Hydronefróza?

- terminologie a poznámky pohledu urologa

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Terminologie

Termín HYDRONEFRÓZA

- Neonatolog, pediatr, nefrolog:
  symptom = dilatace kalichů a pánvičky +/- dilatace ureteru

- Urolog:
  diagnóza - kongenitální hydronefróza,
  tzn. obstrukce PUJ bez dilatace ureteru

- Radiolog: Dilatace KPS + močovodu na UZ a na MCUG…

Terminologie

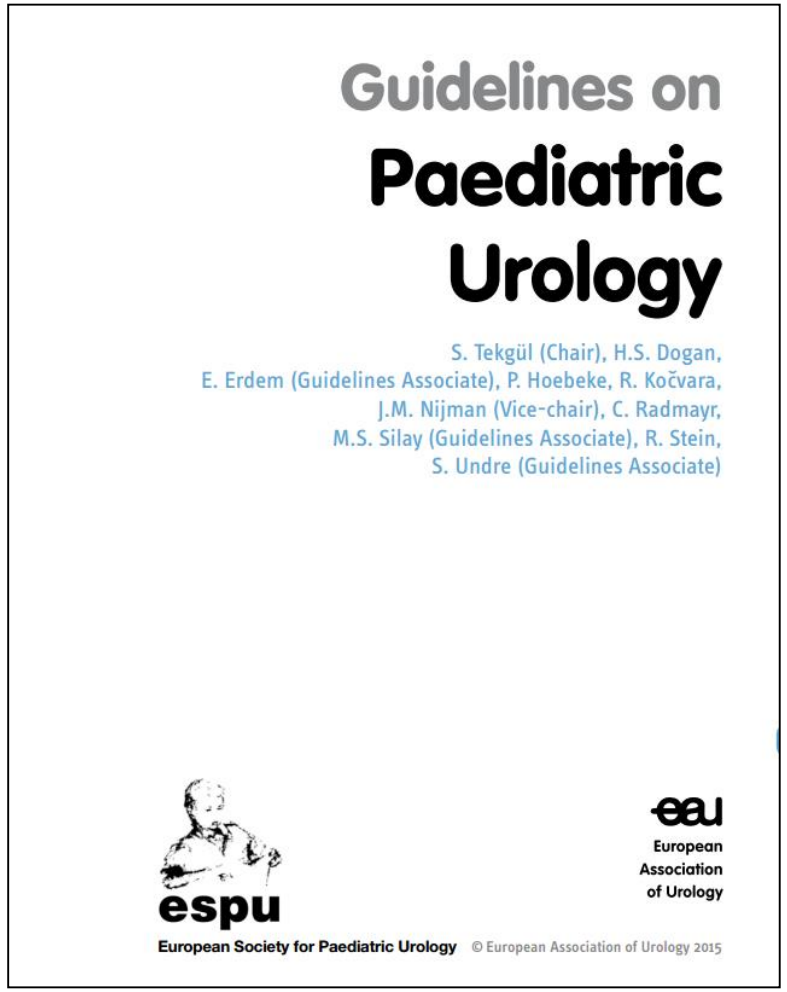
Doporučení ESPR 2017 + americké odborné společnosti 2014 (UTD):

