Postoperative Prenatal Outcome at CHOP

Fetal Myelomeningocele Repair: The Post-MOMS Experience at the Children's Hospital of Philadelphia

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Fetal Diagnosis and Therapy

How do we compare to MOMS?

Patient Characteristics	CHOP (n= 100)	MOMS Trial (n=78)
Maternal age, years	29.7 (18–41)	29.3 +/- 5.3
Gestational age at surgery	23.3 (20 2/7–25 6/7)	23.6 +/- 1.4
Body mass index (BMI)	26.3 (18.7–35)	26.2 +/- 3.7

Table 4. Operative characteristics (100 patients)

Gestational age at fetal surgery, weeks	23.3 (20 2/7–25 6/7)
Intraoperative cephalic version	
Yes	40 (40%)
No	60 (60%)
Maternal transfusion, U	1 (1%)
Estimated blood loss, ml	131.8 (50–500)
Patch required	
Yes	20 (20%)
No	80 (80%)
Fetal resuscitation	
Yes	5 (5%)
No	95 (95%)
Total operative time, min	78.5 (54–106)
Pulmonary edema	2 (2%)
Postoperative length of stay, days	4.2 (3–8)

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Postoperative Management Protocol after OFS for MMC at CHOP

Post-operative Management Protocol:

-DOS: tocolysis: MgSO4 and indomethacin (50mg q 6hrs)

pain management: epidural anesthesia

monitoring: continuous toco for contractions, q shift FHTs

diet: strict NPO

IVF: total fluids restricted to 85 cc/hr

antibiotics: Ancef 1gm x 4 or clindamycin 900mg x 3

drains: foley catheter

Key Points:

- fluid restriction
- pulse oximeter for O2 saturation
- urine output
- signs of magnesium toxicity

Postoperative Management Protocol after OFS for MMC at CHOP

- POD1: tocolysis: indomethacin (25mg q 6hrs) nifedipine (10–20mg q 6hrs)

  pain management: epidural anesthesia

  monitoring: continuous toco for contractions, q shift FHTs

  bedside ultrasound and fetal echo

  diet: NPO, start ice chips late afternoon

  IVF: total fluids restricted to 100 cc/hr

  drains: foley catheter

  Key Points:

  - MgSO4 discontinued, antibiotics completed
  - start nifedipine no sooner than 60-90 minutes after Mg stopped
  - pulse oximeter for O2 saturation
  - indomethacin decreased to 25mg

Postoperative Management Protocol after OFS for MMC at CHOP

- POD2: tocolysis: nifedipine (10 - 20mg q 4 - 6hrs)

  pain management: oral analgesics

  monitoring: toco prn for contractions, q shift FHTs

  bedside ultrasound and fetal echo

  diet: clear liquids, advance as tolerated

  IVF: heplock if tolerating clear liquids

  drains: discontinued, bathroom with assistance

  Key Points:

  - begin mobilization
  - carefully for dizziness/palpitations with nifedipine
  - start colase

Postoperative Management Protocol after OFS for MMC at CHOP

- POD3: tocolysis: nifedipine (10 - 20mg q 4 - 6 hrs)

  pain management: oral analgesics

  monitoring: toco prn for contractions, q shift FHTs

  bedside ultrasound

  diet: regular diet

  IVF: heplock IV access

  drains: none, bathroom with/without assistance

  Key Points:

  - increasing mobilization, shower with chair
  - carefully for dizziness/palpitations with nifedipine
  - coordinate housing plans/wheelchair for discharge

Postoperative Management Protocol after OFS for MMC at CHOP

- POD4: tocolysis: nifedipine (10 - 20mg q 4 - 6 hrs)

  pain management: oral analgesics

  monitoring: bedside ultrasound before discharge

  diet: regular diet

  activity: activity restrictions with bathroom privileges (2 wks)

  wheelchair use after 2 weeks

  Discharge:

  - schedule weekly ultrasound evaluations and prenatal visits
  - meds: nifedipine, prenatal vitamin, +/- colase
  - review of signs/symptoms of post-op complications (printed)
  - SDU card (SDU patient ID and emergency contact information)

Antepartum Complications

Oligohydramnios (20.9% MOMS)

