Antenatal Management & Counselling of surgical anomalies

Dr Prashant Jain
Sr. Consultant
Pediatric Surgery & Pediatric Urology
Dr BLK Superspeciality Hospital, New Delhi
Pediatric Surgery @BLK

- Pediatric Urology
- Neonatal Surgery
- Pediatric Minimal Access Surgery
- Pediatric Gastro-Intestinal Surgery
- Pediatric Oncosurgery
Advance Pediatric Surgery & Urology center

- Intensive care
- Pediatric superspecialists
- Pediatric Anesthesia
- Pediatric Radiology
- Urodynamics lab
- Nutritionist
- Rehabilitation
Pre Natal Diagnosis

- Advances in imaging & Fetal medicine

- 4% of pregnancies associated with fetal anomalies

- Foetus whose problem which has been simply ignored, becomes a potential patient
Challenge as a obstetricians….
WHY NEED OF COUNSELLING?

- SUPPORT & EMPATHY
- CORRECT FACTS

- Do not let them leave your office without having all of their immediate questions answered & addressed
Alkazaleh et al. found that women valued most “immediate, clear information with different options explained, enough time to ask questions, information regarding follow-up care, privacy and the sympathy of the person giving the bad news.”
Misinformation

Huge source of
MIS_INFORMATION
YOUR CHILD IS HAVING MAJOR SURGICAL ANOMALY

- Is anomaly compatible with life?
- What is the percentage of survival?
- Any other associated anomaly?
- What are the treatment options?
- Does he require surgery immediately after delivery?
- Risk and complications of surgery
- Any medical management or option for termination?
- What will be quality of life?
- What will be the finances involved?
Team: Multidisciplinary Approach

- Obstetrician
- Radiologist
- Geneticist
- Neonatologist
- Pediatrician
- Pediatric surgeon

Share information
Deliver final statement: No conflicting information
Good acceptance for malformation
AIM:

- Plan the type of delivery
- Plan the place of delivery
- Plan the investigations before and after delivery
- Plan the treatment after birth
- Prognosticate the problem (mortality and morbidity)
- Expected hospital course
- Finances involved
- Assess whether the problem can recur in future pregnancies

Improve the outcome and quality of life
Surgical Anomalies

- Urological anomalies
- Diaphragmatic hernia
- Intestinal anomalies
- Abdominal Cysts
- Meningomyelocele
- Anterior Abdominal wall defects
- Cleft lip & Palate
- Congenital tumors
Antenatal scan: 28 wks

- Herniation of bowel into the chest
- Herniation of liver
- Mediastinal shift
- Congenital diaphragmatic hernia
Counseling

- Anatomy
- Natural course of the disease
- Associated Problems:
  - 50% are isolated
  - Pulmonary hypoplasia & hypertension
  - Cardiac & chromosomal anomaly (50%)
Prognosis

- Liver herniation and reduced lung volumes correlates with poor survival
- Lung head ratio by experienced sonologists
- Isolated CDH with LHR > 1.4 without liver herniation has good prognosis
- Risk of polyhydramnios
- Intrauterine fetal demise (3-8%)
Recommendation

1) Regular antenatal check ups

2) Ultrasounds at 30 & 32 wks and then weekly

3) Delivery to be planned after 39 wks in a center where neonatologist and pediatric surgeons are available

4) Routine cesarean is not beneficial
Perinatal Management

- Need of Post natal stabilization; SURGERY IS NOT EMERGENCY

- Need of ventilation, iNO or ECMO and their complications (survival >80%)

- Surgical procedure

- Finances
Antenatal Hydronephrosis
Antenatal Hydronephrosis

- Incidence: 1 in 1000 pregnancy
- Dilatation of pelvicalyceal system
- ANY DILATATION EVEN IF MILD CAN NOT BE IGNORED
- USG is a good modality to follow & assess the severity of hydronephrosis
# Outcome of Antenatal hydronephrosis

<table>
<thead>
<tr>
<th>Etiology</th>
<th>All cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient hydronephrosis</td>
<td>41-88</td>
</tr>
<tr>
<td>Pelviureteric junction obstruction</td>
<td>10-30</td>
</tr>
<tr>
<td>Vesicoureteric reflux</td>
<td>10-20</td>
</tr>
<tr>
<td>Vesicoureteric junction obstruction, megaureter</td>
<td>5-10</td>
</tr>
<tr>
<td>Multicystic dysplastic kidney</td>
<td>4-6</td>
</tr>
<tr>
<td>Duplex kidneys (±ureterocele)</td>
<td>2-7</td>
</tr>
<tr>
<td>Posterior urethral valves</td>
<td>1-2</td>
</tr>
<tr>
<td>Others: Urethral atresia, urogenital sinus, prune belly syndrome, tumors</td>
<td>Uncommon</td>
</tr>
</tbody>
</table>

Kidney

Stenosis of the ureteropelvic valve

Ureter

Stenosis of the ureterovesicular junction

Bladder

Stenosis of the posterior urethral valve

Urethra
The outcome of ANH depends on the underlying etiology.

