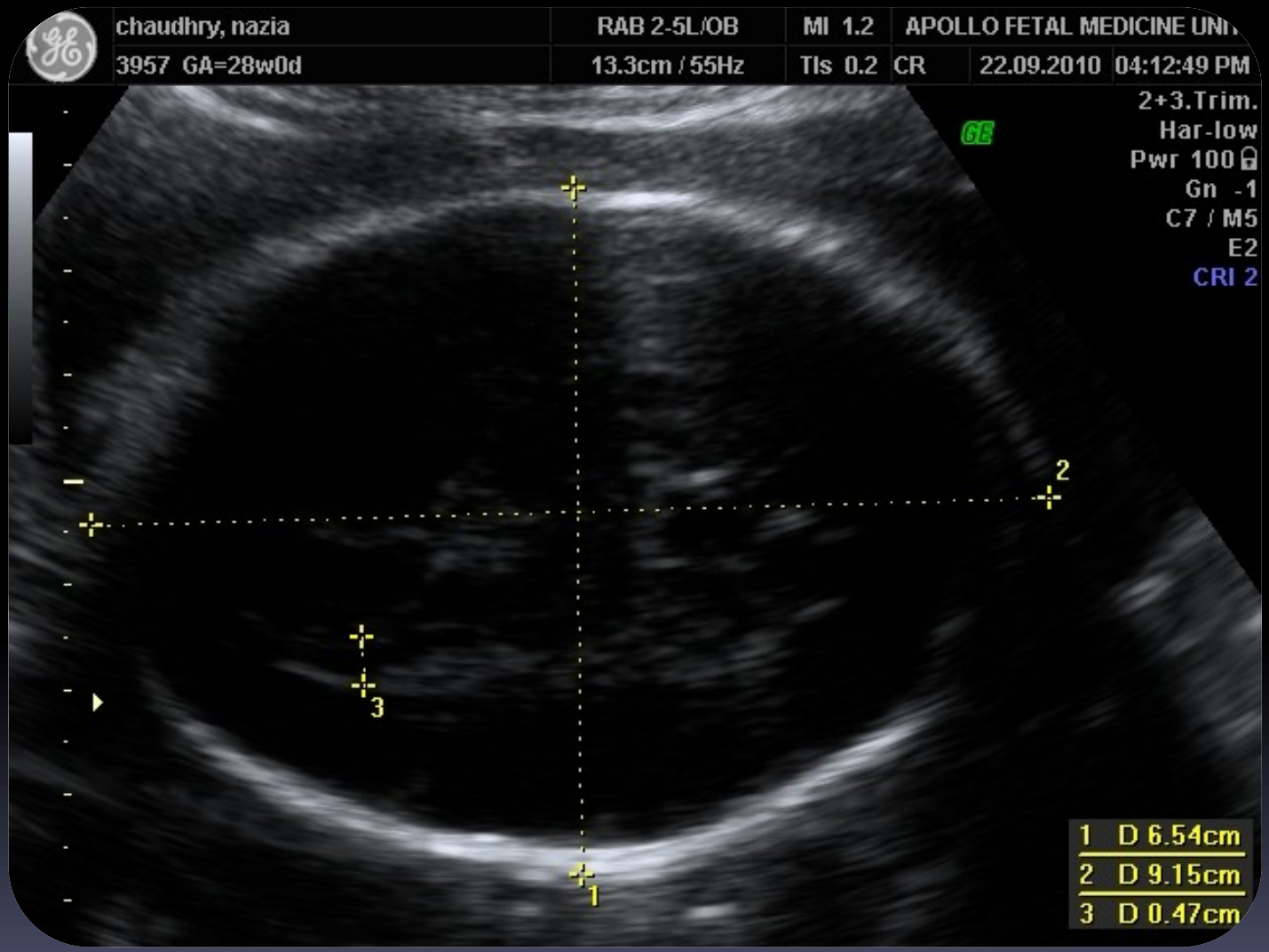
Antenatally diagnosed fetal meningomyelocele

- Mrs.NC
- 27 years
- G4P2A1L2
- Previous two term vaginal deliveries, uneventful pregnancies, LCB 3 years
- Presented at 28 weeks for a second opinion for a antenatally diagnosed spina bifida

- Normal biometry
- Normal AFI
- Lumbar meningocele
- Brain /Skull normal

- Advised MRI – spinal defect at L4/L5
- Neurosurgeon opinion taken

28 weeks



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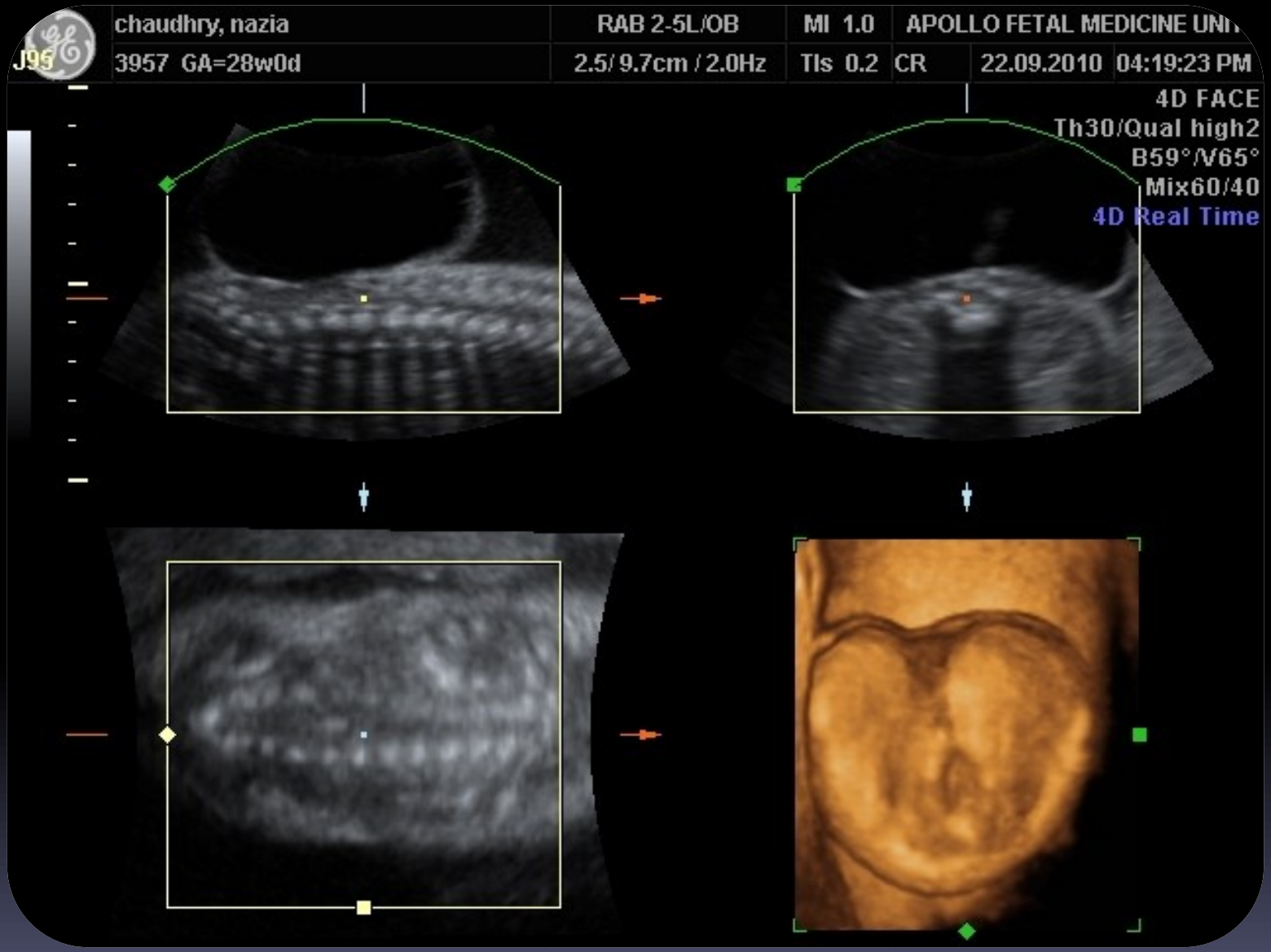