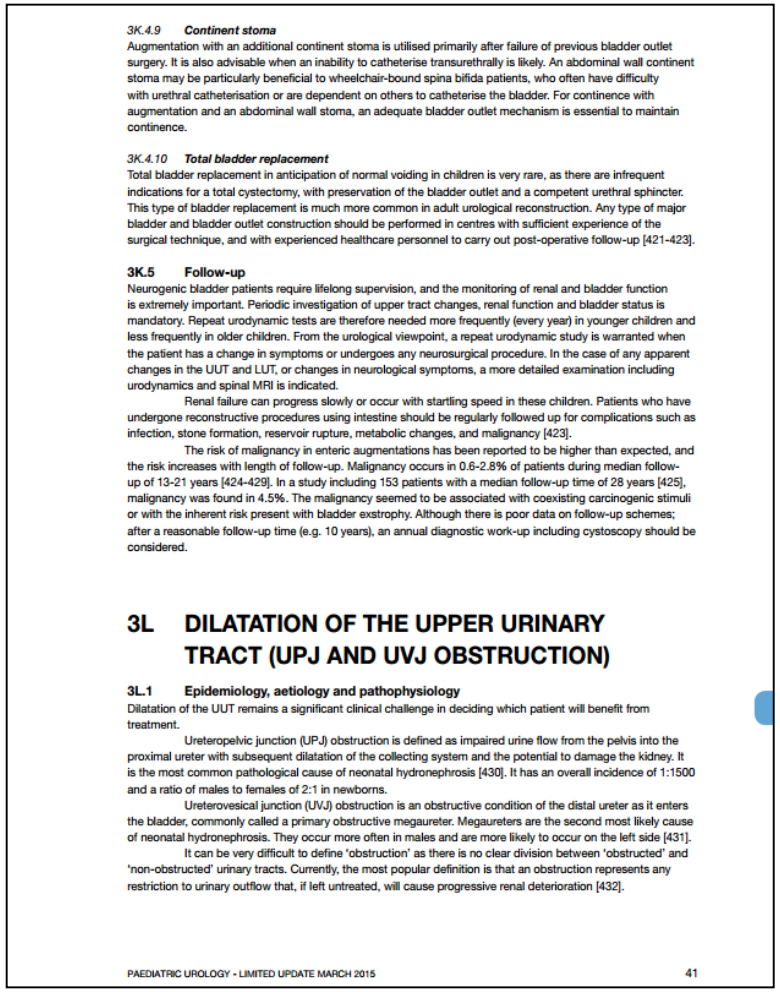
Popisný termín symptomu „hydronefróza“, „pyelektázie“, „hypotonie“ apod. nahradit jednotným termínem **dilatace močových cest** (urinary tract dilatation) a to:

- **Dilatace KP** (pelvicalyceal dilatation) – na základě dg PUJO, litiázy, tumoru, traumatu
- **Dilatace HMC** (upper urinary tract dilatation) – na základě dg VUR (primárního nebo sekundárního), VUJO (čili primárního obstrukčního megaureteru), litiázy, tumoru
- **Dilatace DMC** (lower urinary tract dilatation) – na základě dg CHZU, striktury uretry, syringokély, chlopně přední uretry, uretrokély aj.

Terminologie

ESPU (European Society of Paediatric Urology) 2015:





3K.4.9 ***Continent stoma***

Augmentation with an additional continent stoma is utilised primarily after failure of previous bladder outlet surgery. It is also advisable when an inability to catheterise transurethrally is likely. An abdominal wall continent stoma may be particularly beneficial to wheelchair-bound spina bifida patients, who often have difficulty with urethral catheterisation or are dependent on others to catheterise the bladder. For continence with augmentation and an abdominal wall stoma, an adequate bladder outlet mechanism is essential to maintain continence.

3K.4.10 ***Total bladder replacement***

Total bladder replacement in anticipation of normal voiding in children is very rare, as there are infrequent indications for a total cystectomy, with preservation of the bladder outlet and a competent urethral sphincter. This type of bladder replacement is much more common in adult urological reconstruction. Any type of major bladder and bladder outlet construction should be performed in centres with sufficient experience of the surgical technique, and with experienced healthcare personnel to carry out post-operative follow-up [421-423].

3K.5 Follow-up

Neurogenic bladder patients require lifelong supervision, and the monitoring of renal and bladder function is extremely important. Periodic investigation of upper tract changes, renal function and bladder status is mandatory. Repeat urodynamic tests are therefore needed more frequently (every year) in younger children and less frequently in older children. From the urological viewpoint, a repeat urodynamic study is warranted when the patient has a change in symptoms or undergoes any neurosurgical procedure. In the case of any apparent changes in the UUT and LUT, or changes in neurological symptoms, a more detailed examination including urodynamics and spinal MRI is indicated.

Renal failure can progress slowly or occur with startling speed in these children. Patients who have undergone reconstructive procedures using intestine should be regularly followed up for complications such as infection, stone formation, reservoir rupture, metabolic changes, and malignancy [423].