Although ANH resolves by birth or during infancy in 41-88% patients.

Urological abnormalities requiring intervention are identified in 4.1-15.4%
**Management**

- Monitoring of dilatation with USG
  - Moderate/ severe Hydronephrosis
  - Bilateral Hydronephrosis
  - Hydroureter
  - Dilated Posterior urethra

- Amniotic fluid should be monitored in all cases of urinary tract obstruction

- Fetal intervention

- Pregnancy should be carried till term unless complicated by oligohydramnios
Antenatal hydronephrosis

- Antenatal scan - 32 wks
- Lt hydronephrosis with dilated pelvicalyceal system; No hydroureter
- AP (Antero-posterior) diameter of Lt renal pelvis: 16 mm
- AFI: 13

How to counsel?
Counseling is Challenge…..

- Transient dilatation or pathological PU junction obstruction
- Close follow up with USG, Renal scans and MCU studies
- Spontaneous resolution
- Need of surgery and type of surgery
- When to intervene?
Definition of ANH by AP(Antero-Posterior) Diameter of Renal Pelvis

<table>
<thead>
<tr>
<th></th>
<th>Second trimester</th>
<th>Third trimester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mild</strong></td>
<td>4 to &lt;7 mm</td>
<td>7 to &lt;9 mm</td>
</tr>
<tr>
<td><strong>Moderate</strong></td>
<td>7 to 10 mm</td>
<td>9 to 15 mm</td>
</tr>
<tr>
<td><strong>Severe</strong></td>
<td>&gt;10 mm</td>
<td>&gt;15 mm</td>
</tr>
</tbody>
</table>
Risk Of Postnatal Pathology


- Mild: 11.8%
- Moderate: 44.1%
- Severe: 88.3%
• Isolated problem
• Moderate hydronephrosis (Resolution: 40%)
• CAN NOT BE IGNORED
• Continue pregnancy till term
• Repeat USG 48-72hrs
• After delivery will require regular follow up with USG and renal scans
• Need of chemoprophylaxis
• Indications and type of surgery
<table>
<thead>
<tr>
<th>Duration</th>
<th>Right AP of Pelvis Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 wks scan</td>
<td>6 mm</td>
</tr>
<tr>
<td>28 wks scan</td>
<td>8 mm</td>
</tr>
<tr>
<td>36 wks scan</td>
<td>7 mm</td>
</tr>
<tr>
<td>Before discharge</td>
<td>7 mm</td>
</tr>
<tr>
<td>USG at 1mth</td>
<td>5 mm</td>
</tr>
<tr>
<td>USG at 3mth &amp; 1 year</td>
<td>No dilatation</td>
</tr>
</tbody>
</table>
Antenatal Scan 32 wks

- Bilateral hydronephrosis and hydroureter
- Bilateral AP diameter 7mm
- Bilateral echogenic kidneys
- Bladder full; Key hole sign
- AFI 8
Antenatal Scan: Hydroureteronephrosis

- Vesico-ureteric reflux
- Vesico-ureteric junction obstruction
- Posterior Urethral Valve
Counseling

- Obstruction at vesico-urethral junction
- Antenatal scan at regular scans to monitor fetal growth & amniotic fluid
- To continue pregnancy till term
- To be investigated immediately after delivery
- Need for surgery (Endoscopic Fulgaration)
- Need for long term follow up & medications
- Risk of ESRD in one third cases
37 wks, LSCS, 1.6 kg
USG: B/L HN & HU
Thinned out renal parenchyma
Thickened and distended bladder

Catheterised
Serum Na: 132
Serum K: 5.3
S. Creatinine: 1.6
VBG: Normal
Urine C/S: sterile
MCU

Endoscopic Fulguration
Intestinal abnormalities

- Hyperechohogenic Bowel in 2\textsuperscript{nd} trimester
- 75\% of the cases have normal outcome
- Good prognosis as an isolated disorder
- Needs detailed anatomical survey

- Soft marker of trisomy 21
- Intrauterine CMV infection or cystic fibrosis
- IUGR
- Intra amniotic hemorrhage
Intestinal abnormalities

Bowel Dilatation

- Dilated Bowel upto 7 mm is normal
- Detection rate is 40%
- Echogenic bowel with dilatation
- Polyhydramnios

- Intestinal atresia
- Meconium ileus
- Meconium peritonitis
Counseling

• Prognosis is good in intestinal obstruction
• Need of surgery
• Need of Parenteral nutrition
Tracheo-Esophageal Fistula