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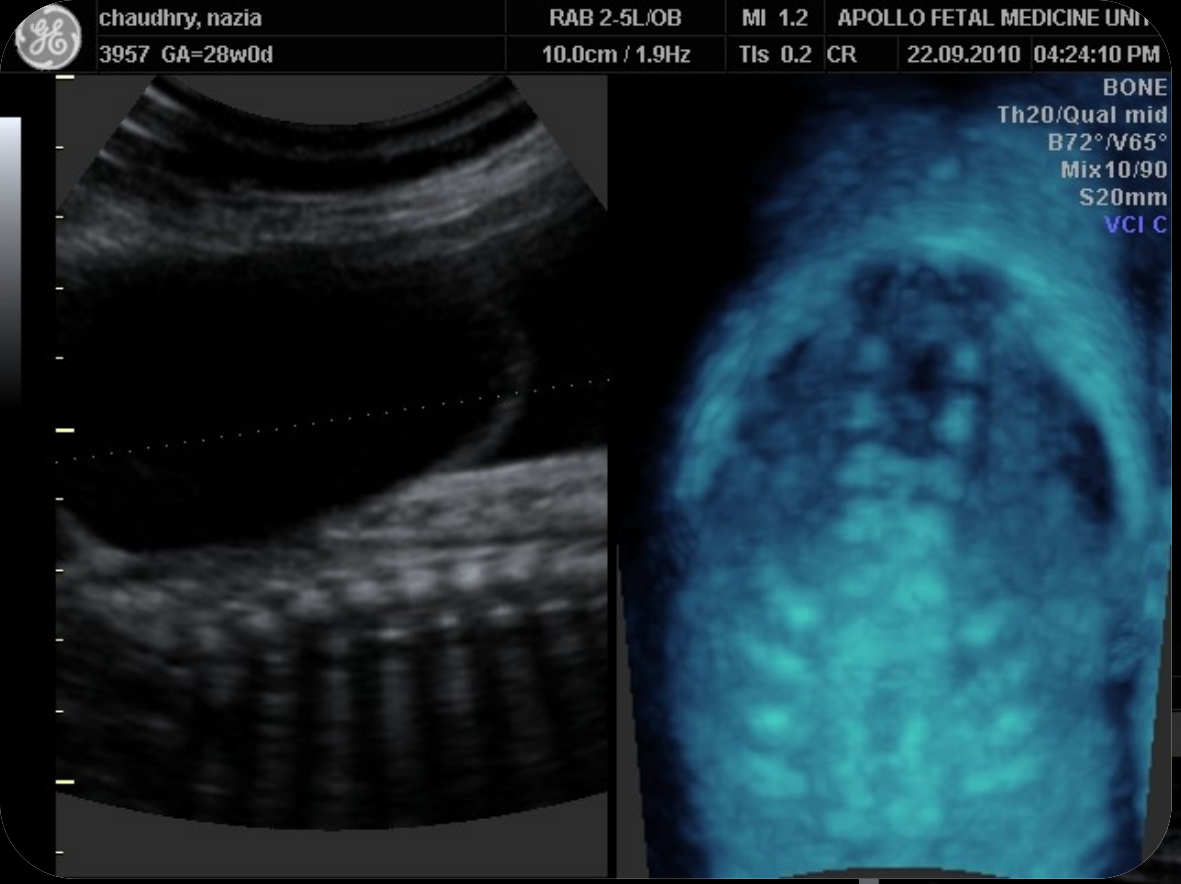

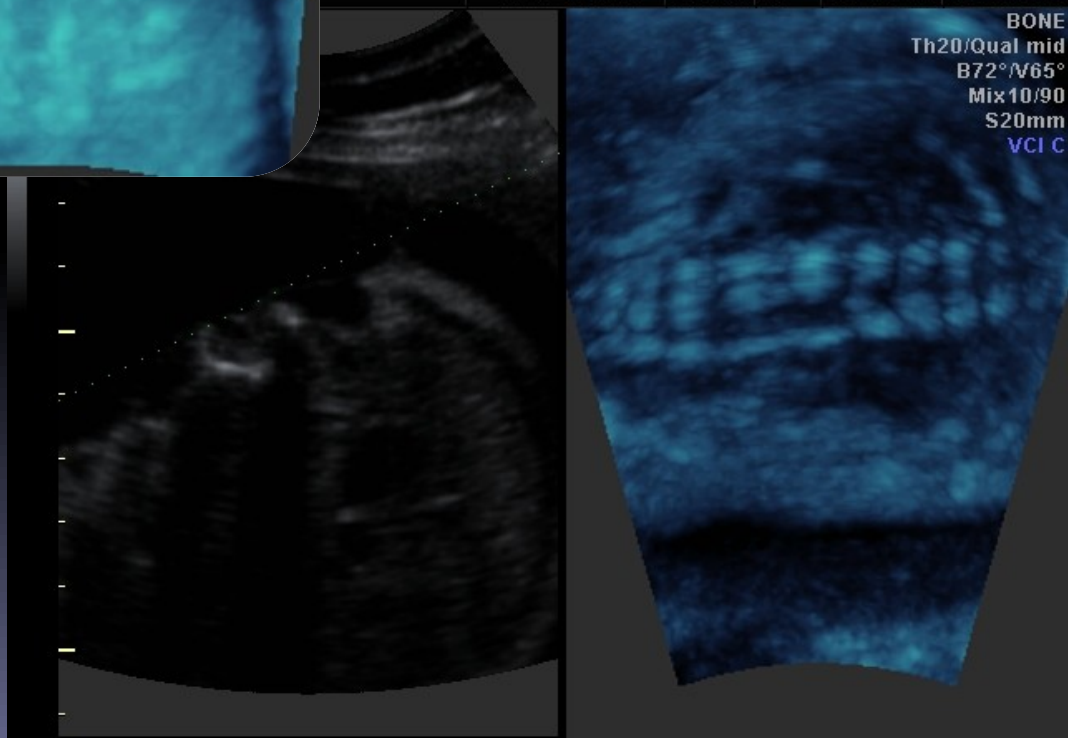

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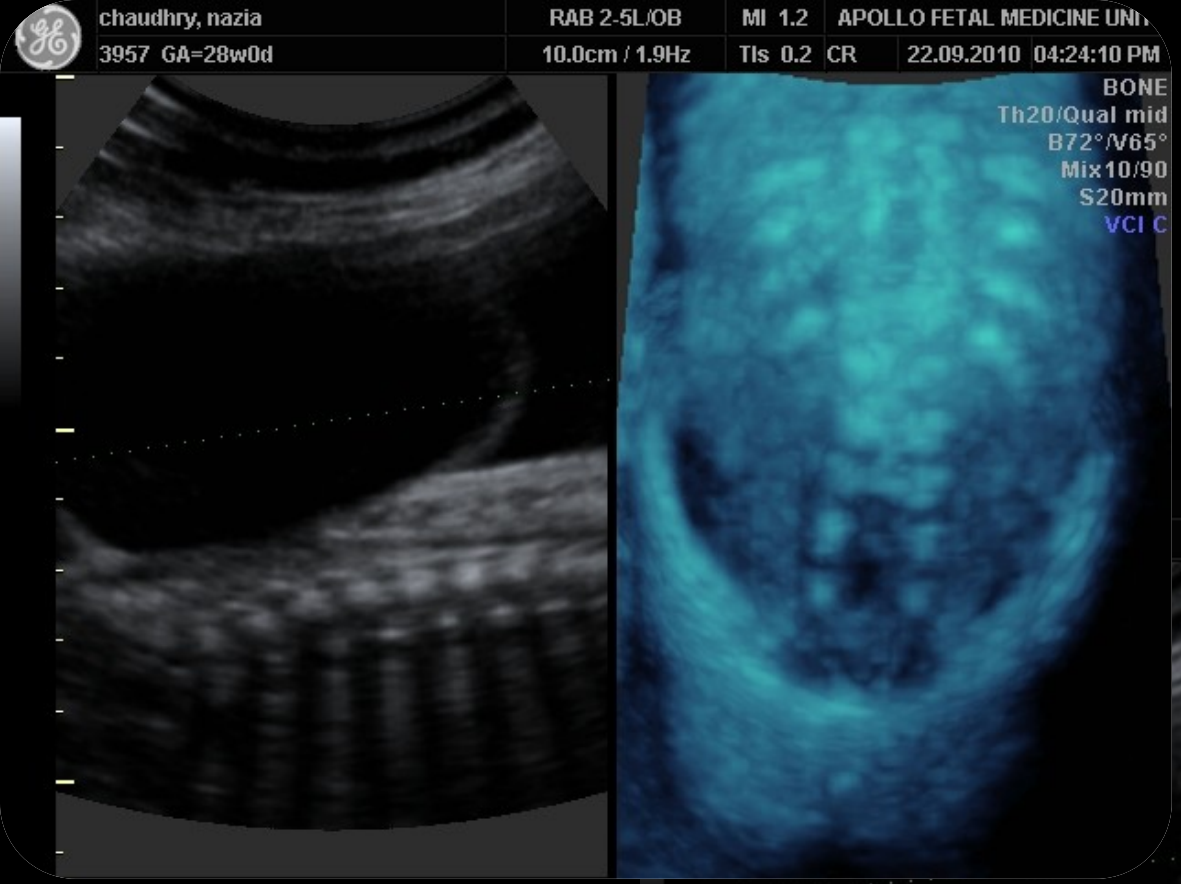

