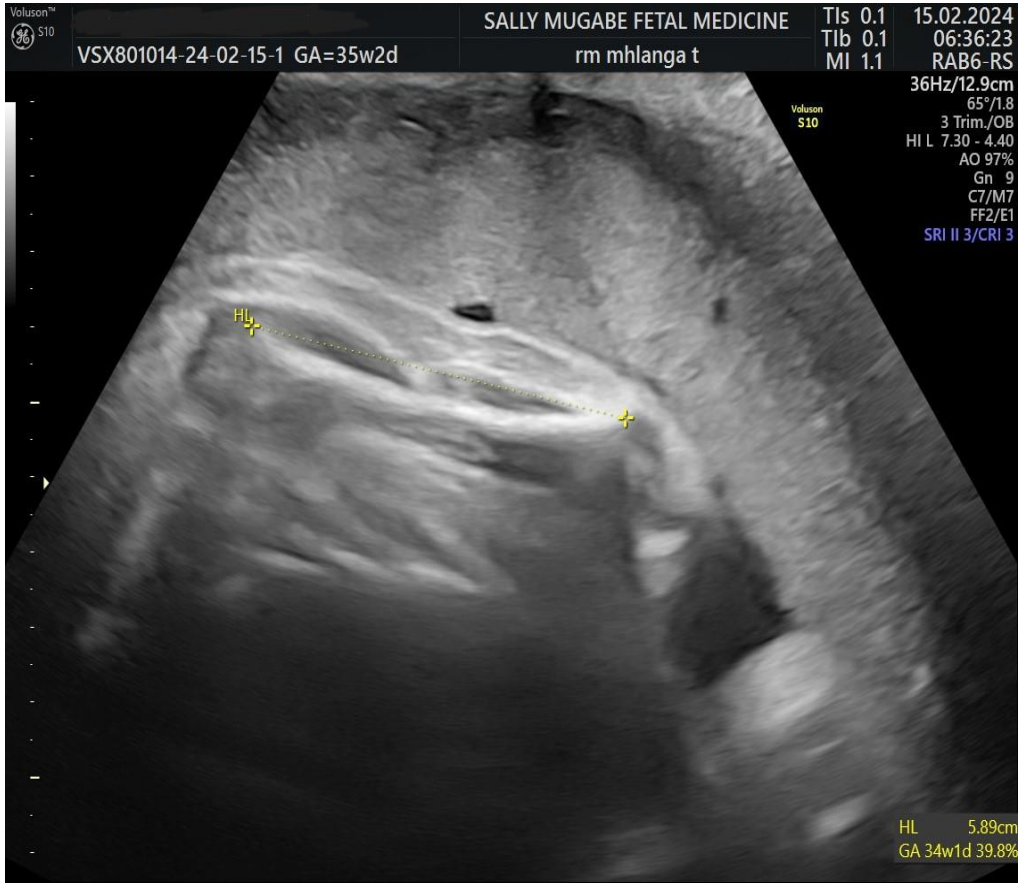

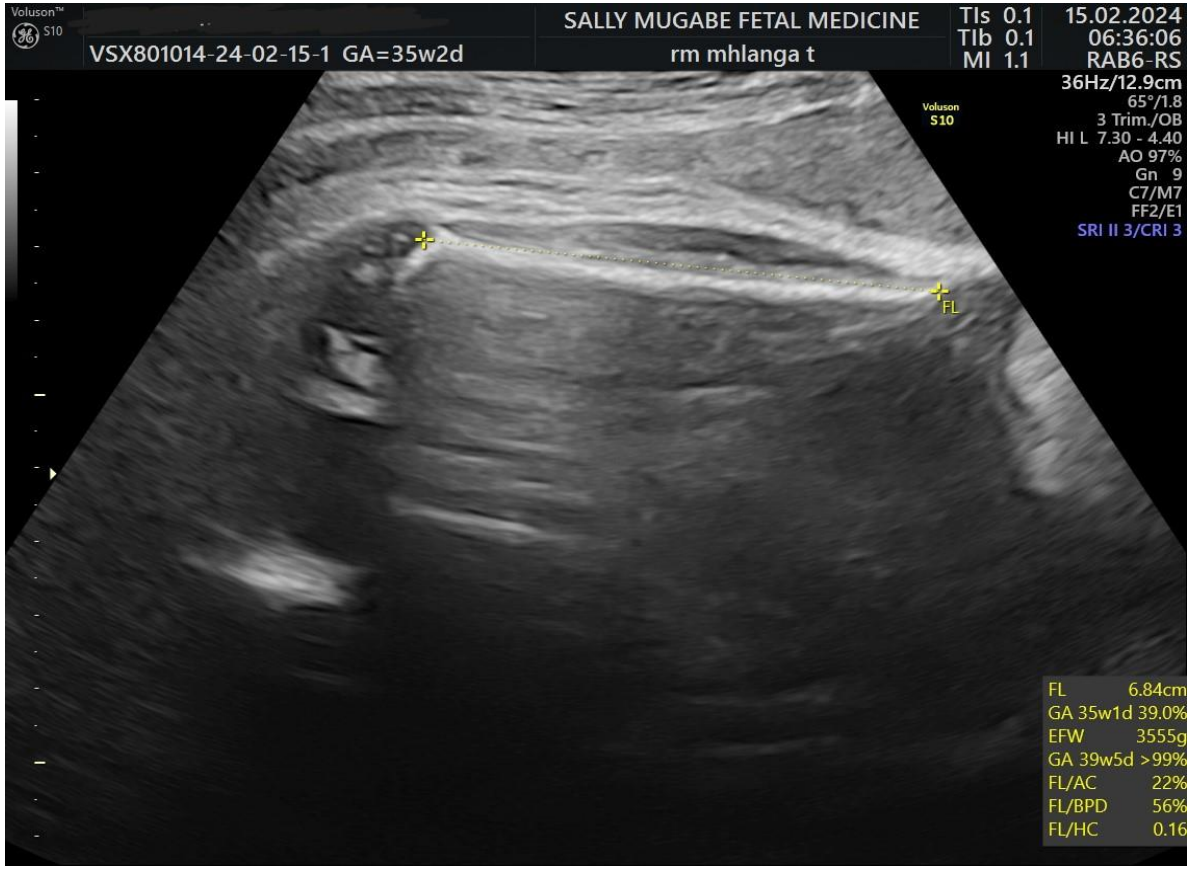

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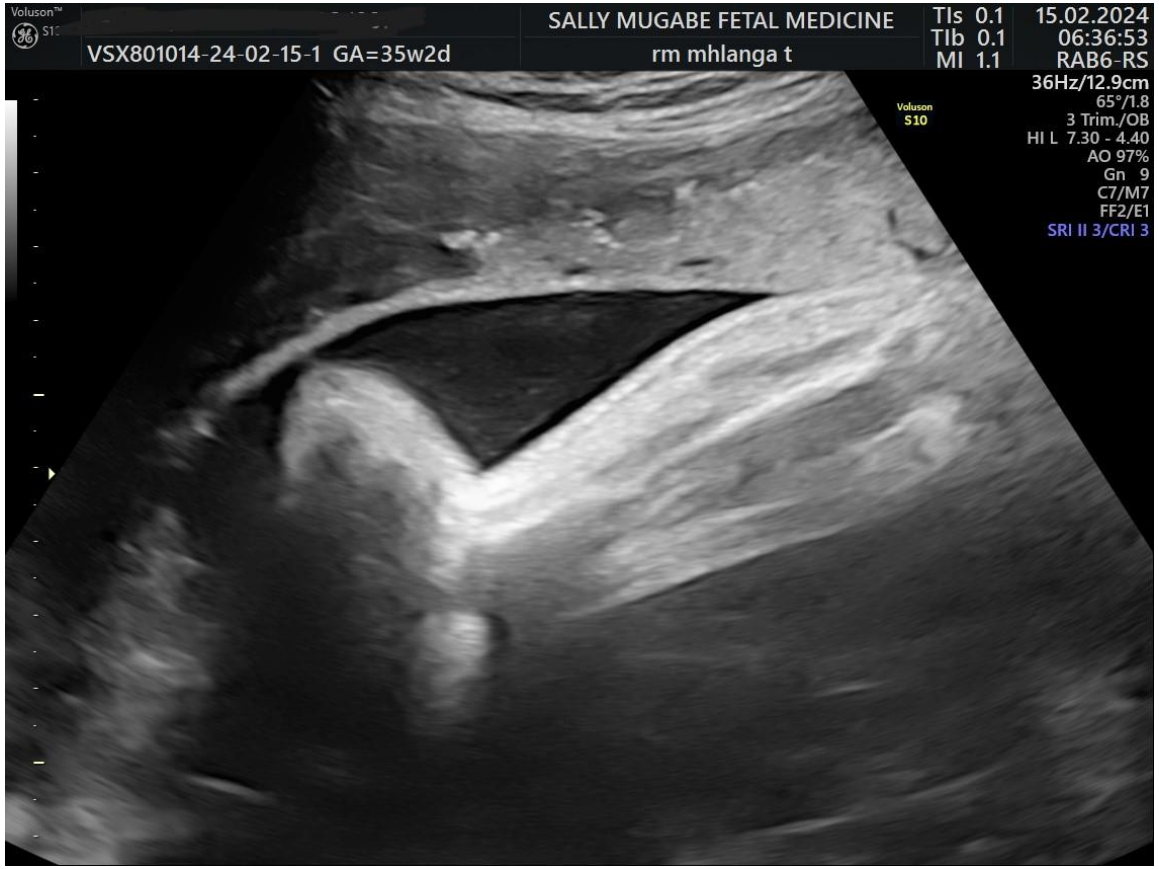
Extremities



Summary

- 36 year old P2G3 referred in third trimester with fetus with sacrococcygeal myelomeningocele and secondary severe ventriculomegaly.

Discussion-Risk factors

- Genetics
- Folic acid deficiency
  - supplementation reduces risk by 62% *(Wakoya, 2023)*
  - folic acid antagonists increase risk *(Hernández-Díaz S, 2000)*
  - concentrations low in mothers carrying fetus with NTD *(van der Put, 2001)*
- Age >35 [OR 3.54 (95% CI 1.67-7.47)] *(Wakoya, 2023)*
- Poorly controlled diabetes mellitus *(Guerin, 2007)*
