Vesico-Ureteral Reflux: AUA – EAU Guidelines

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INTRODUCTION

What is VUR?

What is PRIMARY VUR?

What is SECONDARY VUR?

Why is VUR IMPORTANT?

Why is VUR CHALLENGING?
What is VUR?
What is VUR?

Grades of Reflux:

- I: Low grade, non dilating
- II: Low grade, dilating
- III: High grade, dilating
- IV: High grade, dilating

What is VUR?
Absence of

- increased bladder pressure
- Ureteral
- Bladder
- Urethral anomalies.

**What is a PRIMARY VUR?**
What is a SECONDARY VUR?
3 % children: UTI each year

UTI: MOST COMMON bacterial disease during the FIRST 3 MONTHS

30 % of children with UTI HAVE VUR.

~1-2 % of children have VUR.

Prevalence of VUR ≈ 1/AGE

Some VUR patients develop CHRONIC KIDNEY DAMAGE.
  – 5-10% of Pediatric ESRD is due to Reflux Nephropathy

Why is VUR important?
Reflux ➔ Infection ➔ Scar formation

Why is VUR important?
Why is VUR challenging?
Hidden high-grade vesicoureteral reflux is the main risk factor for chronic renal damage in children under the age of two years with first urinary tract infection.

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TREATMENT

GUIDELINES : SO WHAT ?

CONCLUSIONS
GOALS?

Treatment VS no treatment?

NO TREATMENT?

TREATMENT? Endoscopic?
VUR \( \Rightarrow \) UTI + Scar formation, goals of VUR treatment:

1. Prevent KIDNEY INFECTIONS
2. Prevent SCAR FORMATION

Goals of treatment?
Low VUR grades: spontaneous resolution

➔ Need to pick those refluxes which will not evolve spontaneously

Treatment VS no Treatment?
Treatment VS no Treatment?
Treatment VS no Treatment?
Antibiotic prophylaxis until resolution acquired

Urinary prophylaxis

Nitrofurantoine 2 mg/kg
Trimethoprim 2 mg/kg
(Norfloxacine 2 mg/kg)

Cystography control

No treatment?
Treatment?
Treatment ?
VUR: To treat or not to treat?
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GUIDELINES

AUA

EAU

NICE
VESICOURETERAL REFLUX

TOPIC 1 – MANAGEMENT OF VESICOURETERAL REFLUX IN THE CHILD OVER ONE YEAR OF AGE

Index patient
The 4-year old patient with vesicoureteral reflux (VUR) and no clinical evidence of bladder/bowel dysfunction (BBD) who has presented initially with a febrile urinary tract infection (UTI) and a subsequent diagnosis of VUR by cystography.

TOPIC 2 – MANAGEMENT OF INFANTS LESS THAN ONE YEAR OF AGE WITH VESICOURETERAL REFLUX

Index patient
The infant less than one year of age who is diagnosed with primary vesicoureteral reflux (VUR) during the early postnatal period based on a diagnosis of prenatal hydronephrosis (PNH) or following the occurrence of a urinary tract infection (UTI).

TOPIC 3 – MANAGEMENT OF CHILDREN WITH VESICOURETERAL REFLUX AND BLADDER/BOWEL DYSFUNCTION

Index patient
The 4-year-old child with vesicoureteral reflux (VUR) and evidence of clinical bladder/bowel dysfunction (BBD) without evidence of an overt neurological cause.

TOPIC 4 – SCREENING OF SIBLINGS AND OFFSPRING OF PATIENTS WITH VESICOURETERAL REFLUX

Index Patient
The sibling of a child with vesicoureteral reflux (VUR).

TOPIC 5 – SCREENING OF THE NEONATE/INFANT WITH PRENATAL HYDRONEPHROSIS

Index patient
The healthy neonate with unilateral mild (Society for Fetal Urology [SFU] grade 1) to moderate (SFU grades 2–3) hydronephrosis identified on a screening prenatal ultrasound at 30 weeks gestation.
“Treatment options include observation, continuous antibiotic prophylaxis (CAP), and interventions of curative intent”.

“If there is indeed a lack of preventative benefit with CAP for acute pyelonephritis and renal injury in children with VUR, one may question the value of treating, or even diagnosing, VUR”.

“An association between VUR and renal injury was demonstrated”
Hidden high-grade vesicoureteral reflux is the main risk factor for chronic renal damage in children under the age of two years with first urinary tract infection.

