Fetal intervention

Shiraz Fetal intervention team

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TEAM

- Gynecologist: Feto-maternal Surgeon
- Pediatric Surgeon
- Radiologist: MRI, Intervention
- Anesthesiologist
- Pediatric Neurosurgeon and orthoped
- Pediatric Urologist
- Pediatric Cardiologist
- Neonatologist & Genetists

Necessary Items

- Mother & Child Hospital
- Animal lab
- Instruments :fetoscope, laparoscope, Laser,
- Protocol: Pre-Post Op. Indications/contraindications
- Multicenter: Val D'Hebron & Huoston Children Hospital
- International congress: IFMSS

Fetal Surgery

- Open hystratomy
- Fetoscopy
- EXIT

Indications for fetal surgery

- Anomalies leading cause of perinatal mortality – morbidity
- TTTS
- PUV / UPJO
- CDH
- CCAM
- Meningomyelocele
- Neck mass
- Congenital band
- Gastroschisis

Fetal intervention Shiraz experience

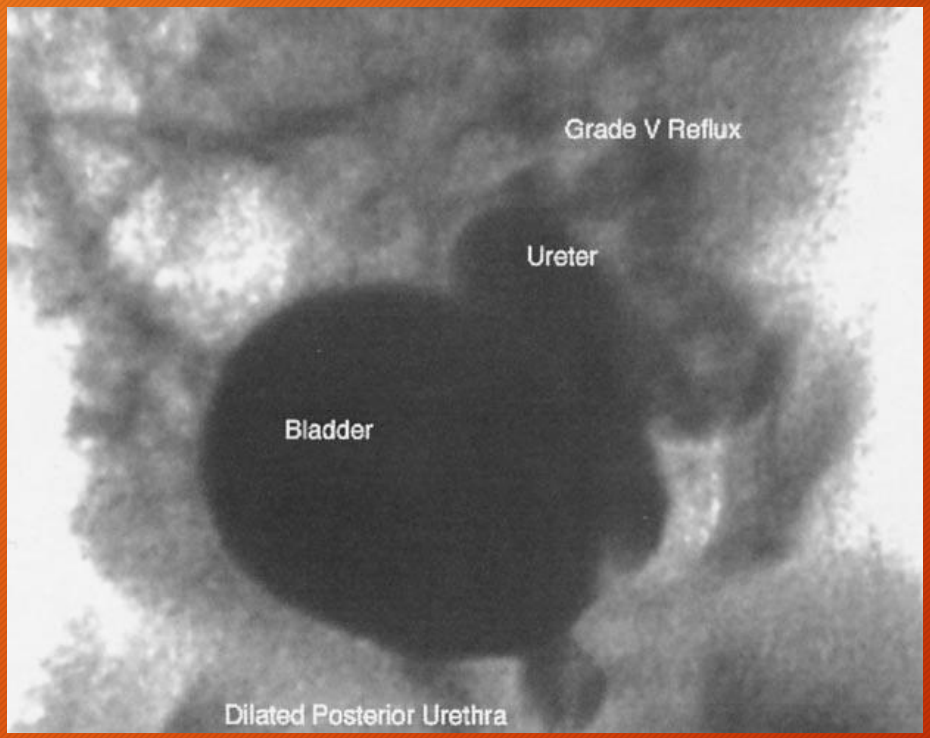
- Meningocele
- CDH
- Pulmonary stenosis
- CCAM
- Oral mass