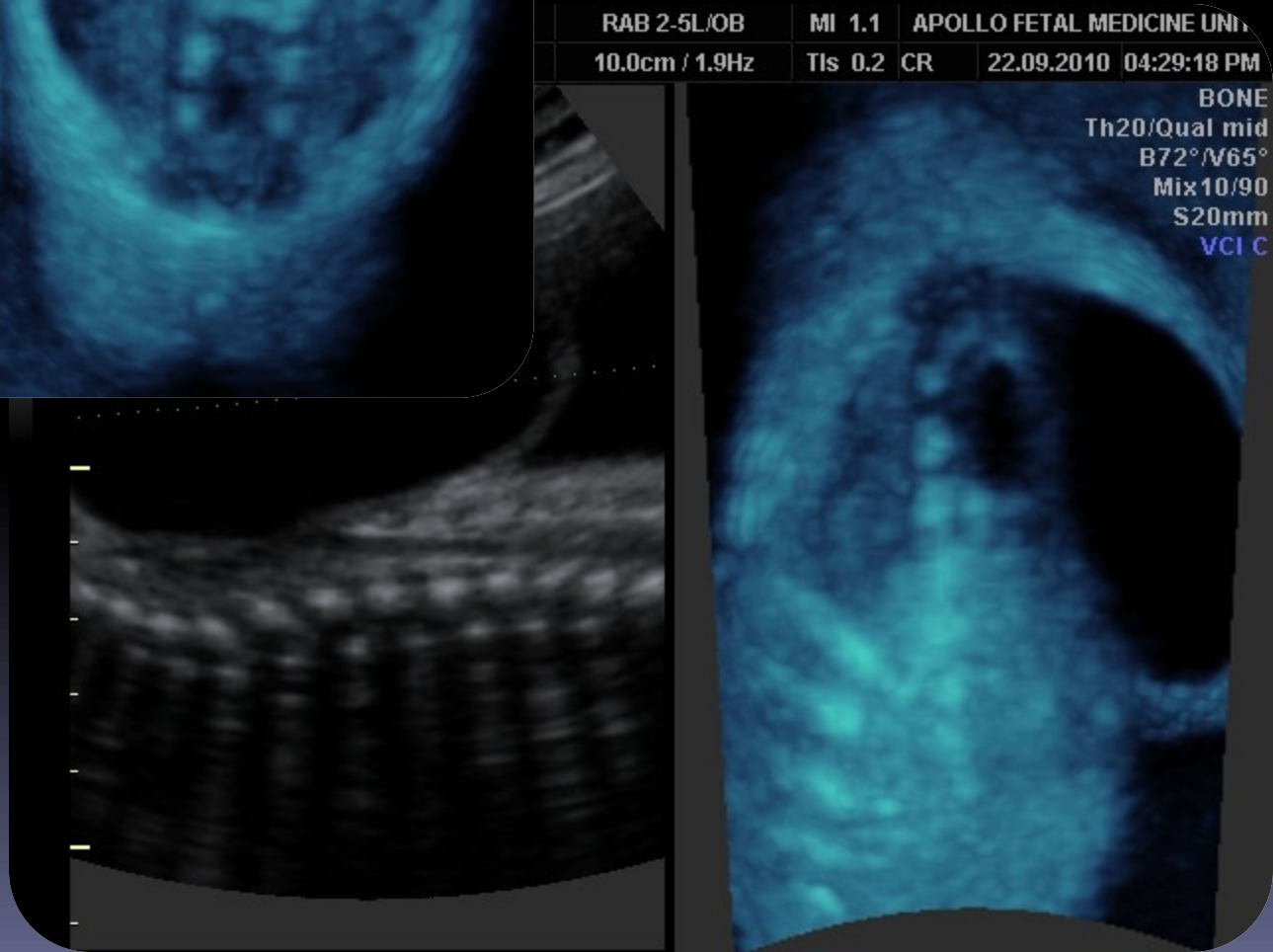

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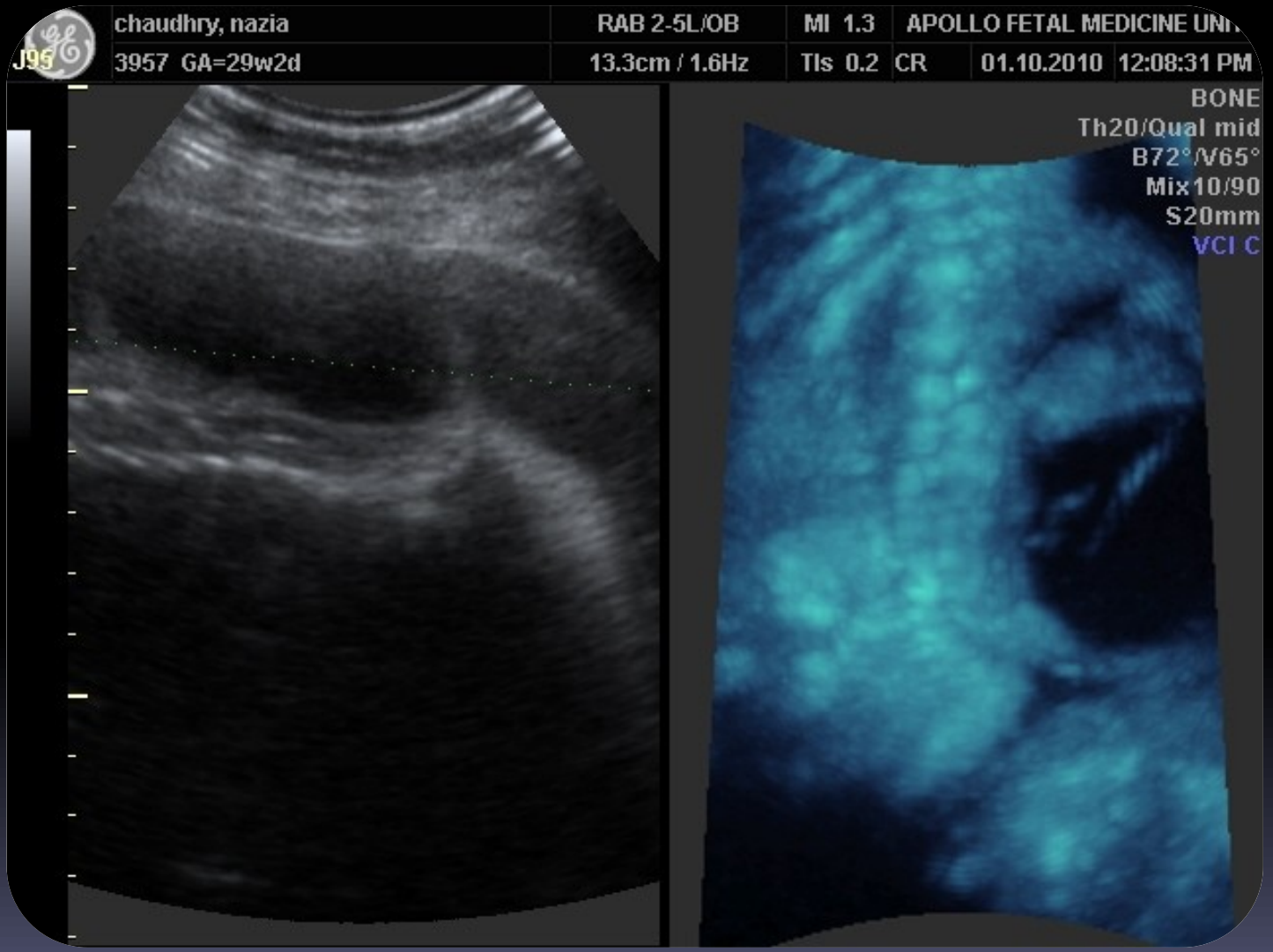
29 weeks 2 days



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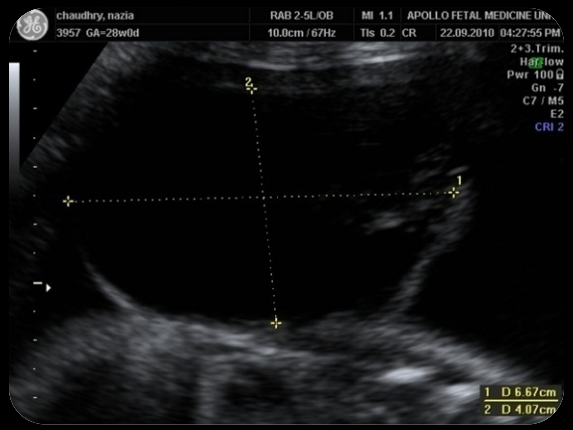
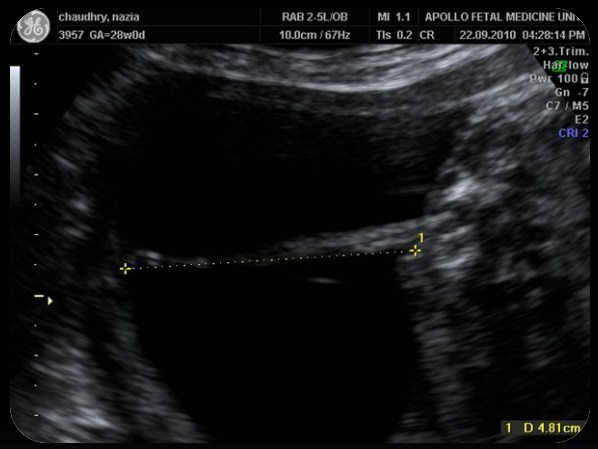
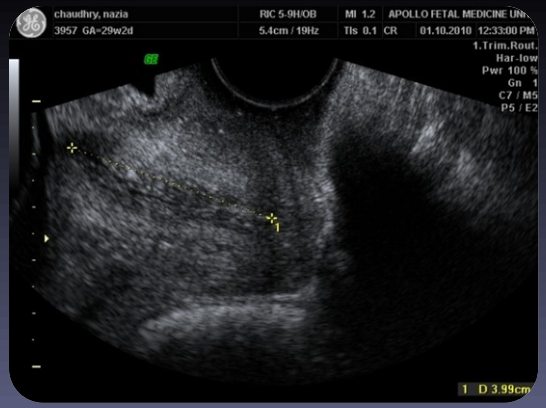
- Satisfactory fetal growth
- Normal amniotic fluid
- Normal cerebral ventricles
- Good lower limb movements
- Pregnancy continued with close surveillance with plan for post natal surgery







