TÜRKİYE MATERNAL-FETAL TIP ve PERİNATOLOJİ DERNEĞİ

ULTRASONOGRAFİ KURSU

8-10 KASIM 2013 - HARBİYE ASKERİ MÜZE, İSTANBUL

SAĞLIK BAKANLIĞI

27. BURAK KADIN SAĞLIĞI EĞİTİM VE ARAŞTIRMA HASTANESİ

FETAL ÜRİNER SİSTEM OBSTRÜKTİF ÜROPATİLER

Maternal - Fetal Tıp ve Perinatoloji Derneği

Türkiye

23-06-1998

Dr. Şevki ÇELEN

ZTB Kadın Sağlığı EAH

Perinatoloji Kliniği

Prenatal dönemde tespit edilen anomalilerin %20-30'u böbrek ve üriner sisteme aittir.

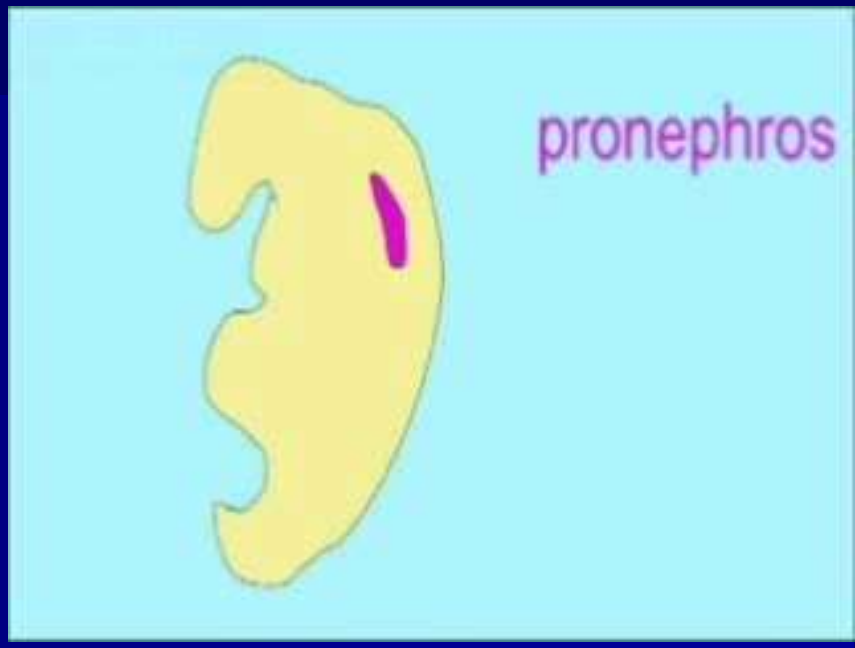
Toplumda ultrasonografik olarak tespit edilen kongenital böbrek ve üriner sistem anomali sıklığı 1-7/1000

Dugoff L. Prenat Diagn 2002; 22:316.

Embriyoloji

İntemediate mesodermden;

- **Pronefroz**
- **Mezonefroz**
- **Metanefroz (metanefrik blastem)**



Üreterik tomurcuktan;

- **Distal toplayıcı kanallar ve üreterler**
- **Metanefrik blastemi indükler**

Ürogenital sinüsten;

- **Mesane ve dış genital organlar oluşur.**

Renal inceleme

10-12 hft 18-22 hft

Boyut-Ekojenite-Lokalizasyon

Mesane

- 10-12 hft Usg
- Perivesikal (umbilikal) arterlerin color doppler

11-14 hf, fetal mesane ortalama çapı <7mm

Major renal anomaliler

Unilateral-Bilateral

Renal agenezi
Displastik böbrek hast
Alt üriner obstrüksiyonlar

Renal yetmezlik
Ciddi oligohidramnion

Potter sekans anomalileri

- **Potter yüzü**
- **Clubfeet**
- **İskelet deformiteleri**
- **Ekstrarenal anomaliler**

PERINATAL LESSONS FROM THE PAST

Dr Edith Potter (1901–1993) of Chicago: pioneer in perinatal pathology

P M Dunn

Arch Dis Child Fetal Neonatal Ed 2007;**92**:419–420. doi: 10.1136/fnn.2005.091397

Dr Edith Potter (1901–93).

Am J Obstet Gynecol. 1946 Jun;51:885-8.

Facial characteristics of infants with bilateral renal agenesis.

POTTER EL.