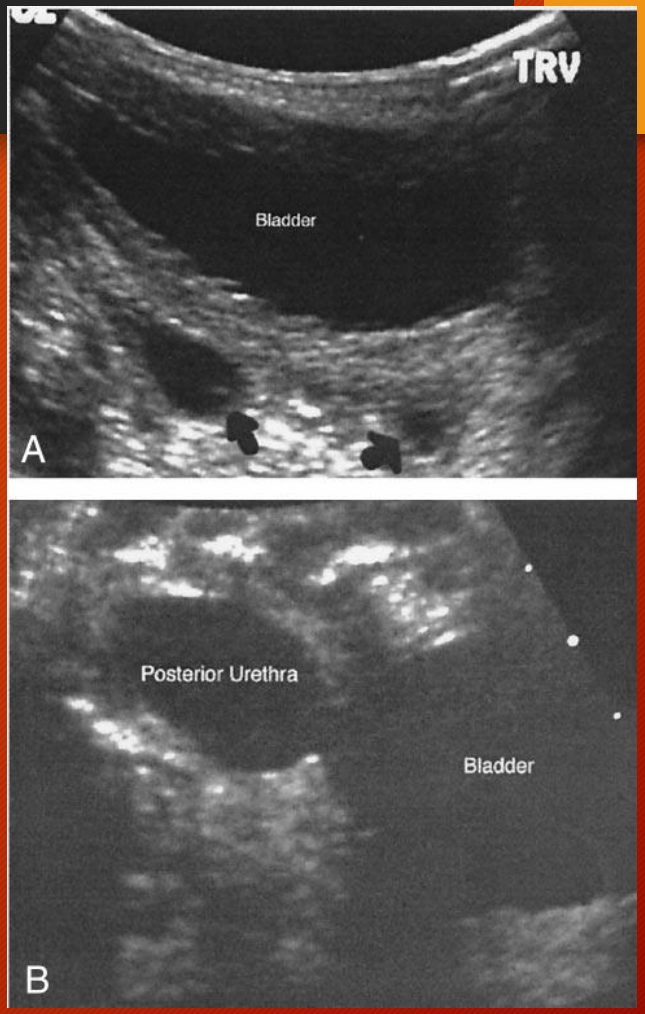
Fetal surgery criteria for PUV

- <24 wks
- Dx by sono or MRI
- No cystic dysplasia
- No increased renal echogenicity
- Normal karyotype
- Nl urine electrolyte
- Olygohydramnios

PUV- Antenatal diagnosis

- Prenatal ultrasound:



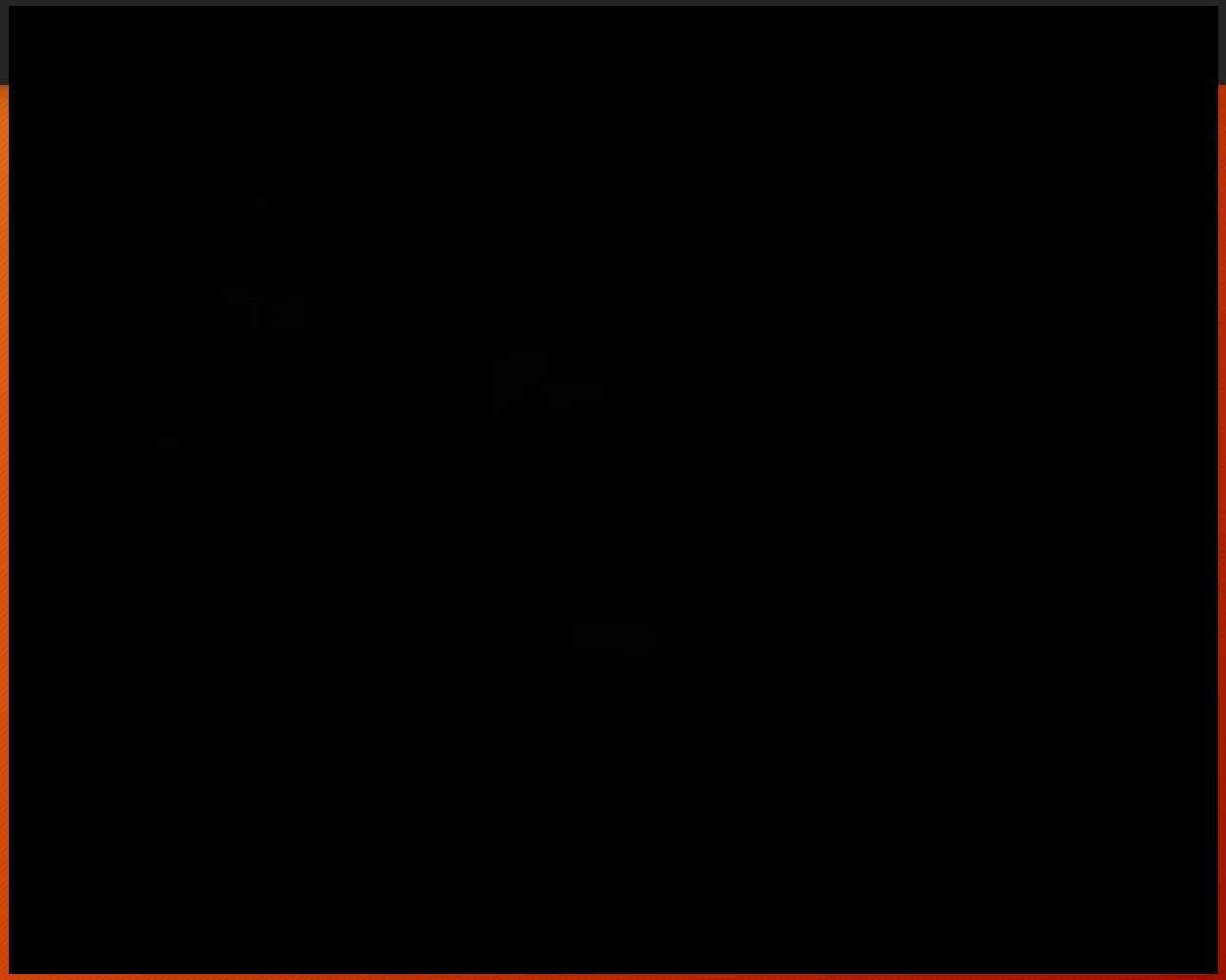


Options

- VA Shunt
- Fetoscope valve ablation
- Fetoscope urethral stent

Congenital Amniotic Band

- 24wk
- Compromise vascularity

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Thanks For Your Attention

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Open fetal surgery for spina bifida aperta

- Has been performed in hundreds of human fetuses.
- Intrauterine closure may preserve leg function and reduce the severity of hindbrain herniation and hydrocephalus

Open surgical approach

- is associated with significant maternal morbidity, as it requires maternal laparotomy and hysterotomy for fetal access
- uterine wall dehiscence or even rupture after fetal surgery or in future pregnancies

Bruner and Tulipan

- performed their pioneering surgery by fetoscopy, securing skin grafts to the malformation
