CASE STUDIES OF VESICOCOURETERAL REFLUX
Clinical History Case Study 1

- 3 year old girl with history of UTI
- Potty trained at 2 yr old
- ‘wetting’ accidents during the day, but fully continent during the night.
- Occasional complaint of ‘tummy’ pain.
- Physician suggested renal ultrasound
Ultrasound / RIGHT KIDNEY

RIGHT KIDNEY IS NORMAL IN SIZE WITHOUT HYDRONEPHROSIS
LEFT KIDNEY IS NORMAL IN SIZE WITHOUT HYDRONEPHROSIS
Asked the toddler if she needed to go to the bathroom and she said “no” Interrupted the exam and had mother take child for a walk and gave more fluids for 45 minutes, still the toddler denied need to go to the bathroom Resumed exam…..
Ultrasound / Distended BLADDER

Bladder Volume calculated at 250 ml

Age appropriate bladder size calculated: *

\[ [3 \text{ yr}] + 1 \times 30 = 120 \text{ ml} \]

Renal images/ BLADDER distended

Mild Hydronephrosis at maximum bladder distention
Ultrasound exam / post void BLADDER

Post void bladder volume : 30 ml
which is greater than 10% of maximum bladder volume *
Second Post Void was not successful after 20 minutes of trying

Clinical history Case Study 2

- 20 year old man without history of UTI
- Volunteered as patient for Ultrasound Students
- No symptoms when questioned
  - BUT FINALLY.....
- Admitted to occasional flank/back pain.
- Admitted infrequent need to void bladder
- Admitted bed wetting episodes until age 12
  - Evaluated by urologist and determined that there was nothing wrong.
Ultrasound / RIGHT KIDNEY

Kidney Length 11.7cm
Ultrasound / RIGHT KIDNEY

Resistive Index: 0.58
Ultrasound / Left KIDNEY

Kidney Length 14.2cm
Ultrasound / Left KIDNEY

Dual Collection system
Ultrasound / Left KIDNEY

Resistive Index .64
Resistive Index .55
PREVOID BLADDER

Bladder Volume 589 ml

Dual left jets
Post void bladder and Hydro

Bladder volume 38.4 ml
Most cases of VUR are PRIMARY

ureter did not grow long enough during Fetal development.

Intramural and Submucosal segment of the ureter is not long enough to close during bladder distention

This type of VUR can get better or disappear as a child gets older. As a child grows, the ureter gets longer and function of the valve improves.
The effectiveness of valvular function is dependent on the length of the distal ureteral that lies within the bladder wall: a shorter intramural–submucosal segment increases the likelihood of VUR.
VUR Stages
The primary diagnostic procedure for evaluation of VUR is a voiding cystourethrogram requiring bladder catheterization.
Other Testing for VUR

- Nuclear Medicine
- Ultrasound
- MRI

Right Long Kidney
Fetal Hydro – First Sign

Fetal Hydronephrosis → Postnatal Renal Ultrasound (Antibiotic Prophylaxis)

- Severe: Consult Paediatric Urologist
- Mild/Moderate: Micturating Cystourethrogram
  - VUR: ? Continue Antibiotics
  - No VUR: Cease antibiotics → Isotopic renography
    - PUJ Obstruction: Consult Urologist
    - No PUJ obstruction: Monitor Serial Ultrasounds
Prevalence

- VUR is present in more than 10% of the population.
- In children without urinary tract infections 17.2-18.5% have VUR
- Those with urinary tract infections the incidence may be as high as 70%
Age

- Younger children are more prone to VUR due to ureter length.
- This decreases with age as ureter length grows.
- Children under the age of 1 year with a urinary tract infection, 70% will have VUR.
- This number decreases to 15% by the age of 12.
Treatment and prognosis

- If reflux is unrecognized patients are likely to develop recurrent UTI
- Infections can result in renal scars and eventually renal failure
- Prophylactic antibiotic treatment in low grades and surgical reimplantation in higher grades are aimed at reducing the risk of scarring and reflux nephropathy