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Fetal Therapy

Medical

Surgical

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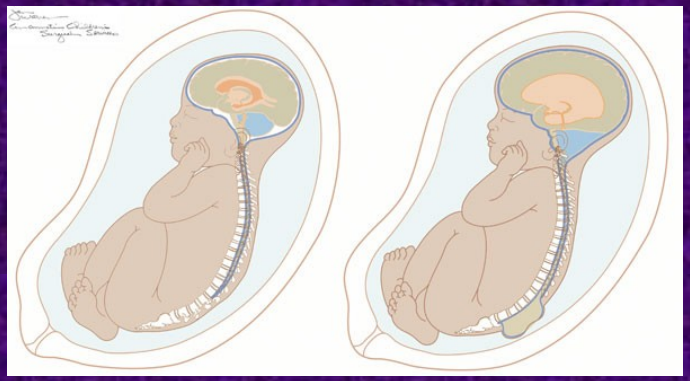

Fetal surgery for neural tube defects

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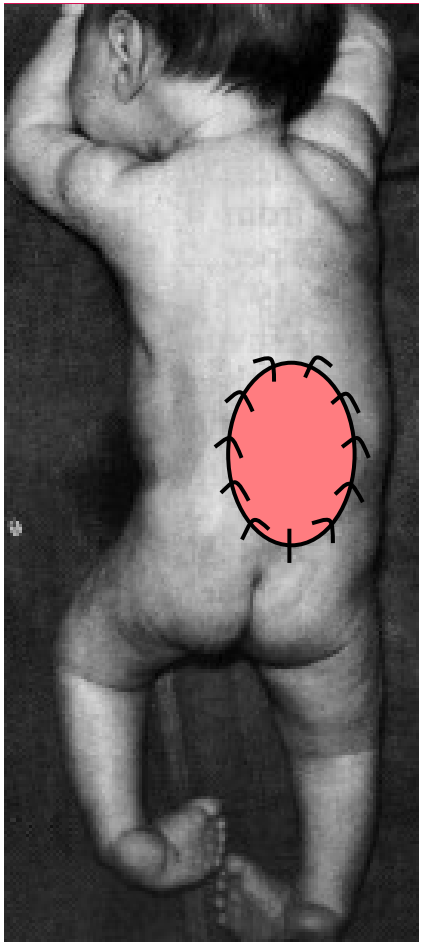
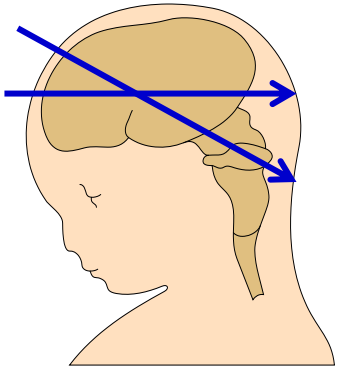
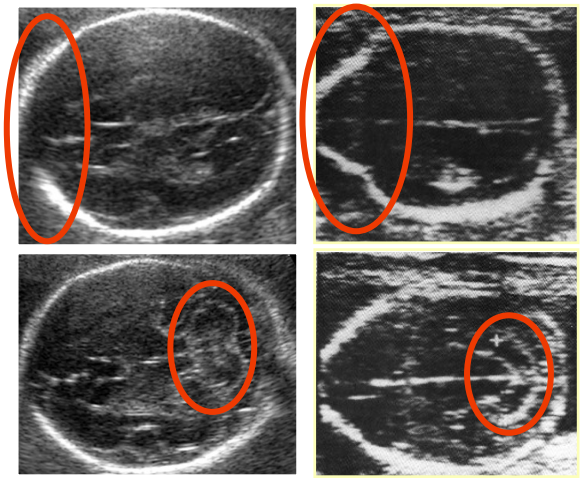
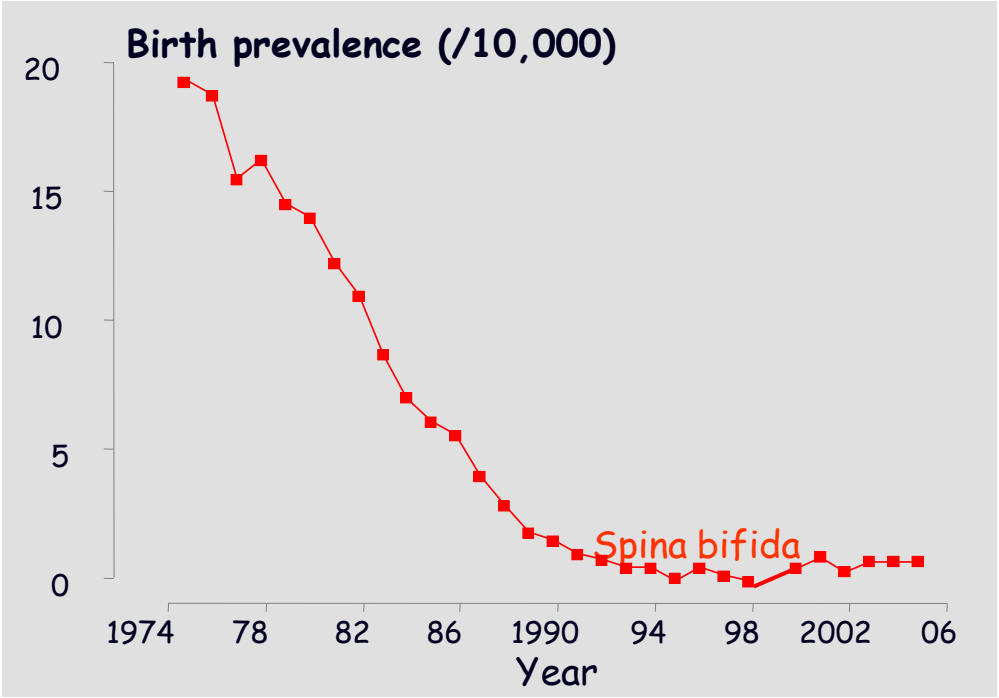
Fetal surgery to prevent paralysis in spina bifida