- maternal laparotomy followed by transuterine trocar placement, and was quickly abandoned in favor of the open approach because of technical difficulties and unfavorable outcomes

Thomas Kohl

- During studies in inanimate models, sheep and postmortem human fetuses,
- Developed a fetoscopic approach for prenatal closure that is less invasive, access being fully percutaneous

- *Ultrasound Obstet Gynecol 2014; 44: 515-524: 51 patients*

Fetal selection

- The preferable gestational age for percutaneous fetoscopic patch coverage ranges between 20 + 0 and 25 + 6 weeks.
- The procedure can be carried out later but only when the degree of hydrocephalus is still mild and stool soiling of the lesion can be anticipated from characterization of the surgical anatomy by ultrasound

Fetal selection

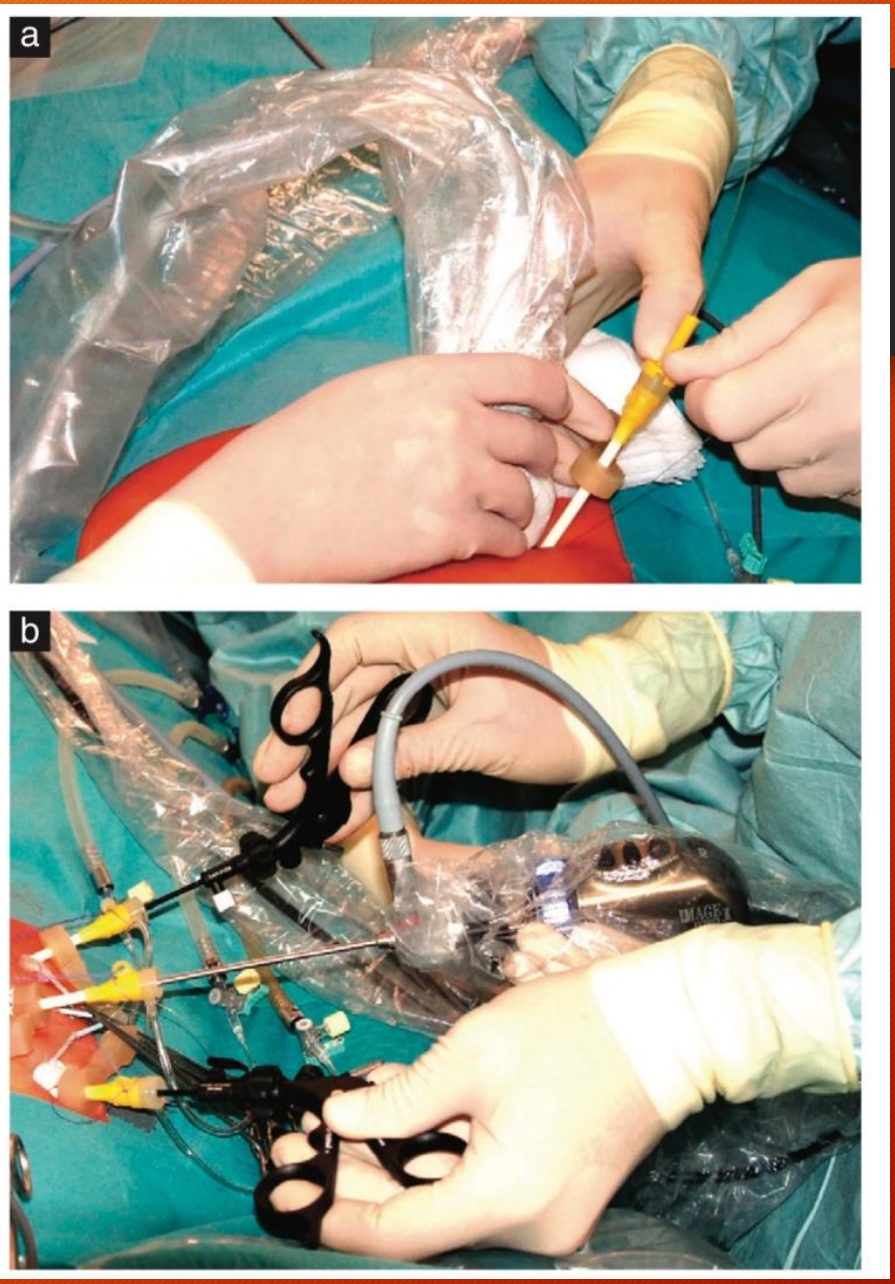
- Defect should be located between vertebrae T1 and S1
- The fetuses should be free from other major organ abnormalities on ultrasound & MRI
- Normal karyotype