The risk of malignancy in enteric augmentations has been reported to be higher than expected, and the risk increases with length of follow-up. Malignancy occurs in 0.6-2.8% of patients during median follow-up of 13-21 years [424-429]. In a study including 153 patients with a median follow-up time of 28 years [425], malignancy was found in 4.5%. The malignancy seemed to be associated with coexisting carcinogenic stimuli or with the inherent risk present with bladder exstrophy. Although there is poor data on follow-up schemes; after a reasonable follow-up time (e.g. 10 years), an annual diagnostic work-up including cystoscopy should be considered.

3L DILATATION OF THE UPPER URINARY TRACT (UPJ AND UVJ OBSTRUCTION)

3L.1 Epidemiology, aetiology and pathophysiology

Dilatation of the UUT remains a significant clinical challenge in deciding which patient will benefit from treatment.

Ureteropelvic junction (UPJ) obstruction is defined as impaired urine flow from the pelvis into the proximal ureter with subsequent dilatation of the collecting system and the potential to damage the kidney. It is the most common pathological cause of neonatal hydronephrosis [430]. It has an overall incidence of 1:1500 and a ratio of males to females of 2:1 in newborns.

Ureterovesical junction (UVJ) obstruction is an obstructive condition of the distal ureter as it enters the bladder, commonly called a primary obstructive megaureter. Megaureters are the second most likely cause of neonatal hydronephrosis. They occur more often in males and are more likely to occur on the left side [431].

It can be very difficult to define 'obstruction' as there is no clear division between 'obstructed' and 'non-obstructed' urinary tracts. Currently, the most popular definition is that an obstruction represents any restriction to urinary outflow that, if left untreated, will cause progressive renal deterioration [432].

Cíl sdělení

- Algoritmus vyšetřování a sledování dětí s dilatací HMC

Dilatace HMC – co se změnilo?

- Do 80tých let, kdy **zaváděn UZ** do klinické praxe, léčeni pouze symptomatičtí pacienti (IMC, hematurie, bolesti, litiáza, retence moči)
- Se zavedením UZ nově dg. prenatální i postnatální dilatace HMC asymptomatických pacientů – **které operovat?** Všechny??
- ESPU: pouze ty, u nichž dilatace HMC může vést ke **zhoršení funkce** ledviny (nebo ledvin) – pouze **cca 20% pacientů s dilatací HMC**
- Vyšší stupeň dilatace HMC = vyšší riziko zhoršení funkce a operace – stupeň dilatace hydronefrózy dle SFU a AP, event. UDT

Prenatální dilatace HMC – diferenciální diagnóza

Table 1 Etiology of urinary tract dilation detected on antenatal ultrasound.

Etiology	Incidence (%)
Transient/physiologic	50–70
Ureteropelvic junction obstruction	10–30
Vesicoureteral reflux	10–40
Ureterovesical junction obstruction/megaureter	5–15
Multicystic dysplastic kidney disease	2–5
Posterior urethral valves	1–5
Ureterocele, ectopic ureter, duplex system, urethral atresia, Prune belly syndrome, polycystic kidney diseases, l cysts	Uncommon

Adapted from Nguyen et al. 2010 [16].

Prenatální dilatace KP

Pelvis dilatation	Second trimester APD in mm	Third trimester APD in mm
Mild	4-7	7-9
Moderate	7-10	9-15
Severe	> 10	> 15