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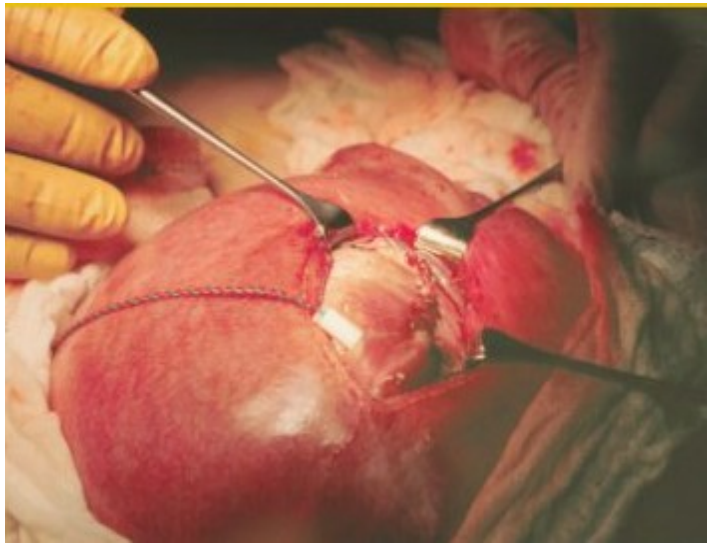
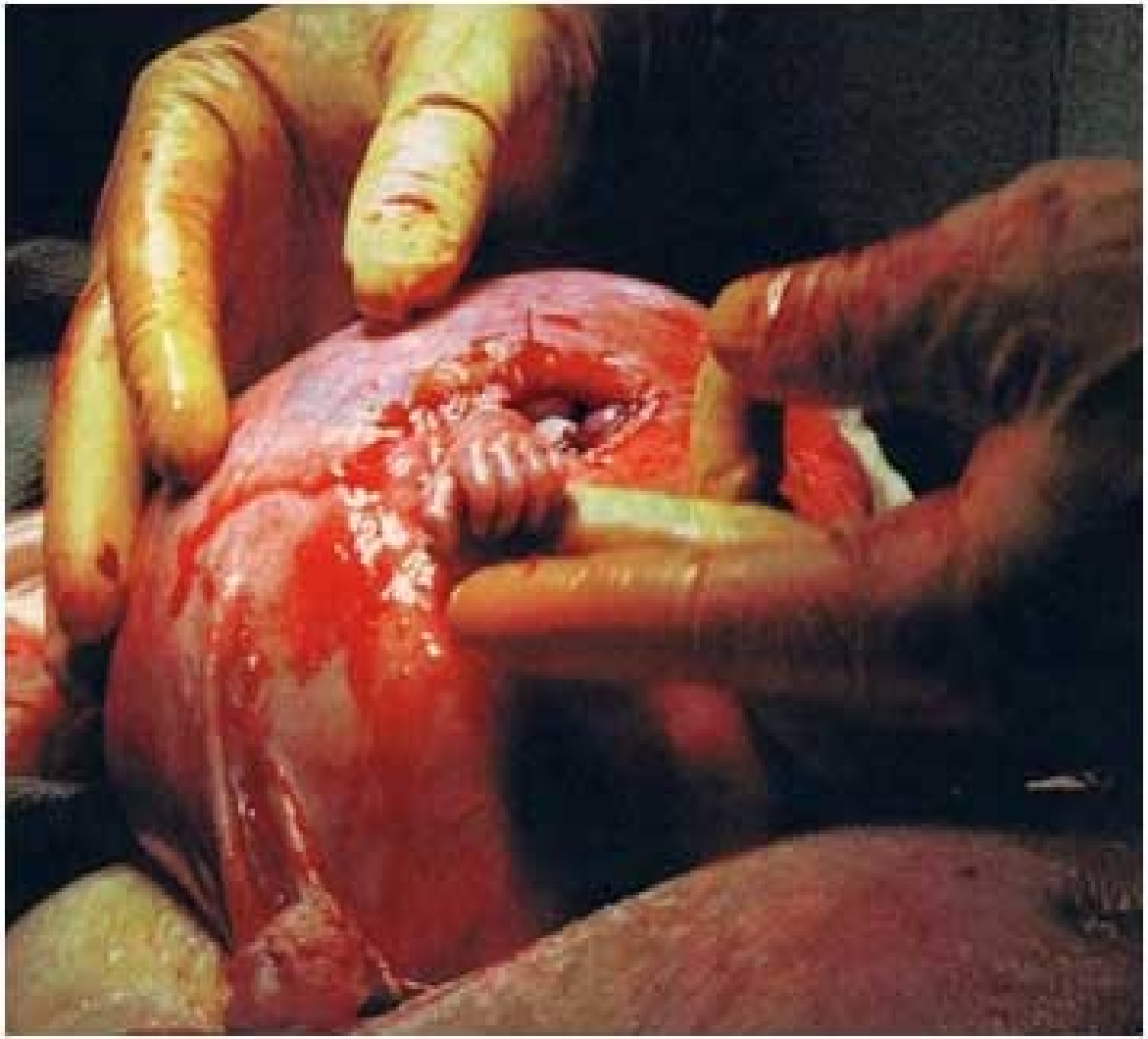
Fetal surgery by hysterotomy





Samuel Armas
21 weeks in the womb

Samuel Armas
3 years out of the womb

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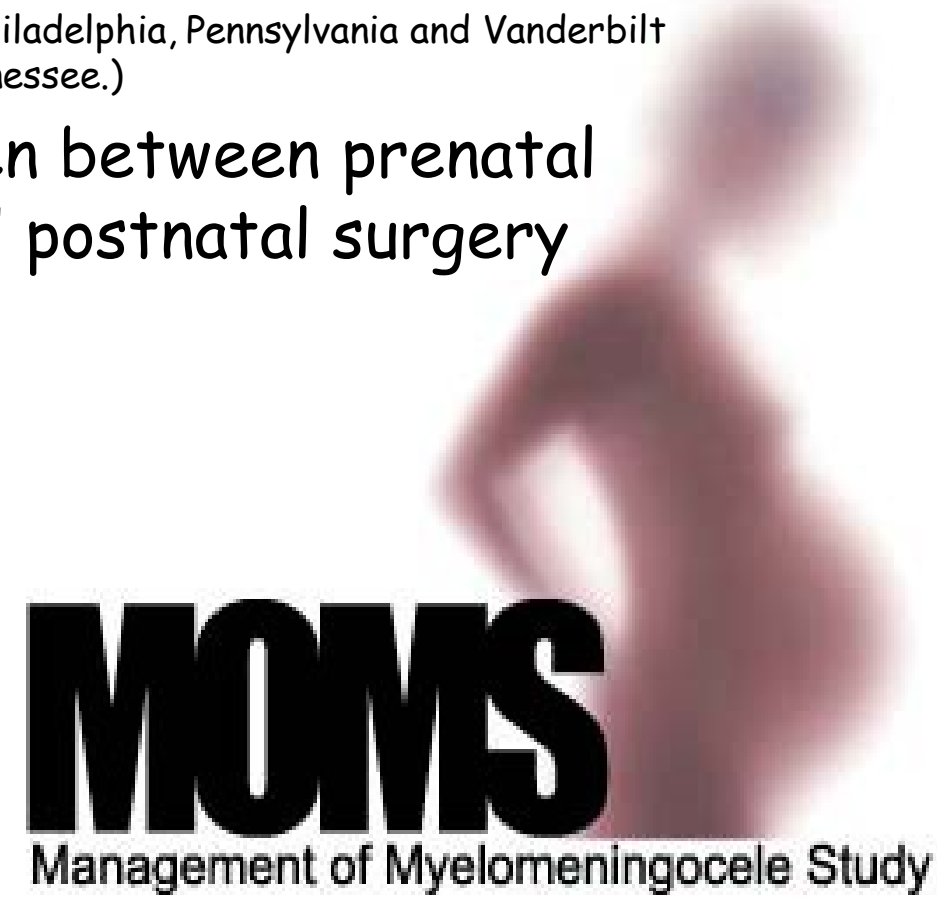
MOMS Study

NICHD sponsored study

3 centres US (University of California at San Francisco in San Francisco, California, The Children's Hospital of Philadelphia in Philadelphia, Pennsylvania and Vanderbilt University Medical Center in Nashville, Tennessee.)

Randomised trial 200 women between prenatal surgery 19-25 weeks and postnatal surgery

Recruited 180 women



Prenatal Surgery Group

- Individuals assigned to have surgery before birth will be scheduled for surgery within one to three days of their enrollment.
- The surgery must be done before the end of the 25th week of pregnancy because there is some information suggesting that the earlier in pregnancy it is done, the better the results may be.
- Because the surgery will be done so soon after the assignment is made, individuals will not be able to return home once the assignment to prenatal surgery is made.
- They should come to the MOMS Center prepared to stay until they deliver, around 37 weeks of pregnancy.

Postnatal Surgery Group

- Individuals assigned to the postnatal surgery group will return to their home community for care by their doctors.
- At 37 weeks, if the baby has not yet been born, the woman and her support person will return to their MOMS Center for delivery by C-section.
- Babies will have their spina bifida defects closed when they are medically stable, usually within 48 hours.
- Infants with spina bifida are usually in the hospital for one to two weeks after birth while they are stabilized, have their spina bifida defect closed and undergo a thorough medical evaluation.

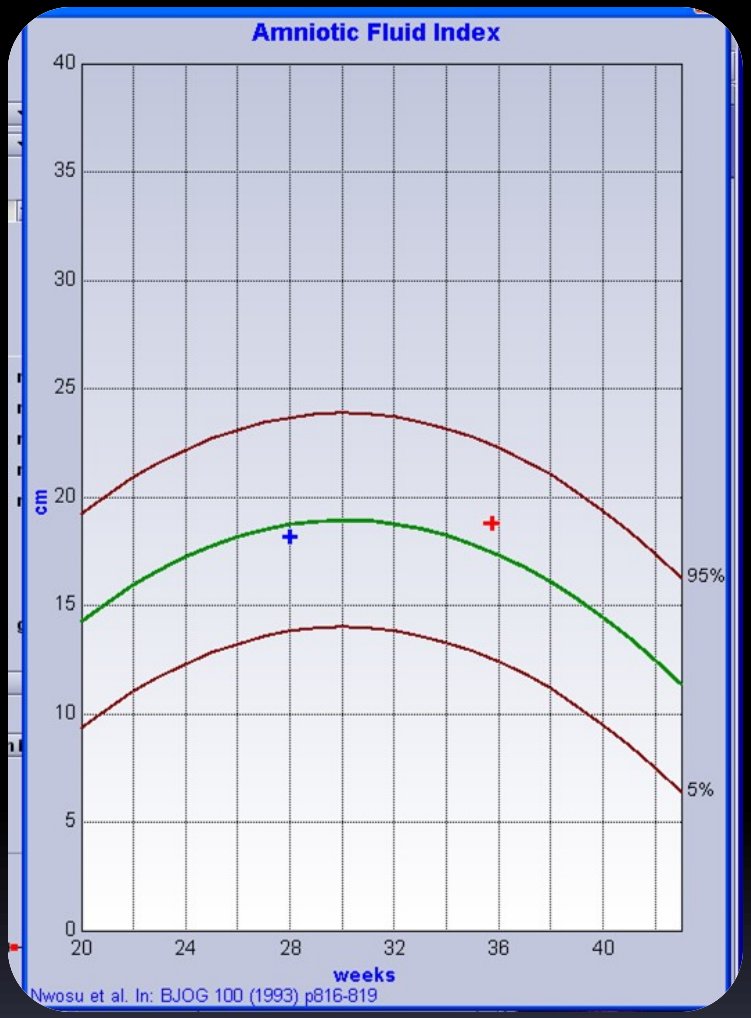
Risks of Prenatal Surgery - Mother

- Wound infection after the fetal surgery.
- Intrauterine (in the uterus) infection. If this occurs the baby will need to be delivered right away.
- Amniotic fluid leak. If it occurs, the mother will probably need to be admitted to the hospital to be treated with bed rest and IV (intravenous) fluids. She may need to stay in the hospital until delivery.
- Loss of ability to have more children.
- Significant bleeding during the fetal surgery.
- Side effects from any medications needed before, during, or after surgery. Side effects depend on the specific medications used.
- Complications from general anesthesia. This risk is no higher than for any other surgery requiring general anesthesia.
- Effect on future pregnancies and deliveries. It is recommended that mothers do not labor during future pregnancies and deliver by C-section instead.
- Psychological stress. There are risks of depression in both groups of women. There is the potential for placing a psychological burden on the family because of the demands of the study, including having to stay away from home and the need to travel to the MOMS Center several times.