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Figure 6: Algorithm for the management of a first febrile UTI

First febrile UTI

Ultrasound upper and lower urinary tract

No pathological findings

Boys > 12 months

Imaging after recurrent infections

Toilet trained children: exclusion of BBD

Infant/girl

Exclusion of reflux/VCUG/DMSA

Suspicion of VUR and/or pyelonephritis

Upper tract dilatation/hydronephrosis

Complicated UTI/close monitoring i.v. antibiotic treatment

Good response

Further evaluation of upper tract function (renal scan/MRI) Exclusion of VUR (VCUG)

Critical clinical status or no response

Consider transient urinary diversion
### Table 10: Management and follow-up according to different risk groups

<table>
<thead>
<tr>
<th>Risk Groups</th>
<th>Presentation</th>
<th>Initial treatment</th>
<th>Comment</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Symptomatic male or female patients after toilet-training with high-grade reflux (grades IV-V), abnormal kidneys and LUTD</td>
<td>Initial treatment is always for LUTD with CAP; intervention may be considered in cases of BT infections or persistent reflux</td>
<td>Greater possibility of earlier intervention</td>
<td>More aggressive follow-up for UTI and LUTD; full re-evaluation after 6 months</td>
</tr>
<tr>
<td>High</td>
<td>Symptomatic male or female patients after toilet-training with high-grade reflux (grade IV-V), abnormal kidneys and no LUTD</td>
<td>Intervention should be considered</td>
<td>Open surgery has better results than endoscopic surgery</td>
<td>Post-operative VCUG on indication only; follow-up of kidney status until after puberty</td>
</tr>
<tr>
<td>Moderate</td>
<td>Symptomatic male or female patients before toilet-training, with high-grade reflux and abnormal kidneys</td>
<td>CAP is the initial treatment. Intervention may be considered in cases of BT infections or persistent reflux</td>
<td>Spontaneous resolution is higher in males</td>
<td>Follow-up for UTI/hydronephrosis; full re-evaluation after 12-24 months</td>
</tr>
<tr>
<td>Moderate</td>
<td>Asymptomatic patients (PNH or sibling) with high-grade reflux and abnormal kidneys</td>
<td>CAP is the initial treatment. Intervention may be considered in cases of BT, infections or persistent reflux</td>
<td></td>
<td>Follow-up for UTI/hydronephrosis; full re-evaluation after 12-24 months</td>
</tr>
<tr>
<td>Moderate</td>
<td>Symptomatic male or female patients after toilet-training, with high-grade reflux and normal kidneys with LUTD</td>
<td>Initial treatment is always for LUTD with CAP. Intervention may be considered in cases of BT, infections or persistent reflux</td>
<td>In case of persistent LUTD, despite urotherapy, intervention should be considered. The choice of intervention is controversial</td>
<td>Follow-up for UTI and LUTD, kidney status; full re-evaluation after successful urotherapy</td>
</tr>
<tr>
<td>Moderate</td>
<td>Symptomatic male or female patients after toilet-training with low-grade reflux, abnormal kidneys with or without LUTD</td>
<td>Choice of treatment is controversial. Endoscopic treatment may be an option. LUTD treatment should be given if needed.</td>
<td></td>
<td>Follow-up for UTI, LUTD, and kidney status until after puberty</td>
</tr>
<tr>
<td>Moderate</td>
<td>All asymptomatic patients with normal kidneys, with low-grade reflux, with LUTD</td>
<td>Initial treatment is always for LUTD with or without CAP</td>
<td></td>
<td>Follow-up for UTI and LUTD</td>
</tr>
<tr>
<td>Low</td>
<td>All asymptomatic patients with normal kidneys, with low-grade reflux, with no LUTD</td>
<td>No treatment or CAP</td>
<td>If no treatment is given, parents should be informed about risk of infection</td>
<td>Follow-up for UTI</td>
</tr>
<tr>
<td>Low</td>
<td>All asymptomatic patients with normal kidneys with low-grade reflux</td>
<td>No treatment or CAP in infants</td>
<td>If no treatment is given, parents should be informed about risk of infection</td>
<td>Follow-up for UTI</td>
</tr>
</tbody>
</table>

*PNH = prenatal diagnosed hydronephrosis.*
**SO WHAT? STRATEGY:**

Exclude other causes: neurogenic, anatomical anomalies

Treat associated constipation

Treat associated LUTD

Screen siblings (US)

When prenatal HUN, do US first
SO what? Strategy: primary low grade reflux

Y1: prophylaxis

Discussion with the parents when reflux persists after 1 year

If = or > : endoscopic injection

If < : wait till after toilet training

If persistent after toilet training treat endoscopically
SO WHAT? STRATEGY : ALL OTHER FORMS

Tailored therapy based on

Anatomy

Function

Social environment, parental preference

Economic environment

Keep in mind that open reconstructive surgery is still a valuable option for treatment
4 years old boy
9 months old boy
3 Y girl
3 Y girl
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CONCLUSIONS

Exclude secondary reflux

Treat constipation and LUTD

Before 1 Y: Profylaxis in low grade

Adapt to the anatomy, the context, and parent’s wish: aim is to avoid renal damage.

Screen siblings
Thanks!

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