Intraoperative ultrasound monitoring

- provides information critical for the safety and success of minimal-access fetoscopic closure
- selecting safe and suitable trocar sites during intra-amniotic access
- hemodynamic information
- fetoplacental circulation as well as determination of fetal heart rate and contractility

Percutaneous minimal-access fetoscopic surgery

- via three (or four) trocars,
- with an external diameter of 5 mm,
- placed into the amniotic cavity under continuous ultrasound monitoring by a Seldinger approach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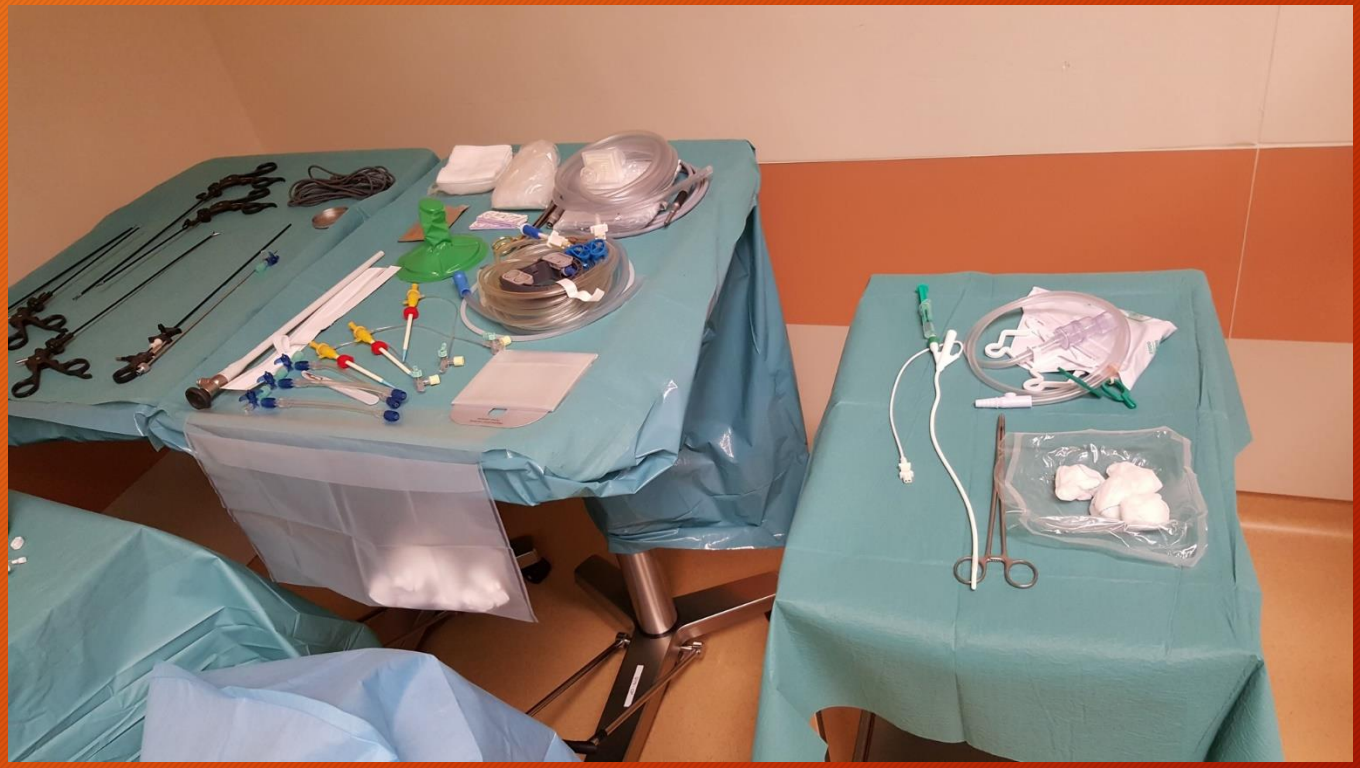
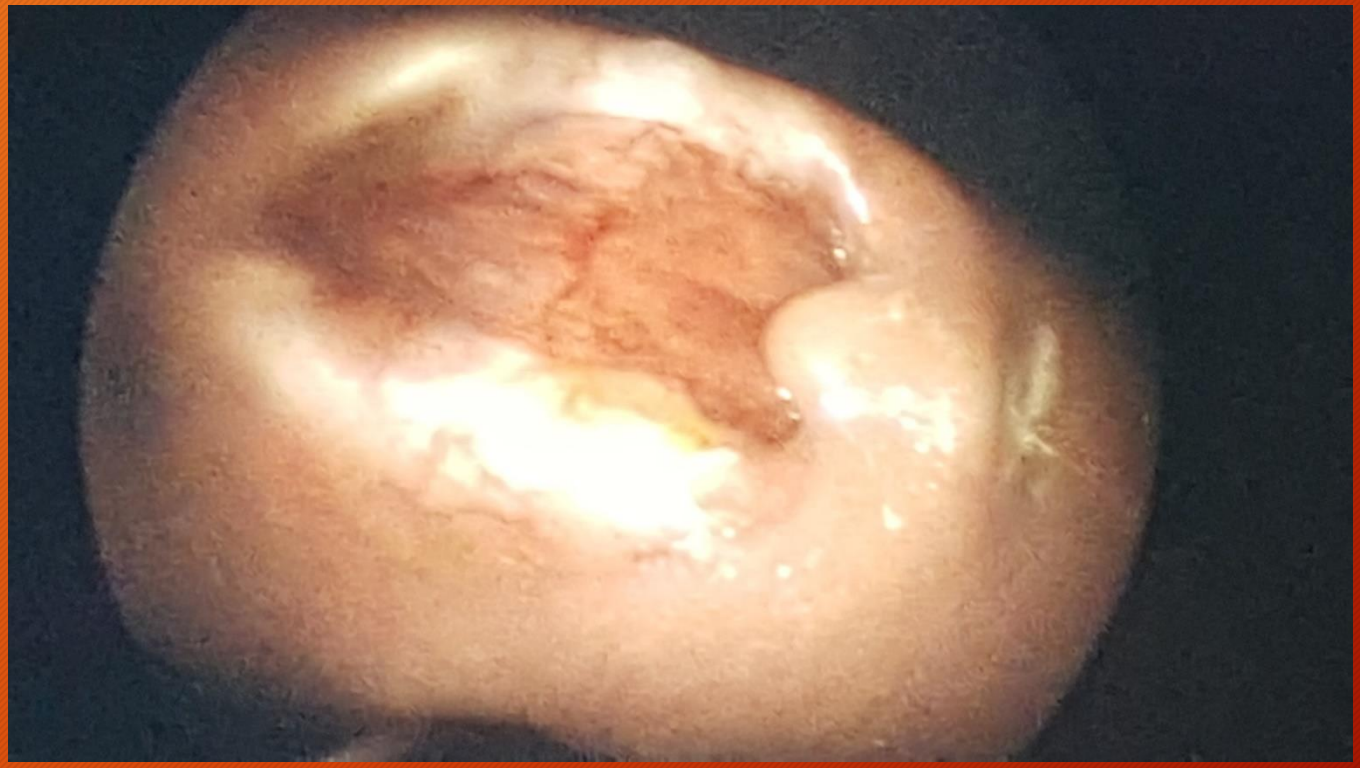
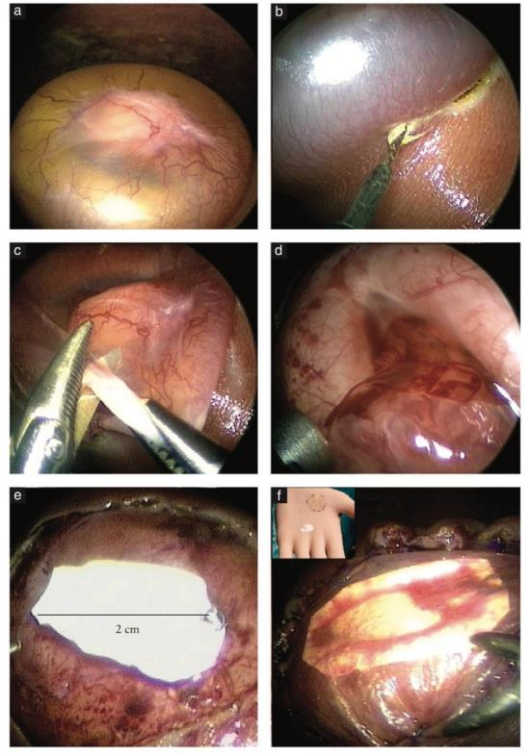
- partial removal of the amniotic fluid, partial amniotic carbon dioxide insufflation
- Using fetoscopic instruments (Karl Storz), fetal posturing is then carried out to maneuver the fetus into a position in which the malformation can be reached for the purposes of surgery