- Difficult to diagnose

- Absent stomach bubble with polyhyramnios is suggestive of pure esophageal atresia

- Polyhydramnios is present in one third of patients with distal TEF

- 50% of them are associated with other anomalies
Counseling

- Prematurity, weight and associated anomalies
- Surgery and complications
- Staged surgery
- Early and delayed complications
- Finances

<table>
<thead>
<tr>
<th>Group</th>
<th>Survival</th>
<th>Waterston Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100%</td>
<td>Birth wt &gt;2500gm, otherwise healthy</td>
</tr>
<tr>
<td>B</td>
<td>85%</td>
<td>Birth wt 2000-2500, otherwise well, or Higher wt with moderate anomaly (non cardiac anomaly plus PDA, VSD, ASD)</td>
</tr>
<tr>
<td>C</td>
<td>65%</td>
<td>Birth wt &lt; 2000gm &amp; otherwise well, or Higher wt with sever associated cardiac anomaly</td>
</tr>
</tbody>
</table>
Double Bubble

- Duodenal atresia
- Polyhydramnios (50%)
- Screening for other anomalies
  - Cardiac (30%)
  - Trisomy 21(30%)
Intestinal Anomalies

- Maturity
- No indication for changing the route of delivery
Cystic Lesion in abdomen

- Ovarian Cyst
- Mesenteric/lymphatic Cyst
- Choledochal Cyst

- Prognosis good
- Surgery to be done after imaging
Anterior abdominal wall defects

- Gastrochisis: Herniation of intestines through right paraumbilical defect
- Isolated anomaly
- Elevated maternal serum alpha fetoprotein
- Growth failure (30-60%), fetal demise and premature delivery
- Fetal monitoring is important because of growth failure and amniotic fluid abnormalities
- Not an indication for early delivery
- No indication for Cesar
- Planned in set up where pediatric surgeon is readily available
- Prognosis is good with survival of 90%
Omphalocele

- Can be detected at 10-14 wks
- 25-50% cases associated with other anomalies
- Close fetal monitoring
- No benefit of cesarean section
- Arrangements of repair as soon as possible

- May require staged repair
- Survival: 70-90%
Meningomyelocele

• Can be detected by 12 wks
• Prognosis
  – Depends on level and severity/length of defect
  – Presence of neural tissue in sac
  – Severity of Presence of hydrocephalus
• Closed better prognosis than open
Counseling

• What Surgical treatment?
• What quality of life can be given to the child?
• Risk of neurological and mental deficits
• Involves enormous personal, familial and social costs
• Proper counseling regarding bringing up of a handicapped child should be done
• Prevention
• Risk in subsequent pregnancies
Ventriculomegaly

- Dilatation of lateral ventricles
- Atrial diameter more than 10mm
- > 15 mm is severe: Poor prognosis
- Associated with neurodevelopmental problems and death
Cleft lip and Cleft Palate

• 70 percent of Cleft lip/Palate & 50 percent of Cleft Palate and are non-syndromic
• Other structural anomalies should be looked for especially with midline clefts
• Karyotyping to be done when found to be associated with other anomalies
• Diagnosed by 13-14 wks
• Feeding & airway issues
• Surgical timings
Defects Usually Managed by Pregnancy Termination

- Anencephaly, hydranencephaly, holoprosencephaly
- Severe anomalies associated with chromosomal abnormalities (e.g., trisomy 13)
- Bilateral renal agenesis, infantile polycystic kidney disease
- Severe untreatable inherited metabolic disorders (e.g., Tay-Sachs disease)
- Lethal bone dysplasias (e.g., thanatophoric dysplasia, recessive, osteogenesis imperfecta)
Defects Best Corrected After Delivery

- Intestinal atresias
- Meconium ileus (cystic fibrosis)
- Enteric cysts and duplications
- Small intact omphalocele and gastroschisis
- Hydronephrosis
- Simple cystic hygroma
- Small sacroccocygeal teratoma, mesoblastic nephroma, neuroblastoma
- Benign cysts (e.g., ovarian, mesenteric, choledochal)
Fetal Conditions That May Benefit from Treatment Before Birth

- Urinary obstruction (urethral valves)
- Cystic adenomatoid malformation
- Congenital diaphragmatic hernia
- Large Sacrococcygeal teratoma
- Meningomyelocele
- Cleft lip and palate
Defects that may lead to Cesarean delivery

- Conjoined twins
- Giant or ruptured omphalocele
- Severe hydrocephalus
- Ruptured meningomyelocele
- Large sacrococcygeal teratoma
Summary

• Tough job breaking the “BAD NEWS”

• Handled carefully will all facts

• Acceptance and Anxiety

• Multidisciplinary approach
Coming Together is a Beginning. 
Keeping Together is Progress. 
Working Together is Success. 
-Henry Ford