Renal agenesis

Üreterik tomurcuk metanefrik blasteme penetre olmazsa → **Renal Agenezi**

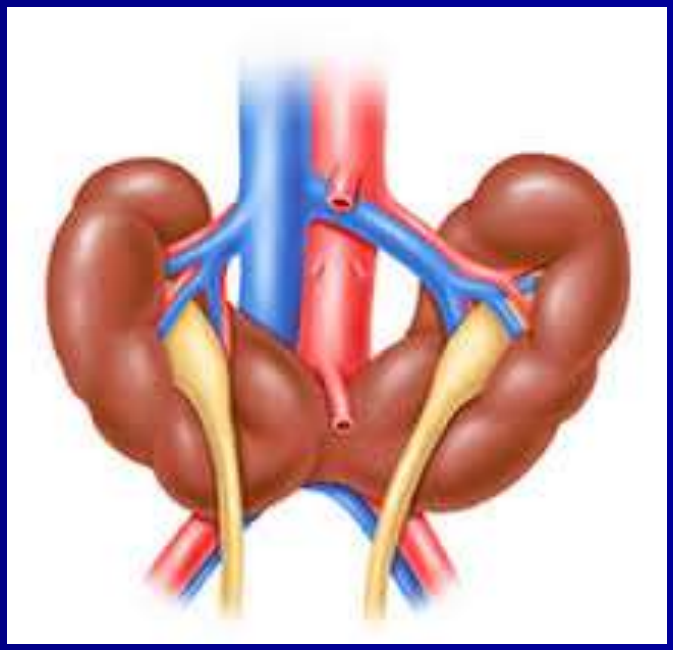
Ektopik böbrek

Böbrekler sakralden lumbal bölgeye migrasyon yapmazsa → **Ektopik Böbrek**

Pelvis yerleşimli(%55)-en sık

Füzyon anomalileri-Atnalı böbrek

Rotasyon ve migrasyon öncesi alt pollerin füzyonu → **Atnalı Böbrek**



Kistik-Displastik Böbrek

Infant PDB-Potter tip I

- Toplayıcı kanalların non-obstrüktif kistik dilatasyonu
- Oto. Ressesif geçiş
- Artmış hacim ve ekojenite-korteks medulla ayrımı yapılamaz
- 16. Hft sonrası ciddi oligohidramnion

Multikistik DB-Potter tip II

- %75-80 unilateral non-kominikan kistler
- **Yenidoğan; en yaygın batında kitle nedenlerinden**
- **Çocukluk; kistik renal hast en sık rastlanan tipi**
- %15-25'inde ekstrarenal anomaliler görülür

Adult PDB-Potter tip III

- Oto. dominant geçiş
- **En sık herediter böbrek hastalığı**
- Korteks medulla ayrımı belirgindir
- Semptomlar genellikle 3-5 dekatta - <%1antenatal
- Genellikle normal mesane ve amnion

Obstrüktif KD-Potter tip IV

- Sıklıkla bilateral-normalden küçük böbrekler
- Erken ve ciddi obstrüksiyon sonucu
- Parankimde artmış ekojenite-perikortikal kistler

Obstrüktif üropatiler

Hidronefroz

- Yenidoğanda 2-10/1000
- **En yaygın fetal renal anomali**
- Böbrek toplayıcı sist. dilatasyonu

Lee RS Pediatrics 2006; 118:586.

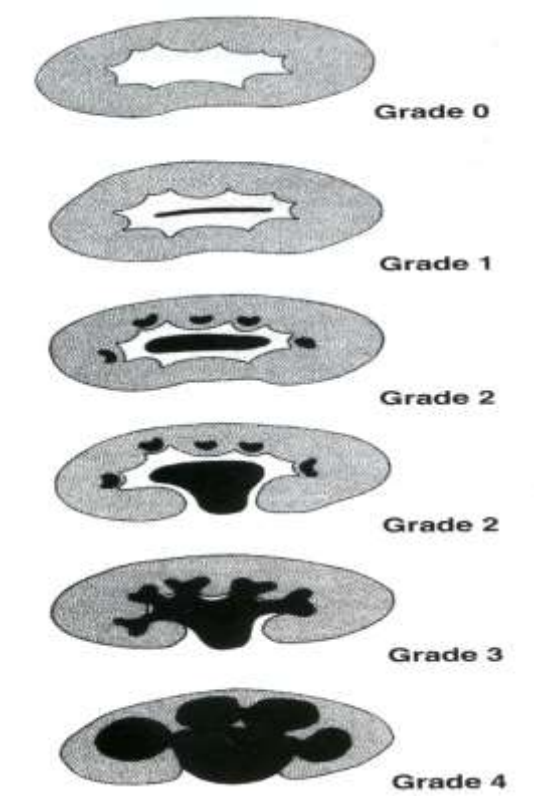
Hidronefroz

- **UPJ obst.-Toplayıcı sist. geçici dilatasyonu**
- **VUR**
- Megaüreter
- Çift toplayıcı sist.
- PUV
- MMIH send

Hidronefroz

Society of Fetal Urology

- Pelvik dilatasyon derecesi
- Kalikseal dilatasyon varlığı
- Parankim inceliği ve atrofisi



Grade	Pelvis	Parankim
0	İntakt	Normal
I	Hafif dilatasyon	Normal
II	Orta derece dilatasyon	Normal
III	Belirgin dilatasyon	Normal
IV	İleri derecede dilatasyon	İncelmiş

Hidronefroz

Pelvis AP çap <4 mm 32 hft
<7 mm33-40 hft

Lee meta-analiz 2006	second trimester	third trimester	Renal/Urinary tract pathology
Mild	<7 mm	<9 mm	12 %
Moderate	7 to 10 mm	9 to 15 mm	45
Severe	>10 mm	>15 mm	88

Lee RS Pediatrics 2006; 118:586.