- BMI >30kg/m2 increase risk by twofold *(Racusin, 2012)*

Prenatal diagnosis

Ultrasound

- TVS

- Detect >90% anencephaly, 80% encephalocele but low for spina bifida (44-54%) *(Maruotti, 2016)*

- TAS @ 18-20 weeks

- detect 92-95% of spina bifida, 100% anencephaly *(Cameron, 2009)*

MAFP

- @ 16-18 weeks ≥2.0 or 2.5 MoM

- Sensitivity 75.1%, specificity 97.7%, FPR 2.2% *(Wang, 2009)*

- Results influenced by age, weight and type 1 DM

- Also raised in abdominal wall defects, multiple pregnancies

Condition and complications

- Counselling on

1. Condition
2. Complications of condition
3. Fetal interventions
4. Postnatal care
5. Prognosis

- Almost all patients with myelomeningocele have Chiari II malformation, most have hydrocephalus
  - major cognitive deficits
  - brainstem dysfunction
- Severe neurologic deficits- complete paralysis, absence of sensation
  - bladder and bowel affected in 97% of patients
- Hydrocephalus lower among sacral lesions
- Long-term complications –learning difficulties, seizures, orthopedic problems, pressure ulcers

Fetal interventions

- Termination or fetal demise occur in 60-70% of pregnancies with NTDs *(Johnson, 2012)*

<u>Fetal surgery inclusion criteria</u>

- Open spina bifida with upper boundary between T1 and S1
- Hindbrain herniation
- Gestational age 19+0 to 25+6 weeks of gestation at time of procedure
- Maternal characteristics – age ≥18 years