Sharma G et al. Management of antenatal hydronephrosis, 2014

Postnatální hydronefróza při PUJO a riziko operace

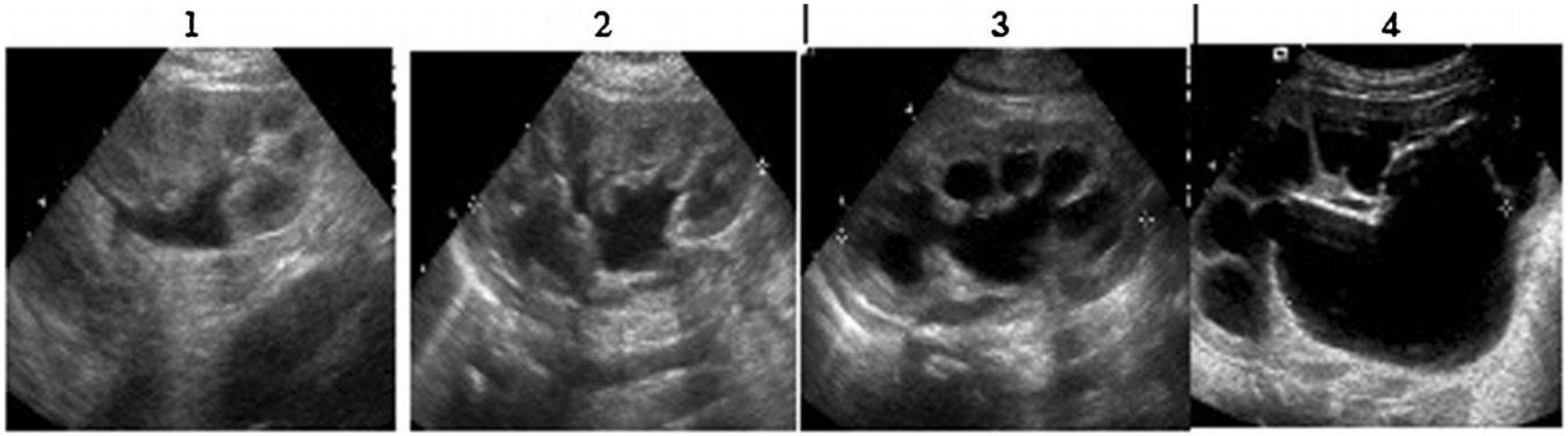


Fig. 1 Ultrasound appearance of hydronephrosis by Society for Fetal Urology (SFU) classification

	Mírná dilatace KP	Střední dilatace KP	Závažná dilatace KP
SFU	stupeň 1 a 2	Stupeň 3	Stupeň 4
AP	< 20 mm	20-30 mm	> 30 mm
Riziko operace*	< 10%	40%	> 90%

*__Dhillon HK__. Prenatally diagnosed hydronephrosis: the Great Ormond Street experience. *Br J Urol* 1998

Stupně prenatální a postnatální dilatace HMC 2014

Journal of Pediatric Urology (2014) 10, 982–999

ELSEVIER

Journal of Pediatric urology

Multidisciplinary consensus on the classification of prenatal and postnatal urinary tract dilation (UTD classification system)

Hiep T. Nguyen [d,f,*], Carol B. Benson [h,a], Bryann Bromley [b], Jeffrey B. Campbell [d,f], Jeanne Chow [g], Beverly Coleman [a,h], Christopher Cooper [d,f], Jude Crino [e], Kassa Darge [g], C.D. Anthony Herndon [d,f], Anthony O. Odibo [e], Michael J.G. Somers [c], Deborah R. Stein [c]

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[h] *Society of Radiologists in Ultrasounds (SRU), Reston, VA, USA*

Postnatální vyšetření dilatace HMC - UZ

Postnatální **UZ minimálně 48 hod po porodu**

Kromě prenatálního nálezu:

- solitární ledviny
- SFU gr IV dilatace KP
- bilaterální dilatace HMC
- oligohydramnion v anamnéze

Pediatr Radiol (2008) 38:138–145
DOI 10.1007/s00247-007-0695-7

REVIEW

Imaging recommendations in paediatric uroradiology: minutes of the ESPR workgroup session on urinary tract infection, fetal hydronephrosis, urinary tract ultrasonography and voiding cystourethrography, Barcelona, Spain, June 2007

Michael Riccabona · Fred E. Avni · Johan G. Blickman · Jean-Nicolas Dacher · Kassa Darge · M. Luisa Lobo · Ulrich Willi

Received: 1 October 2007 / Accepted: 22 October 2007 / Published online: 11 December 2007

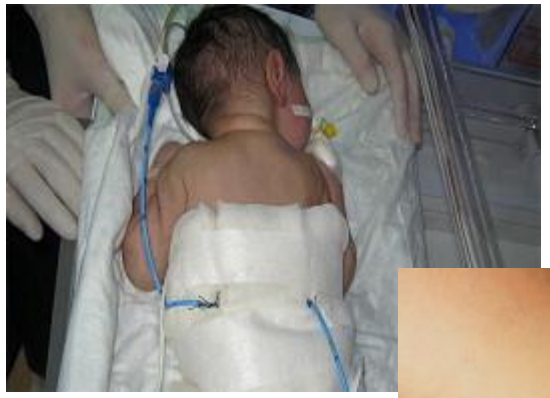
Algoritmus postnatálního vyšetření dilatace HMC