Prenatal ultrasonografide gebelerin **%0.5-4.5'inde** tespit edilebilir.

	RPD	GEBE	Hidronefroz	%
DUDLEY prospektif 1997	>5mm	18.766	100	**0.6**
ISMAILI prospektif 2003	≥4 mm	5.643	258	**4.5**
LEE meta-analiz 2006	değişken	104.572	1.678	**1.6**

Lee RS Pediatrics 2006; 118:586.

Ismaili K Am J Obstet Gynecol 2003; 188:242.

Dudley JA Arch Dis Child Fetal Neonatal Ed 1997; 76:F31

DOI: 10.1002/pd.2893

ORIGINAL ARTICLE

Prenatal Diagnosis 2012, 32, 519–522

Postnatal outcome of prenatally diagnosed severe fetal renal pelvic dilatation

Sailesh Kumar[1]*, Shikha Walia[1], Obori Ikpeme[2], Eko Zhang[1], Gowrishankar Paramasivam[1], Sanjiv Agarwal[2], Karl Murphy[1,3], Jane Deal[4] and Lorin Lakasing[1,3]

Severity of RPD	Mild/moderate	Severe
Number of cases	659	103
Male : female ratio	1.6:1	5:1
Associated anomalies	105 (16%)	20 (19.4%)
Isolated RPD	554 (84%)	83 (80.6%)
Progression of severity	5%	68%

Hidronefroz-yönetim

Değerlendirilmeli !!!!

- Hidronefroz derecesi
- Unilateral-bilateral
- Üreter
- Renal parankim
- Mesane
- Amnion
- Ürinoma-üriner asit
- Diğer anomaliler

- **Fetal karyotip**

  Ek fetal anomali, anormal tarama testi, ileri anne yaşı varlığında önerilir.

- **Seri ultrason takibi**
  - **Moderate/severe hydronephrosis**
  - **Bilateral tutulum**
  - **Oligohidramnion**
  - **Kalın mesane, üreteromegali, ürinoma**

Hidronefroz-yönetim

Erken doğumun renal sonuçları olumlu etkilediğini gösterilememiştir

Ancak oligohidramniona bağlı kötü gebelik sonuçlarını önlemek için planlanabilir

Unilateral-Bilateral ANH'da erken doğum endikasyonu yoktur

Erken doğum, prematurite ve düşük doğum ağırlığına bağlı riskleri beraberinde getirir

Coplen DE J Urol 1997; 157:2270

Damen Obstet Gynecol 2005; 25:134.

Dilate mesane(Megasist)

- PUV
- Uretral steno-atrezi
- Kloakal disgenezi

Vezikal atoni

- Nörolojik-genetik(MMIH)
- Kromozomal bozukluklar

11-14 hf, fetal mesane ortalama çapı

- <7mm
- 7-15mm: Kr anomali araştır
- >15mm: Obstrüksiyon

Megasistis
4C-A/OB
MI 1.2
Z.T.B. PERINATOLOJI
12428-10-05-03-2
8.3cm / 33Hz
Tis 0.1
03.05.2010 10:11:08
COMP
Routine 1
Har-high
Pwr 100 %
Gn 4
C5 / M5
P2 / E0
6.2 sec

Megasistis
4C-A/OB
MI 1.2
Z.T.B. PERINATOLOJI
12428-08-04-01-2
10.0cm / 29Hz
Tis 0.1
01.04.2008 13:56:04
COMP
Routine
Har-high
Pwr 100
Gn 2
C6 / M5
P4 / E0
7.0 sec

Dev Mes-Gastro
IC 5-9H/OB
MI 1.2
Z.T.B. PERINATOLOJI
12428-11-03-07-1
7.7cm / 20Hz
Tis 0.6
07.03.2011 11:28:44
COMP
1.Trim.Rout.
Har-high
Pwr 100 %
Gn 6
10 sec

DOI: 10.1002/pd.4215

ORIGINAL ARTICLE

Outcome and etiologies of fetal megacystis according to the gestational age at diagnosis

Marie Bornes[1,2], Emmanuel Spaggiari[3,4*], Thomas Schmitz[1,7], Sophie Dreux[5], Isabelle Czerkiewicz[5], Anne-Lise Delezoide[3,7], Alaa El-Ghoneimi[6,7], Jean-François Oury[1,7] and Françoise Muller[5,8]