- understands requirements and able to consent

- counselled on other options

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Outcomes of fetal surgery

Results in:

-Decreased need for shunting (RR 0.53, 95% CI 0.41-0.67)

-Improved motor development and function

-Similar cognitive outcomes

-Possible improvement in bladder function (RR 0.74, 95% CI 0.48-1.12)

-Modest improvement in QoL and impact on family

The Management of Myelomeningocele Study: full cohort 30-month pediatric outcomes

Diana L Farmer [1], Elizabeth A Thom [1], John W Brock III [1], Pamela K Burrows [1], Mark P Johnson [1], Lori J Howell [1], Jody A Farrell [1], Nalin Gupta [1], N Scott Adzick [1]; Management of Myelomeningocele Study Investigators[1]

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Advanced User Guide

Randomized Controlled Trial

Prenatal Repair and Physical Functioning Among Children With Myelomeningocele: A Secondary Analysis of a Randomized Clinical Trial

Amy J Houtrow et al. JAMA Pediatr. 2021.

Fetal surgery risks

- Preterm birth -46% in MOMS trial vs 5%
- Chorioamnionitis
- Chorion separation
- Spontaneous membrane rupture
- Oligohydramnios
- Placental abruption
- Maternal bleeding
- Need for caesarean section

Factors affecting outcome

- Level of myelomeningocele
  - thoracic and high lumbar have higher mortality and greater disability
- Severity of Chiari II malformation
  - degree of hindbrain herniation
- Presence or absence of hydrocephalus
- Motor deficits
  - assess for positional abnormalities at rest and with activity

Alternative management

- Serial ultrasound examination
- Nonstress tests and BPP from 34 weeks due to risk of stillbirth
- Delivery at center with level 3 or more neonatal
- Mode of delivery
- Postnatal surgery within 72 hours of delivery

- Fetocide
- Our patient
- Bad prognostic markers
  - Hydrocephalus
  - Advanced gestational age

Fetocide

- Injection of a pharmacologic agent into a fetus or amniotic fluid to cause fetal asystole
- Done for pregnancies beyond 21 weeks + 6 days *(RCOG)*
- First introduced in 1990s in abortion care
- Discussed with reference to uncertainty within the medical profession about the legal status of a live birth following TOP.

- To avoid resuscitation dilemma for pregnant woman, nurses and doctors.
- To avoid medicolegal and economic consequences of an unintended live birth that survives.
- To shorten the mean induction-abortion interval.
- To soften fetal tissues, may ease evacuation and decrease procedure time and minimize risk of complications.
- Respect the choice of the woman who prefer to know fetal heart stopped prior to evacuation.

Choice of agent

• Digoxin	• Potassium chloride	• Lignocaine
• 1mg • Intra-amniotic/ intracardiac/ intra-umbilical • Not immediately effective • Done 1-2 days prior to abortion	• Intracardiac/intraumbilical • Immediately effective	• 10-20ml of 2% • Primary or secondary agent • intracardiac./intraumbilical/intra-amniotic/intra-thoracic • Effective within 2 mins • Can repeat dose 20-40 mins later

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Concerns

Role of professional discretion.

Issue of professional vulnerability.

Legal uncertainty and variation in professional practice.

Life and death at the edge of viability in pregnancy/ neonatal care.

Little existing empirical work, lack of theoretically driven analysis.

Little knowledge about how participation is conceptualized or experienced by those closely involved – parents and health

- Substantial body of literature on technical/clinical aspects of feticide as a procedure
- Broader issue of fetal killing as a social trend
- Available literature as a medical procedure suggest more informed understanding of its context but falls short of a systematic analysis of that context.
- Literature centered around TOP for fetal abnormality.

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Our patient

- After counselling chose fetocide
- Intracardiac KCL achieved asystole in 3 mins
- Drainage of ventricles done –reduced HC to below 40mm
- IOL with oral misoprostol
- Postdelivery counselling

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Thank you

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