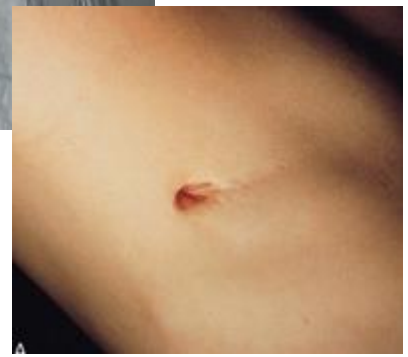
- **Jednostranná dilatace HMC:** UZ a MCUG po narození + MAG3 v 6 týdnech věku
- **Oboustranná dilatace HMC:** UZ a MCUG po narození + MAG3 v 4 až 6 týdnech věku + kreatinin týdně
- Zvážení derivace močových cest; ATB profylaxe jen u dilatace ureteru, ne u KP

Terapie dilatace HMC

Akutní operace u vážných stavů (extrémní dilatace HMC jedno nebo oboustranná) **= derivace močových cest:**

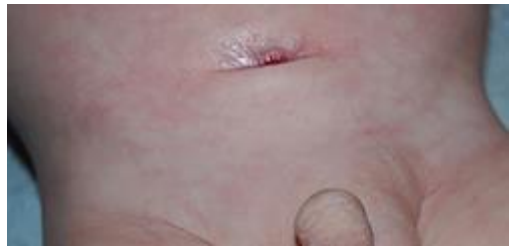
- Nefrostomie
- Ureterostomie
- Epicystostomie nebo vezikostomie





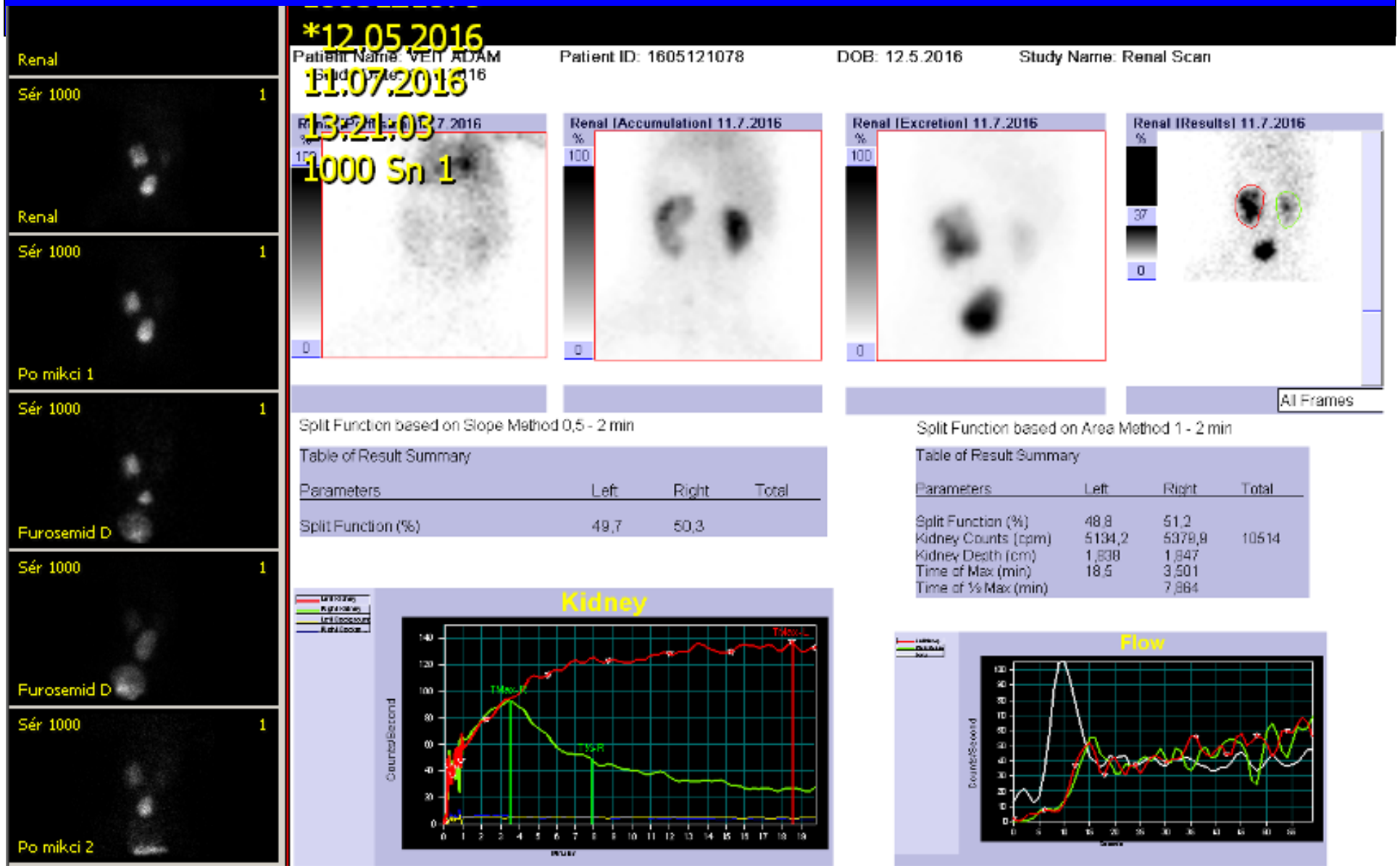
+ definitivní řešení po 6. měsíci věku:

- Pyeloplastika
- Cystoskopická aplikace Urodexu u VUR
- Reimplantace močovodu



Výjimka: časná pyeloplastika ve 4. až 6. týdnu

MAG3 – dynamická scintigrafie ledvin



Terapie dilatace HMC

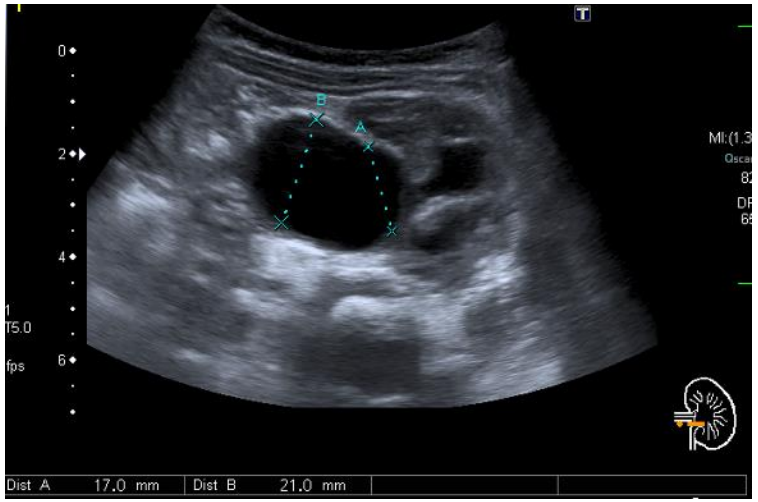
Operace - pyeloplastika - indikována při:

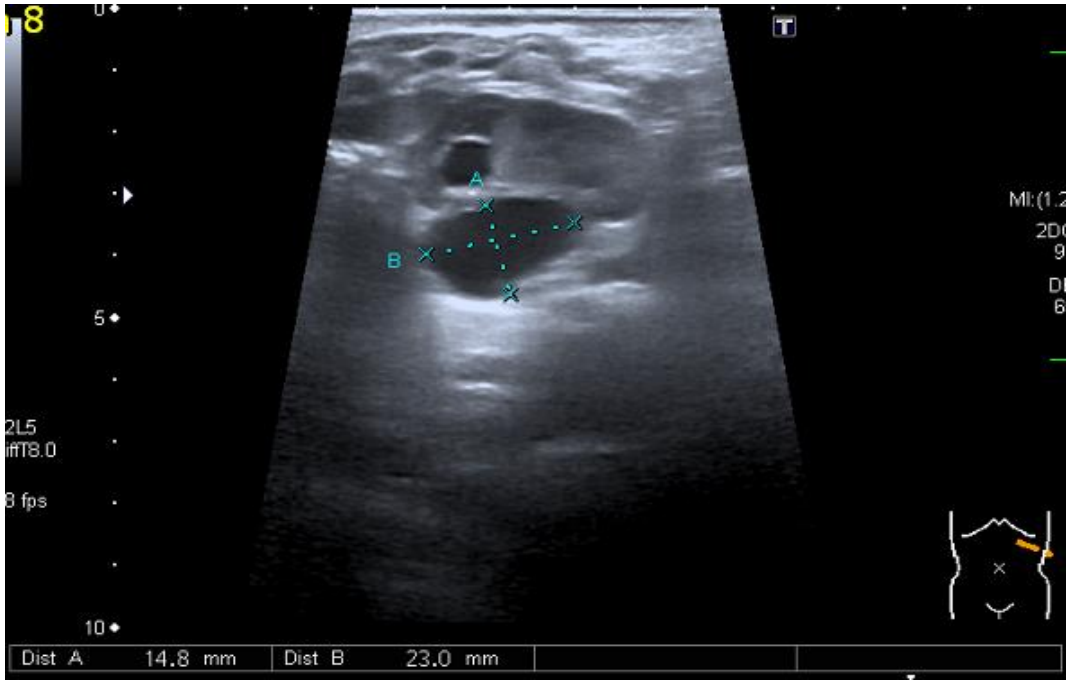
- MAG3 funkci pod 40% nebo poklesu funkce o 10% a více na kontrolním MAG3
- Jasná DSL obstrukční křivka nereagující na vertikalizaci a furosemid
- AP nad 30mm nebo progresi AP rozměru na kontrolním UZ
  - CAVE! měření ve stejné poloze a se zobrazením náplně MM

Pooperační sledování dilatace HMC

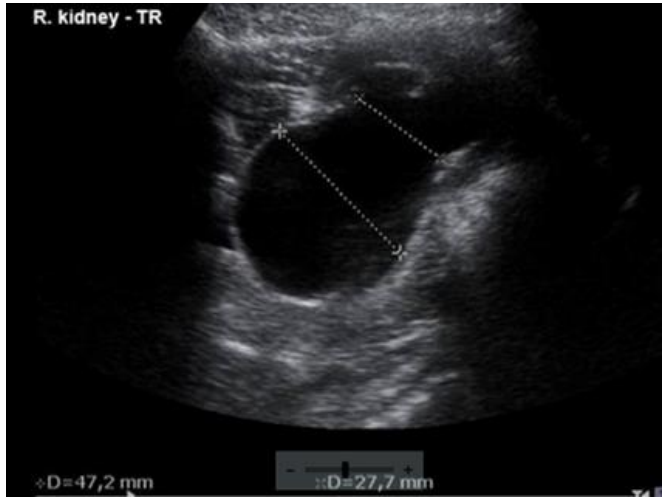
- **Hlavním nástrojem je UZ a jeho pečlivé a standardizované provedení!**
- Vždy MM a jeho objem, ideálně zopakovat UZ i po mikci s PMR

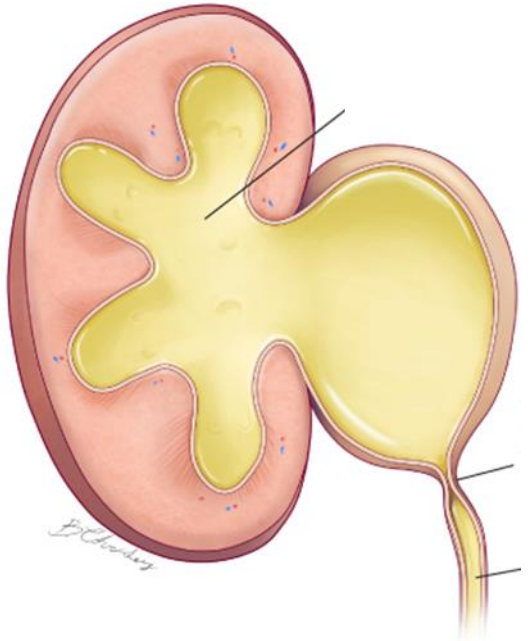
- **Dilatace HMC – jak ureteru, tak KP se po operaci významně nemění –** operace zabrání zhoršení funkce ledviny/ ledvin.