Table 1 **Diagnosis details of 84 megacystis prenatally diagnosed**

Final diagnosis	Total *n* (%)	TOP/IUFD *n*	Postnatal death *n*	Survival *n*
Total	84	48	3	33
Isolated urologic pathology	47 (55.9)	21	2	24
LUTO	38 (45.2)	21	2	15
Posterior urethral valves	25 (29.7)	9	2	14
Urethral atresia	10 (11.9)	10	0	0
Congenital megalourethra	3 (3.6)	2	0	1
Ureterovesical reflux	9 (10.7)	0	0	9
Congenital abnormalities associated	32 (38.1)	27	1	4
Chromosomal defect	11 (13.1)	11	0	0
Congenital syndrome	15 (17.8)	11	1	3
Urorectal septum malformation	6 (7.1)	5	0	1
Normal bladder	5 (5.9)	0	0	5

TOP, termination of pregnancy; IUFD, intrauterine fetal death; LUTO, lower urinary tract obstruction.
Data are expressed as n (%).

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Ultrasound Obstet. Gynecol. 8 (1996) 387–390

Fetal megacystis at 10–14 weeks of gestation

N. J. Sebire, C. Von Kaisenberg, C. Rubio, R. J. M. Snijders and K. H. Nicolaides

Harris Birthright Research Centre for Fetal Medicine, King's College Hospital Medical School, London, UK

Table 1 Gestation at presentation, crown–rump length (CRL), longitudinal bladder diameter, bladder diameter as a percentage of CRL, fetal nuchal translucency thickness (NT), fetal karyotype, results of 16–20-week anomaly scan and pregnancy outcome in 15 pregnancies complicated by fetal megacystis at 10–14 weeks of gestation

Case	*Gestation* (weeks)	*CRL* (mm)	*Bladder diameter* (mm)	*Bladder diameter/CRL* (%)	*NT* (mm)	*Karyotype*	*Megacystis at 16–20 weeks*	*Outcome*
1	12 + 0	57	10	17.5	3.2	46XY + 21	—	termination 13 weeks
2	11 + 6	55	9	16.4	3.8	46XY + 13	—	termination 12 weeks
3	11 + 0	44	8	18.2	1.3	46XY u14/20	resolved	termination 18 weeks
4	12 + 6	54	8	14.8	1.4	46XY	resolved	live birth 41 weeks
5	10 + 1	45	8	17.8	3.0	46XY	resolved	live birth 38 weeks
6	11 + 6	55	10	18.2	2.2	46XY	resolved	live birth 36 weeks
7	13 + 0	70	9	12.9	1.8	46XY	resolved*	live birth 41 weeks
8	13 + 2	74	10	13.5	3.1	46XY	resolved*	live birth 40 weeks
9	12 + 4	62	11	17.7	3.0	46XY	resolved*	live birth 41 weeks
10	11 + 6	55	12	21.8	2.0	46XY	resolved†	live birth 40 weeks
11	12 + 0	56	10	17.9	1.7	46XY	increased*	termination 16 weeks
12	11 + 5	53	24	45.3	2.0	46XY	increased*	termination 14 weeks
13	12 + 3	61	17	27.9	2.0	46XY	shunting*	miscarriage 15 weeks
14	13 + 0	69	32	46.4	3.0	46XY	shunting*	miscarriage 14 weeks
15	11 + 5	52	21	40.4	1.8	—	—	miscarriage 12 weeks

*, Hydronephrosis; †, hydronephrosis at birth

Ultrasound Obstet Gynecol 2003; **21**: 338–341
Published online in Wiley InterScience (www.interscience.wiley.com). **DOI:** 10.1002/uog.81

Megacystis at 10–14 weeks of gestation: chromosomal defects and outcome according to bladder length

A. W. LIAO, N. J. SEBIRE, L. GEERTS, S. CICERO and K. H. NICOLAIDES

Harris Birthright Research Centre for Fetal Medicine, King's College Hospital Medical School, London, UK

Table 1 Prevalence of chromosomal defects and outcome of fetuses with megacystis according to longitudinal bladder diameter

	Longitudinal bladder diameter (mm)	
	7–15	*> 15*
Total	110	35
Abnormal karyotype	26 (23.6%)	4 (11.4%)
Normal karyotype with follow up	84	30
Spontaneous resolution	71 (89.9%)	0
Obstructive uropathy	8 (10.1%)	30 (100%)