Risks of Prenatal Surgery

- **Possible Risks to Fetus or Baby**

- Further damage to the spinal cord and nerves from the prenatal surgery.
- Prematurity. Fetal surgery can result in early delivery. The earlier the baby is born, the higher the chance that they will have problems associated with prematurity.
- Membrane separation. The fetal surgery may cause the tissues surrounding the baby and amniotic fluid to separate from the uterus causing early delivery or interference with the blood flow to some part of the baby such as an arm or leg.



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38 weeks

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CESAREAN SECTION BEFORE THE ONSET OF LABOR AND SUBSEQUENT MOTOR FUNCTION IN INFANTS WITH MENINGOMYELOCELE DIAGNOSED ANTENATALLY

DAVID A. LUTHY, M.D., TERRENCE WARDINSKY, M.D., DAVID B. SHURTLEFF, M.D., KATHRYN A. HOLLENBACH, PH.D., DURLIN E. HICKOK, M.D., M.P.H., DAVID A. NYBERG, M.D., AND THOMAS J. BENEDETTI, M.D.

Abstract *Background.* Meningomyelocele can now be detected before birth. Few data are available on its natural history, however, and optimal management at the time of delivery is controversial, although it has been suggested that labor and vaginal delivery may cause pressure on exposed nerve roots, resulting in additional loss of neural function.

Methods. To assess the effect of labor and the type of delivery on the level of motor function in fetuses with uncomplicated meningomyelocele, we identified 200 cases of this disorder, accounting for 95 percent of the cases that occurred in the state of Washington during our 10-year study period. We compared the outcomes of 47 infants delivered by cesarean section before labor began, 35 delivered by cesarean section after a period of labor, and 78 who were delivered vaginally (another 40 were ineligible for the study). In cases of meningomyelocele detected prenatally, cesarean section was performed before the onset of labor if isolated meningomyelocele without severe hydrocephalus was present. The infants delivered in this manner were compared with those who were delivered either vaginally or by cesarean section after labor began.

Results. At two years of age, the infants who had been exposed to labor were 2.2 times more likely to have severe paralysis than those delivered by cesarean section without labor (95 percent confidence interval, 1.7 to 2.8). Infants delivered by cesarean section before the beginning of labor had a mean (±SD) level of paralysis 3.3±3.0 segments below the anatomical level of the spinal lesion at two years of age, as compared with 1.1±2.3 for infants delivered vaginally and 0.9±4.1 for infants delivered by cesarean section after the beginning of labor ($P<0.001$ for both comparisons). Exposure to labor did not affect the frequency of neonatal complications or later intellectual performance.

Conclusions. For the fetus with uncomplicated meningomyelocele, delivery by cesarean section before the onset of labor may result in better subsequent motor function than vaginal delivery or delivery by cesarean section after a period of labor. (N Engl J Med 1991; 324: 662-6.)

Peripartum management :

- Planned delivery by elective LSCS at term
- Neurosurgeon with the Neurosurgical OT stand-by for any emergency intervention as needed
- Senior neonatologist to attend delivery

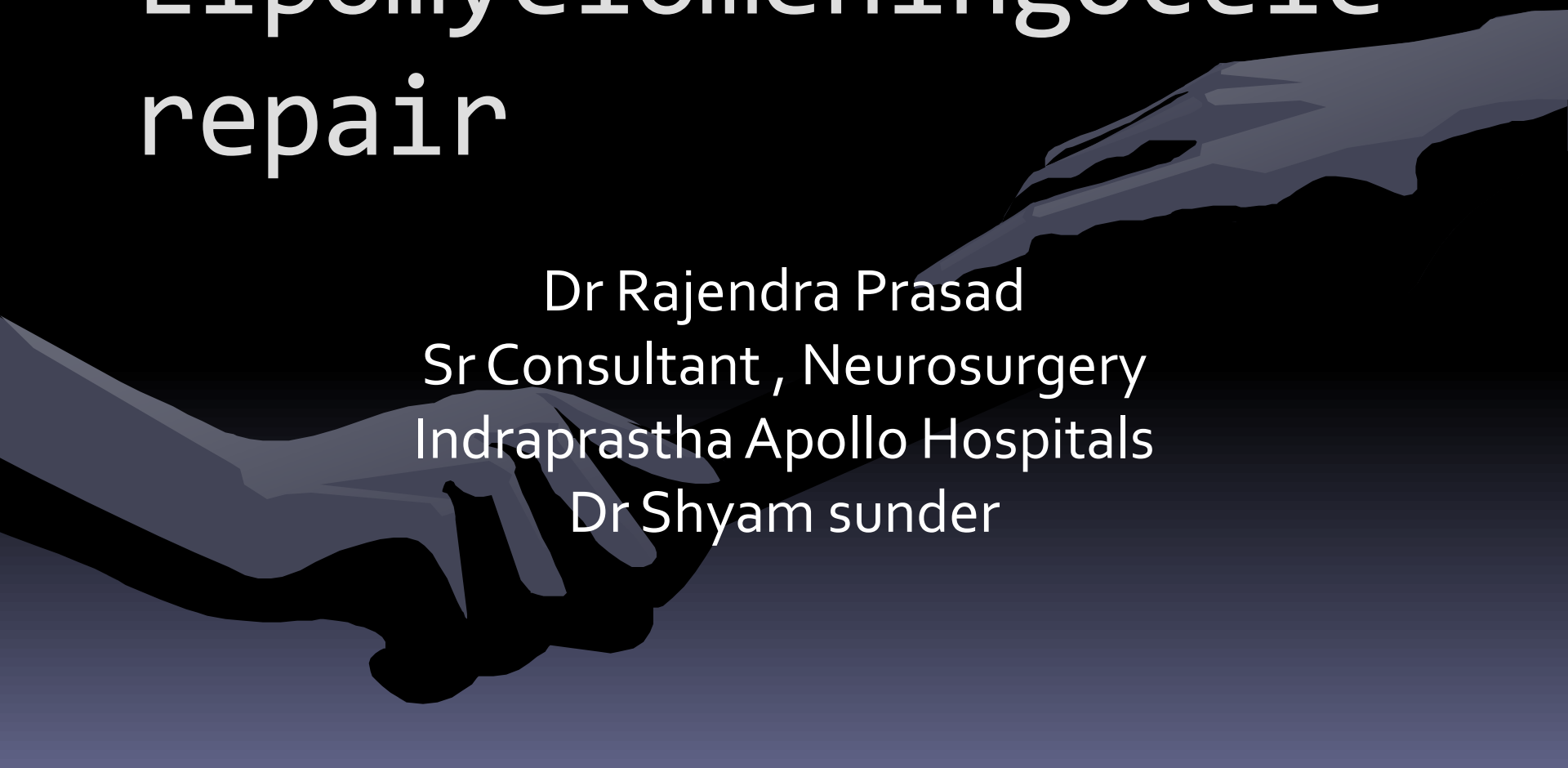
- Outcome:

-Elective LSCS done at 39 weeks
-Female, 3700 gms, with Apgars 8,9

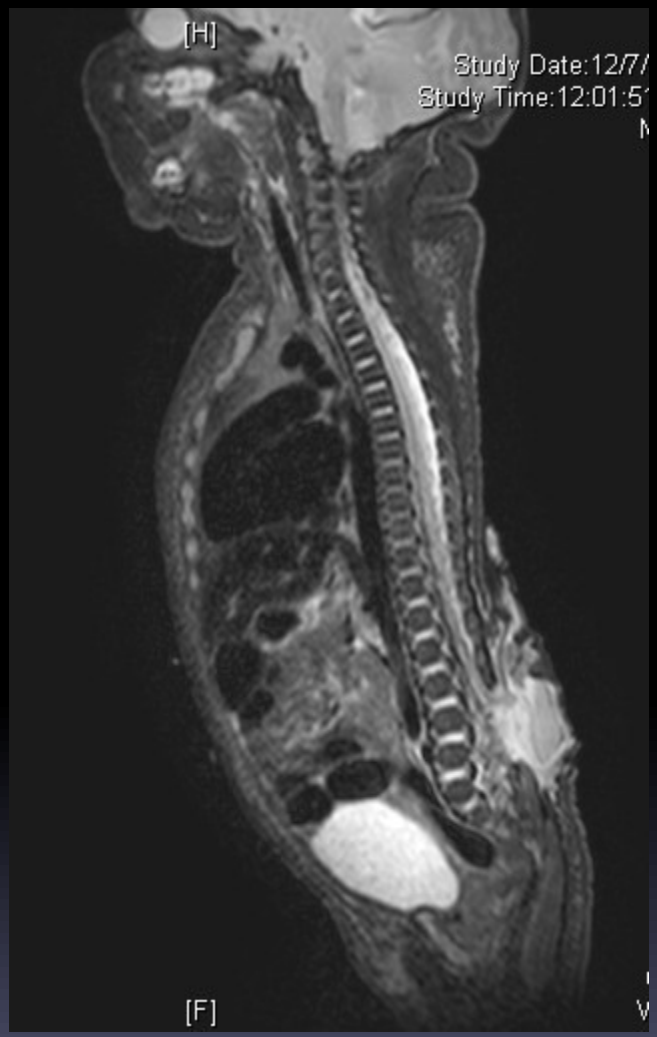
-Sac ruptured intraoperatively
-Sutured by the neurosurgeon and baby shifted to NICU for further management