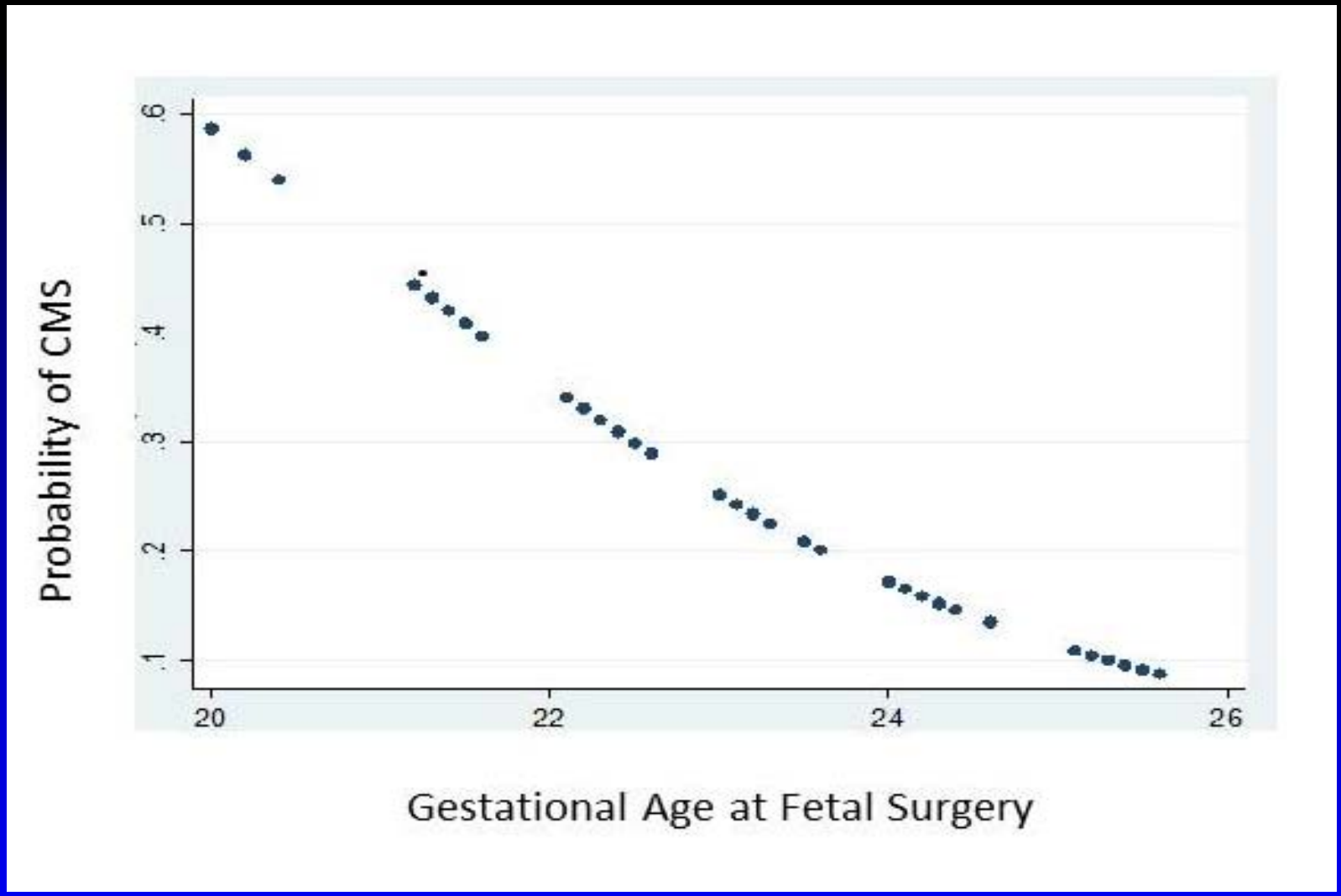
- if within first 2 weeks generally resolves
- rule out vaginal leaking (PROM)
- consider hysterotomy leak
- consider placental etiology
- inpatient management, delivery if $\geq$ 34 weeks

Antepartum Complications

- *Membrane separation* (25.3% in MOMS)

  - localized: generally resolve
  - large (≥1/3): most progress with subsequent PROM
    - more stringent activity restrictions
  - global: high risk for PROM
    - admission with twice daily fetal testing
    - reported cases of IUFD if separation extends onto the umbilical cord (steroids)

Prediction of CMS by Gestational Age at Fetal Surgery



Antepartum Complications

premature rupture of membranes (PROM)

- MOMS: 44%*
- pre-MOMS: all were associated with CAS: 22%
- management: represents leak in membranes at hysterotomy site usually with several weeks latency to delivery
  - inpatient expectant management
  - betamethasone and PROM antibiotics
  - twice daily NST, weekly AF assessment
  - cesarean delivery at 34 wks

Antepartum Complications

complications of hysterotomy

- scar dehiscence or rupture:
- intact, well healed: 64.8%
- very thin: 23.9%
- partial dehiscence: 9.1%
- complete dehiscence: 2.3%
- omentum patch and other dense adhesions
- longer surgery times
- 8.8 % transfusion rate in MOMS

All noted at the time of delivery – not antepartum

Maternal and Perinatal Outcomes	CHOP	MOMS Trial
Membrane separation	22/96 (22.9%)	20/78 (25.6%)
Preterm premature rupture of membranes (PPROM)	31/96 (32.3%)	36/78 (46.2%)
Preterm labor (PTL)	36/96 (37.5%)	30/78 (38.5%)
Oligohydramnios	6/96 (6.3%)	16/78 (20.5%)
Gestational age at delivery		
Average	34.3 weeks	34.1 weeks +/-3.1
< 30 weeks	9/96 (9.4%)	10/78 (12.8%)
30–34 weeks	35/96 (36.5%)	26/78 (33.3%)
35–36 weeks	26/96 (27.1%)	26/78 (33.3%)
> 37 weeks	26/96 (27.1%)	16/78 (20.5%)
Birth weight	2415.5 grams (501– 3636)	2383 +/- 688
Perinatal death	6/98 (6.1%)	3.0%
Intrauterine fetal demise (IUFD)	2	NR
Neonatal demise (NND)**	4	NR