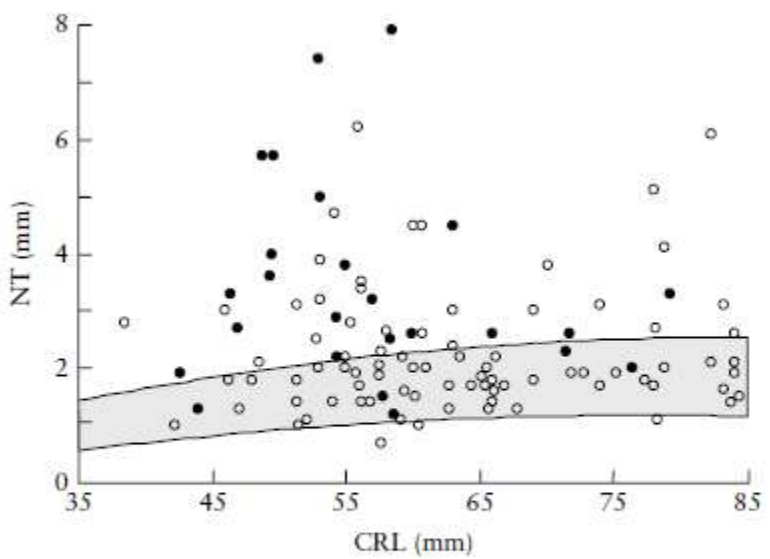
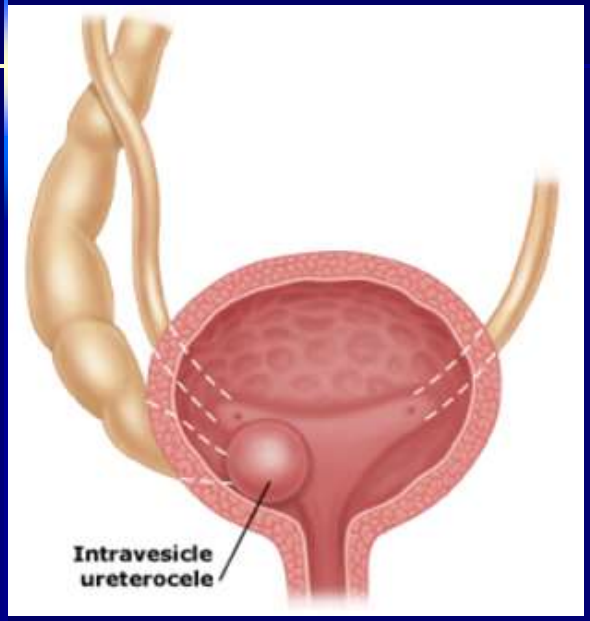


Figure 3 Fetal nuchal translucency (NT) in chromosomally normal (○) and abnormal (●) fetuses with megacystis plotted on the normal range for gestation (5th and 95th centiles). CRL, crown–rump length.

Üreterosel-çift toplayıcı sistem

Üreterosel; distal üreterin intravezikal kistik dilatasyonu



Üst polü drene eden üreter ektopik vezikal orifis ile mesaneye bağlanır

LUTO-Lower urinary tract obstruction
Alt üriner sistem obstrüksiyonu

1/5-7 bin canlı doğumda Erkek fetüslerde sık

Erkeklerde en sık PUV, kızlarda üretral atrezi

Ciddi bilateral VUR ve hidroüreteronefroz

Orta-ciddi mesane distansiyonu

DOI: 10.1111/j.1471-0528.2012.03476.x
www.bjog.org

Congenital lower urinary tract obstruction: a population-based epidemiological study

G Malin,[a,b] AM Tonks,[c] RK Morris,[a,d] J Gardosi,[c] MD Kilby[a,d]

Table 1. LUTO prevalence: quintiles of deprivation

Deprivation IMD 2004	LUTO	Total births	Prevalence (SD)
Quintiles 1–3	92	363 911	2.5 (2.0–3.0)
Quintile 4	70	166 441	4.2 (3.2–5.2)
Quintile 5	122	320 931	3.8 (3.1–4.5)
Quintiles 4–5	192	487 372	3.9 (3.4–4.5)
Not known	0	130	
All areas	63	284	3.3 (2.9–3.7)

Table 3. LUTO subtypes and associated anomalies with total prevalence

LUTO subtype	Total	%LUTO	Prevalence (SD)
Posterior urethral valves	179	63.0	2.10 (1.79–2.41)
Urethral atresia	28	9.9	0.33 (0.21–0.45)
Urethral stenosis	20	7.0	0.23 (0.13–0.34)
Prune belly syndrome	7	2.5	0.08 (0.02–0.14)
LUTO unspecified/specified other	50	17.6	0.59 (0.42–0.75)
Total LUTO cases	284	100.0	3.34 (2.95–3.72)