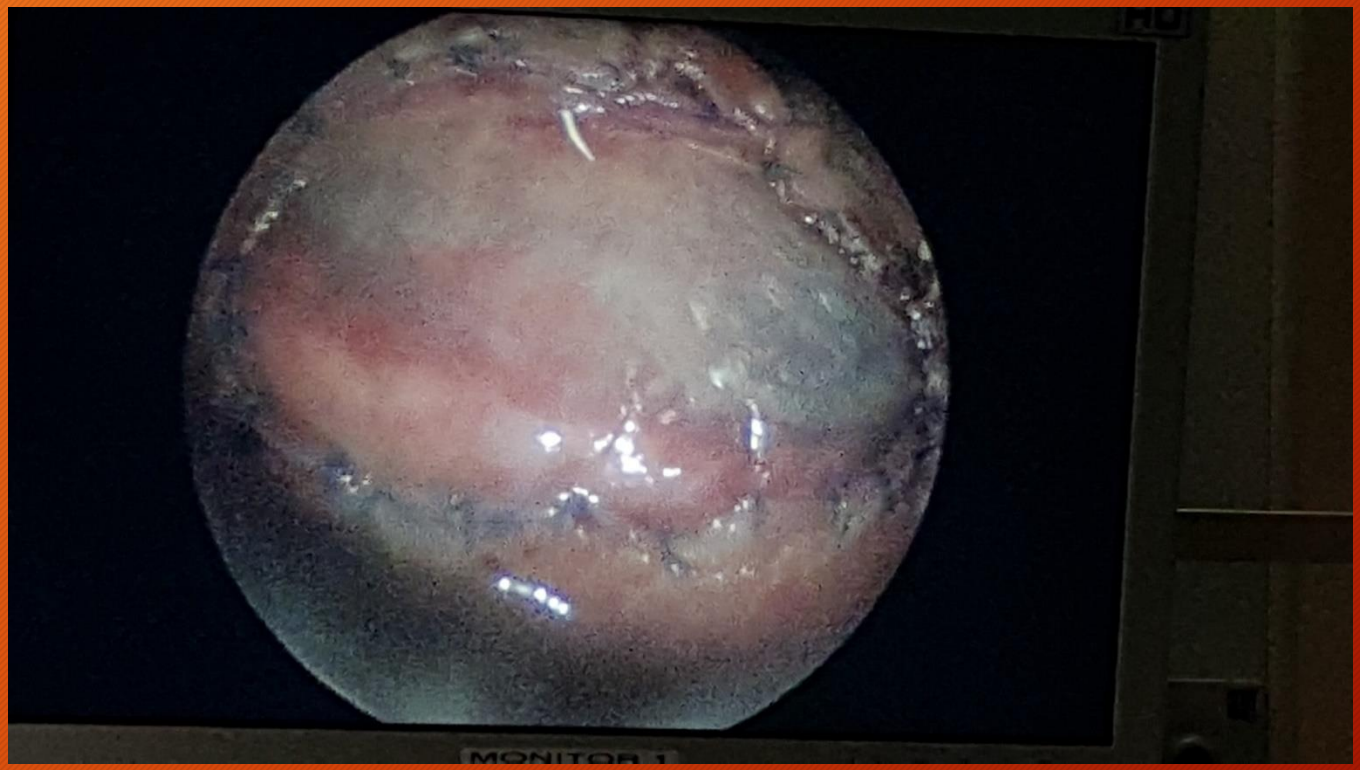


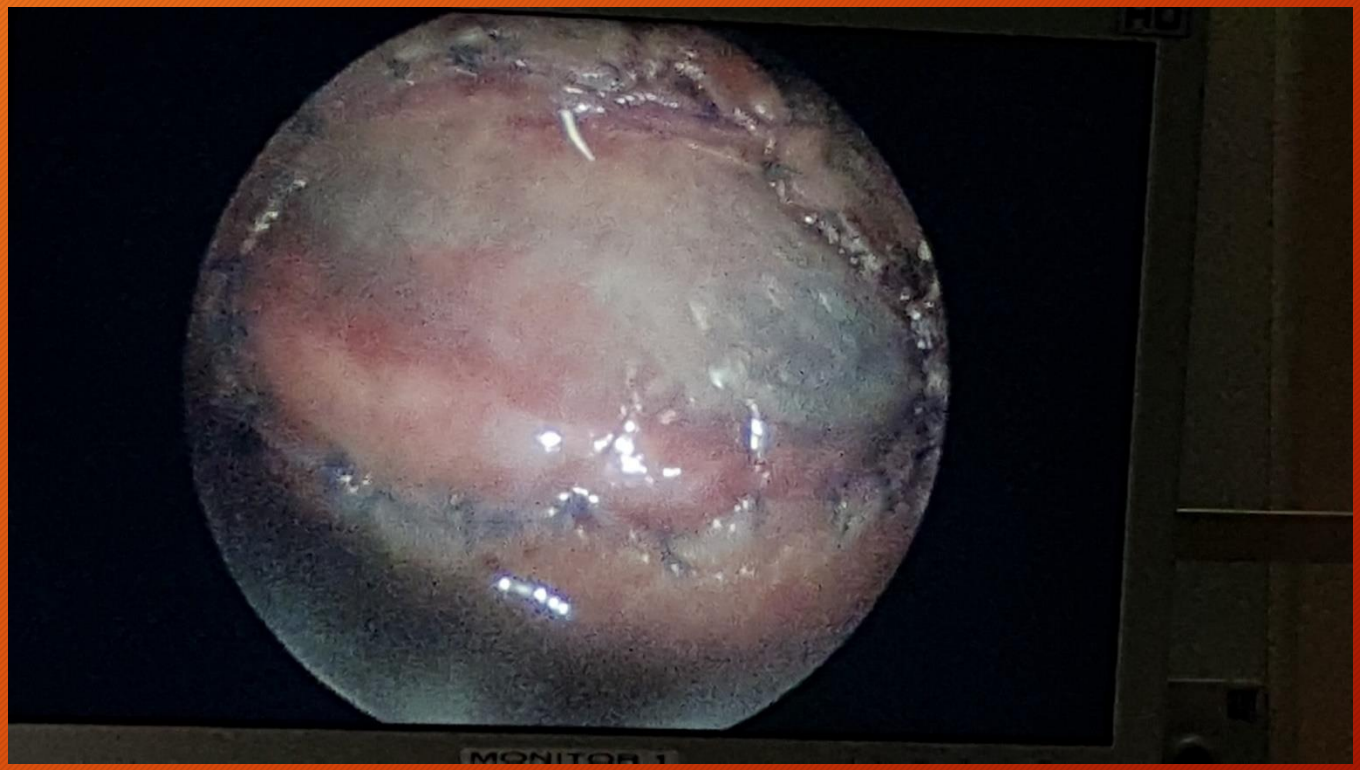


The lesion is dissected with a needle electrode and the neural tissue is carefully freed from surrounding tissues



- the neural cord is covered with one or more collagen and teflon patches
- succesful watertight coverage is demonstrated at the end of the procedure by observing bulging of the patch as well as lack of cerebrospinal fluid leakage when its surface is compressed with an instrument