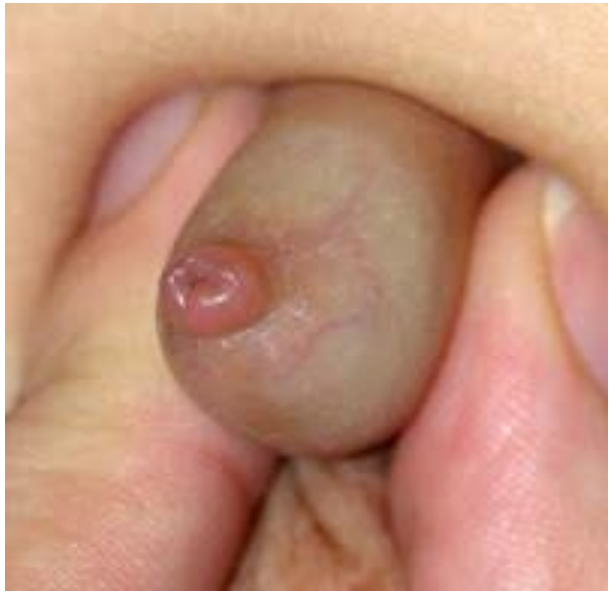


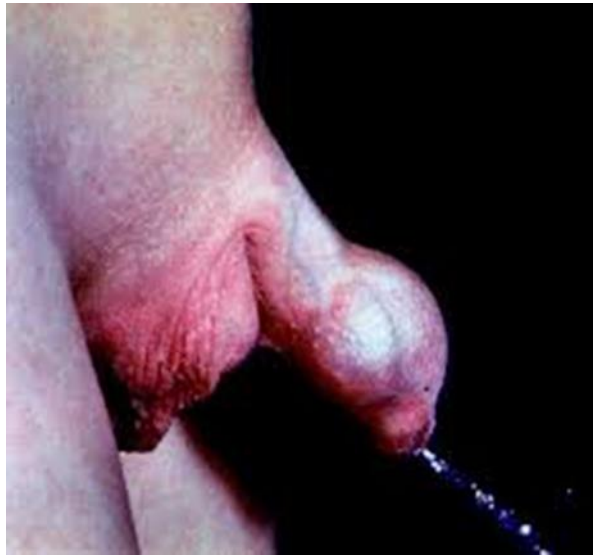


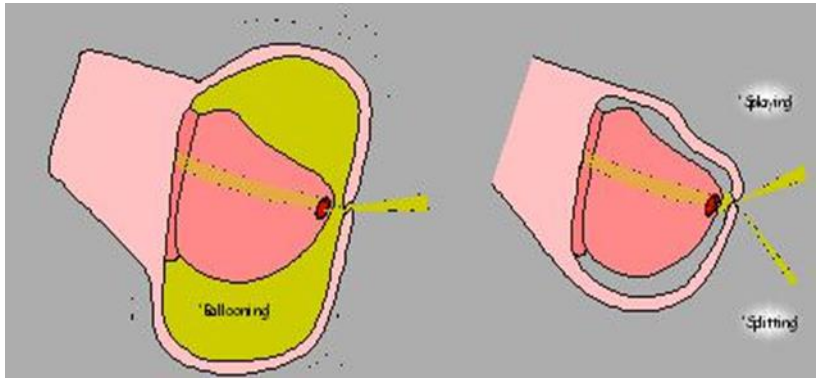
UZ měření dilatace extrarenální pánvičky











Závěr a diskuze

- 80% kongenitálních dilatací HMC nevyžaduje operaci
- K identifikování 20% dětí s dilatací HMC, kteří potřebují operaci, je třeba opakované vyšetřování před i po operaci – pečlivé a komplexní UZ vyšetření
- Výhled do budoucna - funkční MRU má potenciál nahradit v jednom UZ, DSL a MCUG