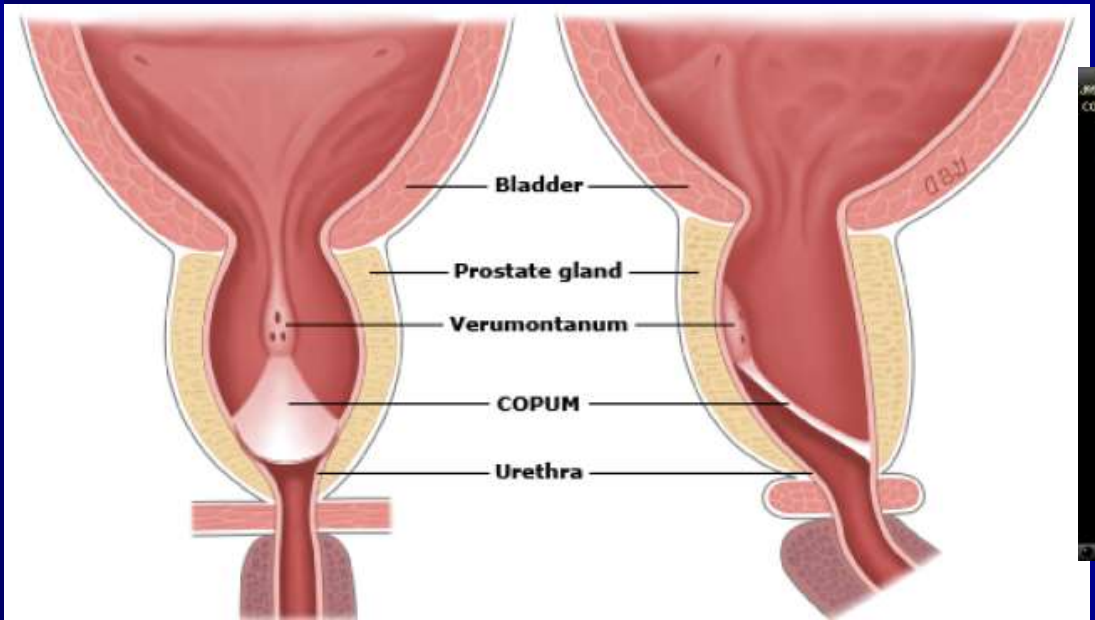
Table 4. LUTO: pregnancy outcome

Pregnancy outcome	Complex, *n* (%)	Isolated, *n* (%)	Total, *n* (%)
Termination of pregnancy	26 (41.3)	44 (19.9)	70 (24.6)
Spontaneous fetal loss	5 (7.9)	8 (3.6)	13 (4.6)
Spontaneous stillbirths	8 (12.7)	3 (1.4)	11 (3.9)
Infant death*	11 (17.5)	20 (9.0)	31 (10.9)
Alive at 1 year	13 (20.6)	146 (66.1)	159 (56.0)
Total cases	63 (100.0)	221 (100.0)	284 (100.0%)

*Includes early and late neonatal death.

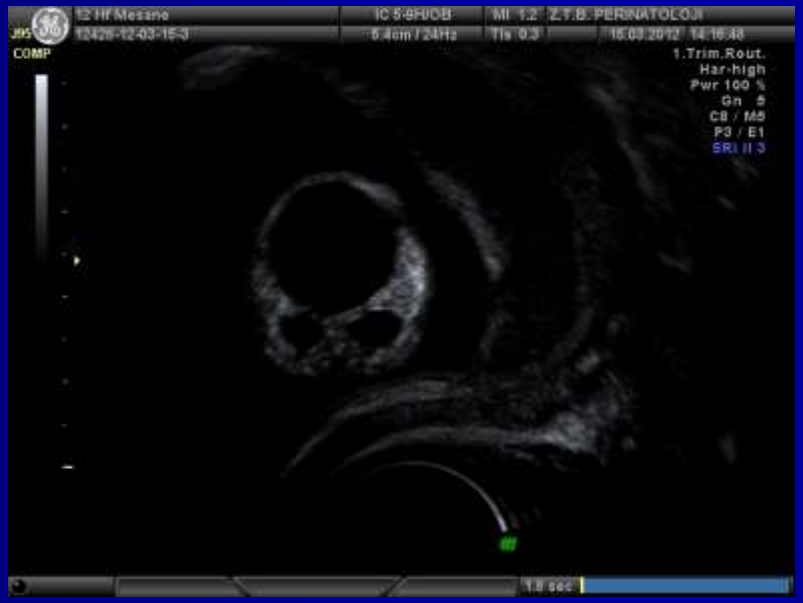
Posterior üretral valve

- İnsidans 1/5000
- Posterior üretrada membran
- Çocuklukta ağır obstruktif üropatinin EN SIK nedeni
- Yalnız erkekler



PUV

- Dilate üretra, distandü ve kalın duvarlı mesane, dilate üreterler ve bilateral hidronefroz
- %43 diğer anomalilerle birliktelik



PUV

2. trimesterde oligohidramnion tespit edilen olgularda perinatal mortalite %90-95 gibi yüksek oranda olabilir

Freedman AL Pediatr Nephrol 2000; 14:167.

PUV-Uzun dönem sonuçlar

Kronik böbrek hast.

Prenatal tespit edilen PUV olgularının %60'ında renal displazi ile birlikte parankim değişiklikleri izlenir.

Olguların %15-20'si end-stage böbrek yetmezliğine gider.