Lipomyelomeningocele repair

Dr Rajendra Prasad
Sr Consultant , Neurosurgery
Indraprastha Apollo Hospitals
Dr Shyam sunder



MRI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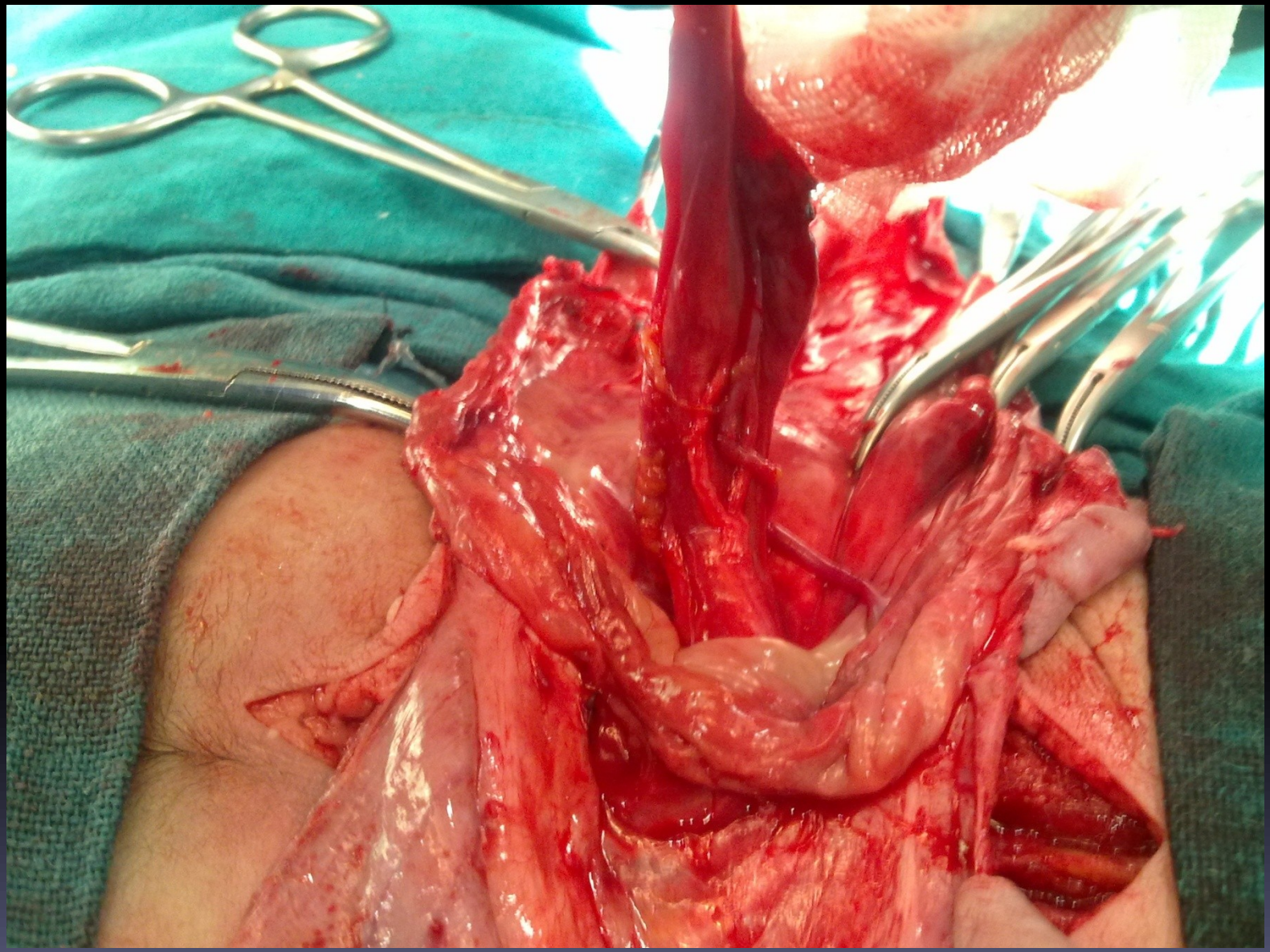
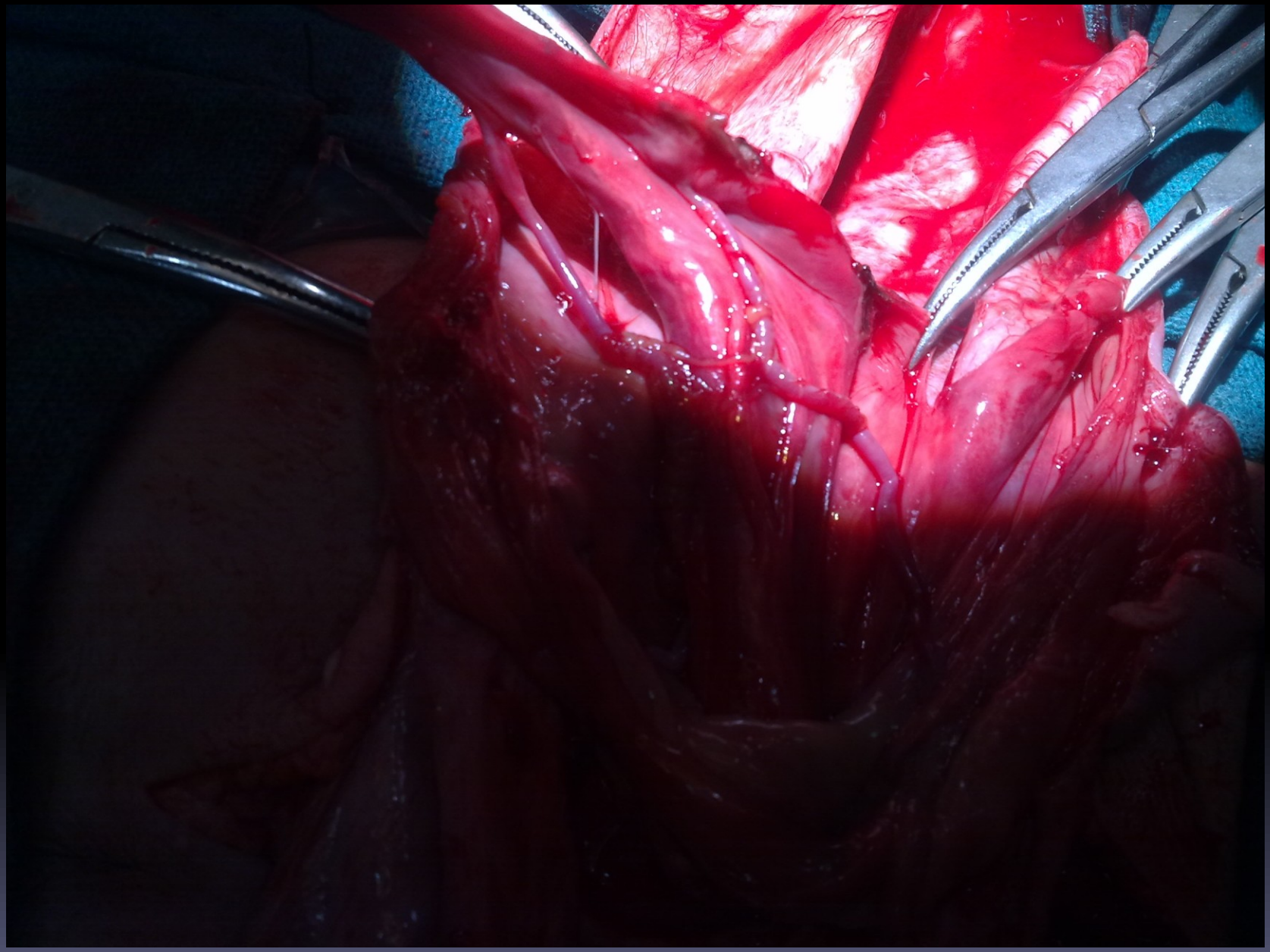
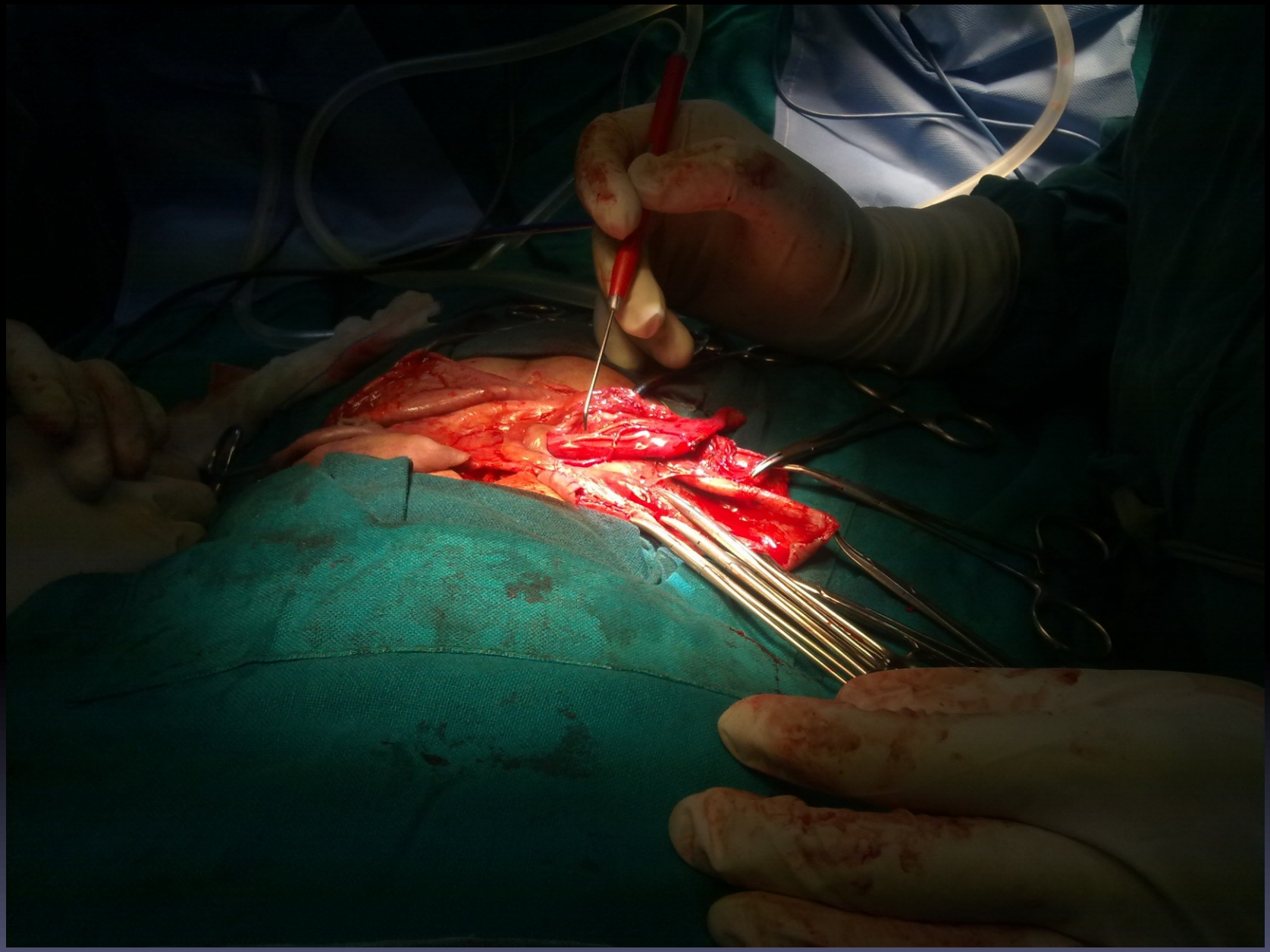
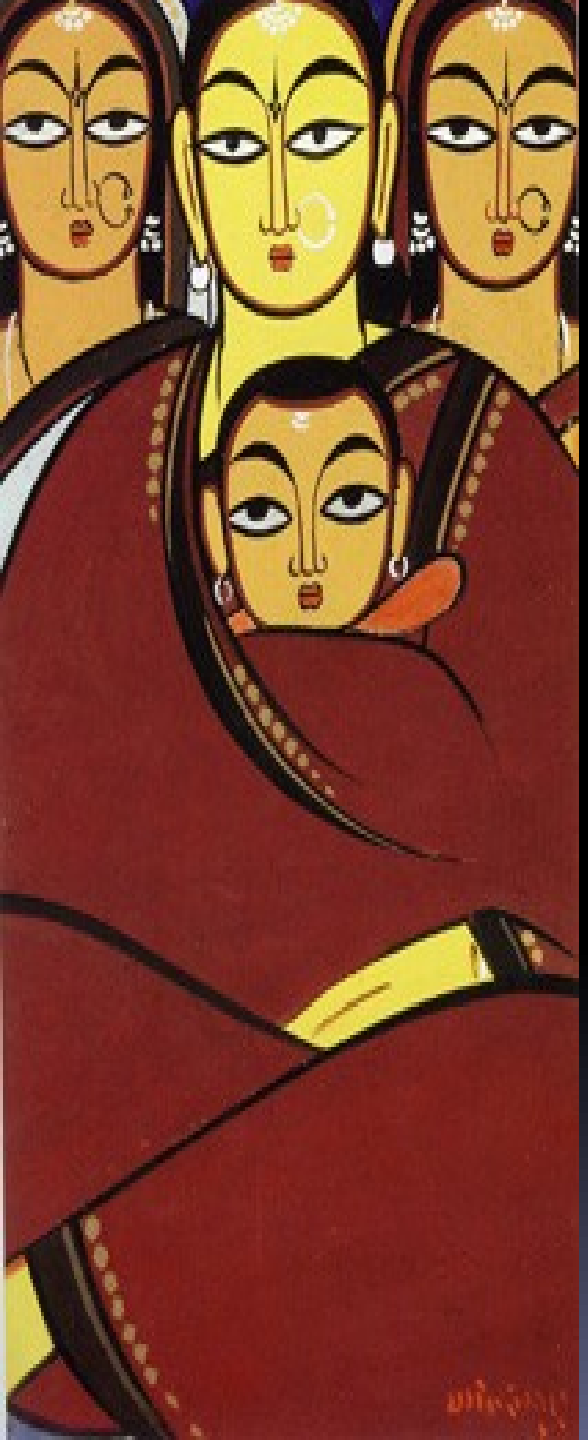