MONITOR 1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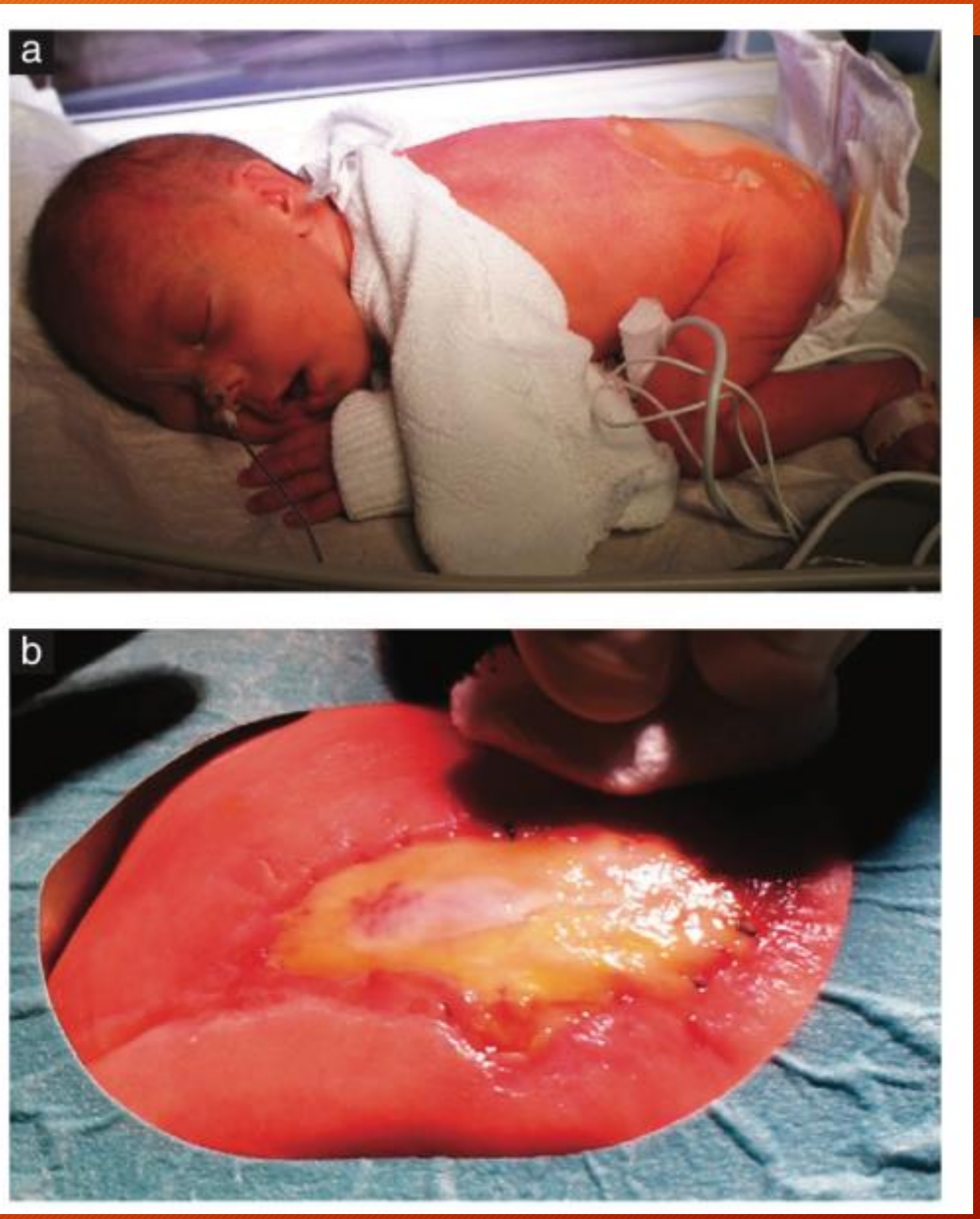
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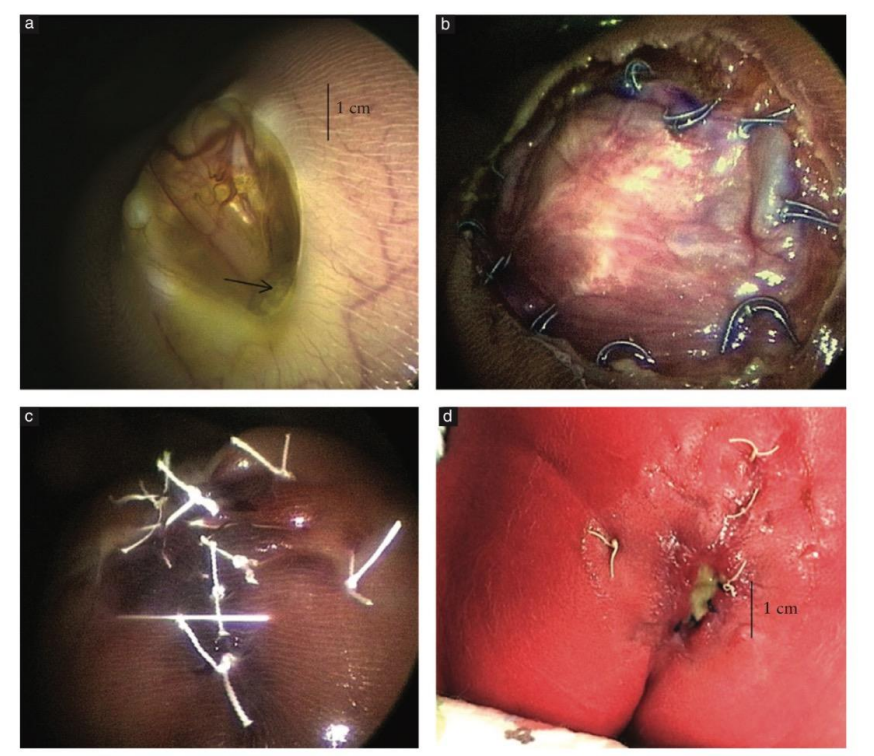
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1 cm
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