PUV-Uzun dönem sonuçlar

Vezikoüreteral reflü

Olguların 1/3-1/2'sinde VUR görülür

1953-2003 # 197 PUV (99 olgu postnatal tanı)		
VUR		**Without-VUR**
127 (%64)		**70(%35)**
Bilateral	**Unilateral**	
73(%37)	54	
Postnatal 6-12. ayda serum kreatin düzeyleri daha yüksek		
16 yaş öncesi ESRD insidansı		
%25	**%7**	**%4**

Heikkilä J J Urol 2009; 182:1555.

PUV-Uzun dönem sonuçlar

Mesane disfonksiyonu

Olguların 1/3'ünde kalıcı mesane disfonksiyonu görülür

- Farmakolojik tedavi
- Clear intermittent catheterization(CIC)

CIC uygulaması yapılanlarda ESRD riski artar

Yönetim

- Ekspektan yaklaşım
- Gebelik terminasyonu
- Vezikosentez
- **Veziko-amniotik shunt**

Yönetim

- Ekstra-renal major anomali taraması
- Fetal karyotip
- Fetal böbrek fonksiyonu
  - USG
  - Fetal idrar-serum parametreleri

Congenital Anomalies

THE JAPANESE TERATOLOGY SOCIETY

doi:10.1111/cga.12007

Congenital Anomalies 2013; 53, 89–91

SHORT COMMUNICATION

Prenatal cytogenetic diagnosis from fetal urine in lower urinary tract obstruction

Sina Haeri[1], Simone Hernandez Ruano[2], Leila M. S. Farah[3], Raquel Loffe[4], and Rodrigo Ruano[1,2]

Case no.	Gestational age (weeks)	Amniotic fluid karyotype Diagnosis	Fetal urine karyotype Diagnosis	Final anatomic cause of LUTO
1	15	Trisomy 13	Trisomy 13	PUV
2	15	Partial deletion 4p	Partial deletion 4p	PUV
3	15	Normal	Normal	PBS
4	18	Trisomy 21	Trisomy 21	PUV
5	20	Normal	Normal	UA
6	21	Normal	Normal	PUV
7	21	Trisomy 21	Trisomy 21	UA
8	23	Normal	Normal	MU
9	23	Normal	Normal	PUV
10	24	Normal	Normal	PUV
11	25	Normal	Normal	PBS

Fetal idrar parametreleri

Sodium	≤100 mmol/L
Osmolality	≤200 mOsm/L
Chloride	≤90 mmol/L
Calcium	≤8 mg/dl
Total protein	≤40 mg/dl
B-2 microglobulin	≤6 mg/L

572 olguluk bir sistematik derlemede **hiçbir parametrenin postnatal kötü böbrek fonksiyonunu öngörmede klinik olarak anlamlı doğruluğunun olmadığı** belirtilmiştir.

Morris RK Prenat Diagn 2007; 27:900.

Fetal Serum β2-Microglobulin Before and After Bladder Shunting: A 2-Step Approach to Evaluate Fetuses With Lower Urinary Tract Obstruction

Vol. 178, 2576-2579, December 2007
Printed in U.S.A.
DOI:10.1016/j.juro.2007.08.052

Frank J. Craparo, Mariangela Rustico, Beatrice Tassis, Dario Coviello and Umberto Nicolini*
From the Department of Obstetrics and Gynecology, Ospedale V. Buzzi, University of Milan, Milan, Italy

TABLE 1. *Prenatal findings and postnatal outcome in 12 fetuses with lower urinary tract obstruction treated with vesicoamniotic shunting*

Case No.	Gestational Age at Shunting (wks)	Urinary Na^+ (mEq/l)	Urinary β2-Microglobulin (mg/l)	Serum β2-Microglobulin (mg/l)		Amniotic Fluid Vol After Shunting	Gestational Age at Delivery (wks)	Outcome
				Before Shunting	After Shunting			
1	20	121	15	6.7	11.6	Persistent oligohydramnios	23	Pregnancy terminated due to renal dysplasia
2	21	76	7	5.7	8.7	Persistent oligohydramnios	23	Pregnancy terminated due to renal dysplasia
3	22	110	29	8.1	5.6	Normal until delivery	39	Normal renal function at 5 yrs
4	20	72	10	5.4	5.7	Normal until 31 wks, oligohydramnios thereafter	38	Renal failure at 3 yrs, awaiting renal transplant
5	21	77	7	4.1	4.9	Normal until delivery	33	Renal failure at 3 yrs, awaiting renal transplant
6	20	93	4	4.4	5.3	Normal until 31 wks, oligohydramnios thereafter	36	Renal transplant at 2 yrs
7	25	75	—	7.0	9.2	Normal until 29 wks, oligohydramnios thereafter	36	Renal failure at 3 yrs, awaiting renal transplant
8	28	81	4	9.2	3.6	Normal until 34 wks, oligohydramnios thereafter	37	Normal renal function at 18 mos
9	30	53	3	3.6	3.6	Normal until delivery	38	Normal renal function at 18 mos
10	29	105	31	8.8	6.9	Normal until delivery	38	Renal failure at 1 yr
11	18	98	10	6.8	4.8	Normal until 31 wks, oligohydramnios thereafter	37	Renal failure at 4 mos
12	24	75	20	7.2	5.7	Normal until delivery	38	Normal renal function at 3 mos