Issues in management

- Other congenital malformations.
- Surgery or no surgery?
- Timing of surgery
- Ruptured sac with CSF leak
- Risk of infection/meningitis
- Postoperative CSF leak/wound healing.
- Risk of postoperative hydrocephalus
- Further surgery for chiari malformation if it becomes symptomatic.
- Neurological recovery and bladder and bowel control.



India

Focus –Prevention by Folic Acid use

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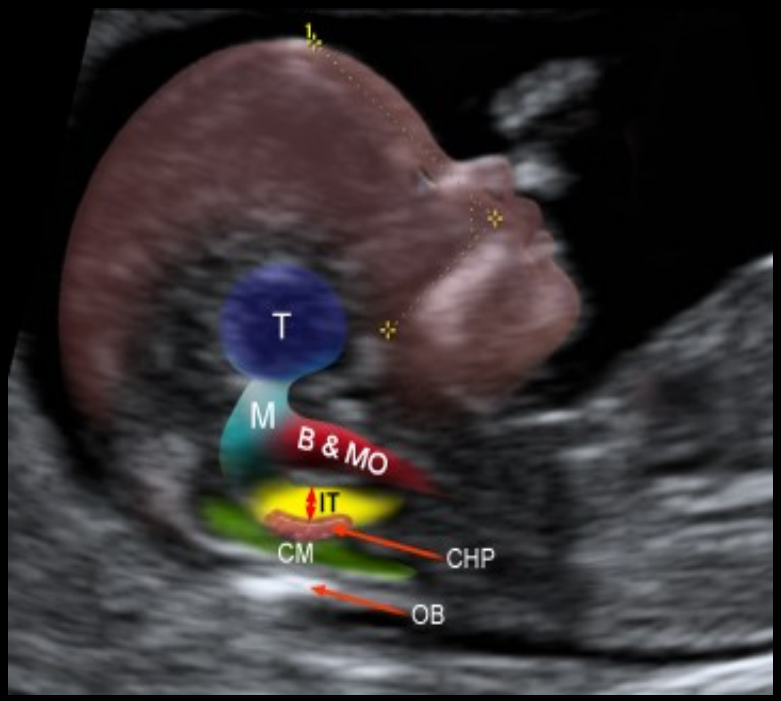
Intracranial translucency



The fourth ventricle presents as an intracranial translucency (IT)

In the normal fetuses the fourth ventricle is easily visible and the median anteroposterior diameter increases from 1.5 mm at a CRL of 45 mm to 2.5 mm at a CRL of 84 mm.

In the fetuses with spina bifida the ventricle was compressed by the caudally displaced hindbrain and no IT can be seen.

Early detection of spina bifida