İntrauterin cerrahi
Veziko-amniotik shunt

Harrison fetal bladder stent set

Birçok prospektif ve retrospektif çalışma yapılmasına rağmen işlemin renal sonuçları iyileştirdiğine dair iyi kanıtlar yok

Vakaların yaklaşık 1/2'sinde kronik renal yetmezliğe bağlı transplant ihtiyacı vardır

Bu presedürler amnionu atrırarak potansiyel akciğer gelişimini sağlayabilirler

VA shunt vs. Ekspektan

- **Perinatal sağkalım OR 2.53**
  - **# 23/21 %91**
  - **# 8/6 %75**
  - **# 15/8 %53**

Clark TJ et al. (2003) *Obst&Gyn 102: 367-382.*

Biard JM, et al. (2005) *Obst&Gyn106: 503-508.*

McLorie Get al. (2001) *J of Urol166: 1036-1040.*

Uzun dönem takip

- **Dializ/Transplantasyon**
  - **# 18/6 %33**
  - **# 8/2 %25**
  - **# 6/2 %33**

Biard JM, et al. (2005) *Obst&Gyn106: 503-508.*

McLorie G,et al. (2001) *J of Urol166: 1036-1040.*

İlk aylarda dializ gerekenlerin %80'i transplantasyon öncesi ölür

- **Respiratuar fonksiyon**
  - **Astım #18/7 %39**
  - **Rekürren pulm enf #18/5 %28**
  - Normal pulm fonk #18/10 %55

Johnson MP,et al. (1994) *Am J of Obst & Gyn 170: 1770-1776.*

Journal of Pediatric Surgery (2013) 48, 956–962

ELSEVIER

Journal of Pediatric Surgery

www.elsevier.com/locate/jpedsurg

Outcomes of fetuses with lower urinary tract obstruction treated with vesicoamniotic shunt: A single-institution experience

Cecilia G. Ethun[a], Irving J. Zamora[a,b], David R. Roth[c], Arundhati Kale[c], Lars Cisek[d],

Table 1 Complications after vesicoamniotic

	No. (%), $n=16$	Pts (%), $n=10$
Shunt complications	12 (75)	7 (70)
Dislodgement	8 (50)	4 (40)
Unsuccessful placement	3 (19)	2 (20)
Occlusion	1 (6)	1 (10)
Maternal–fetal complications	4 (25)	4 (40)

2 iu-1 neonatal ex

7/10 sağkalım

6/7 0rtalama 3.7 yıl takip

- 6/6 GUS morbiditesi
- 5/6 KBY-1/5 transplant
- 3/6 Resp. Yetm.

Does fetal bladder drainage have a role? *BJOG. 2007*

DOI: 10.1111/j.1471-0528.2007.01382.x
www.blackwellpublishing.com/bjog

Protocol

PLUTO trial protocol: percutaneous shunting for lower urinary tract obstruction randomised controlled trial*

The Pluto Collaborative Study Group

Correspondence: Prof Kilby, Division of Reproductive and Child Health, Birmingham Women's Hospital, University of Birmingham, Birmingham B15 2TG, UK. Email m.d.kilby@bham.ac.uk

- Pluto Collaborative Study Group
- A multicentre RCT
- September 2010
- Follow up at 5 years

Percutaneous vesicoamniotic shunting versus conservative management for fetal lower urinary tract obstruction (PLUTO): a randomised trial

Lancet 2013; 382: 1496–506

Rachel K Morris, Gemma L Malin, Elisabeth Quinlan-Jones, Lee J Middleton, Karla Hemming, Danielle Burke, Jane P Daniels, Khalid S Khan, Jon Deeks, Mark D Kilby, for the Percutaneous vesicoamniotic shunting in Lower Urinary Tract Obstruction (PLUTO) Collaborative Group

VAS n:16			Control n:15			
Livebirth	iuex	termination	Livebirth	iuex	termination	
12	1	3	12	1	2	
Postnatal 28 days survival			Postnatal 28 days survival			
8			4			P:0.03
Procedure complication						
6 (4 pregnancy losses)						

The study closed early because of poor recruitment.

(PLUTO): a randomised trial.

Lancet 2013

VAS16/8 infants → 2 normal renal function

Cont 15/4 infants - none

- **There was substantial short-term and long-term morbidity in both groups**

Our results suggest that the chance of newborn babies surviving with normal renal function is very low irrespective of whether or not vesicoamniotic shunting is done.

Komplikasyonlar

Shunt dislokasyonu(%25-40)

Tıkanıklık (%25-60)

Geçici VP fistül

Üriner asit

TEŞEKKÜRLER…