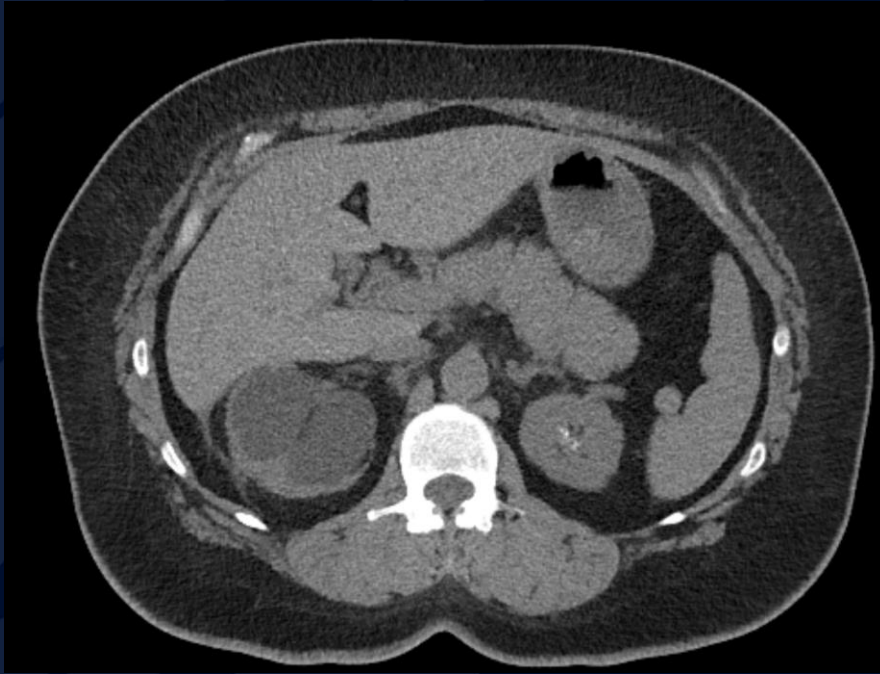


A large, stylized oak leaf graphic in a dark blue color, positioned on the left side of the slide, partially overlapping the text.

# 40 year old female presents with flank pain

Elena G. Violari MD

David Karimeddini MD



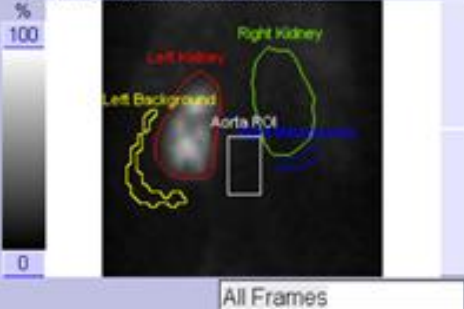
Renal W/Lasix 8/8/2018



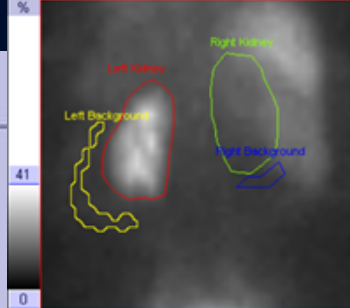
Table of Result Summary

Parameters	Left	Right
Split Function (%)	89.4	10.6
Kidney Counts (cpm)	110756	13137
Kidney Depth (cm)	8.934	8.996
Renal Retention	0.460	0.320
Time of Max (min)	3.001	0.400
Time of 1/2 Max (min)	14.7	0.445
Time from Max to 1/2 Max (min)	11.7	0.045

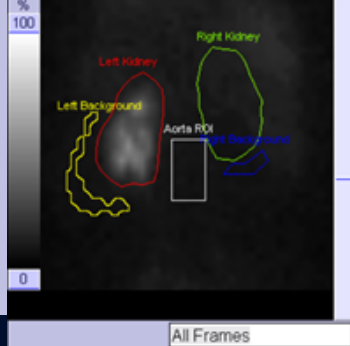
Renal W/Lasix (Results) 8/8/2018



Renal W/Lasix (Results) 8/8/2018



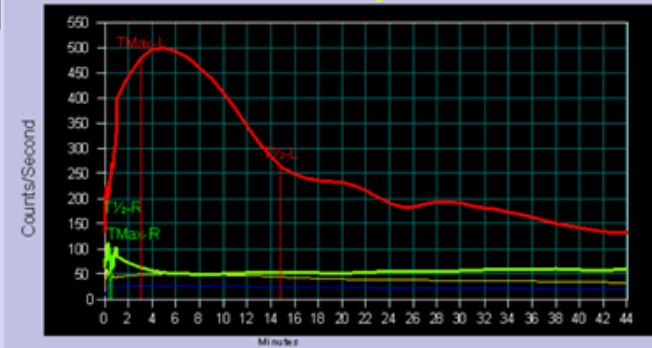
Renal W/Lasix (Results) 8/8/2018



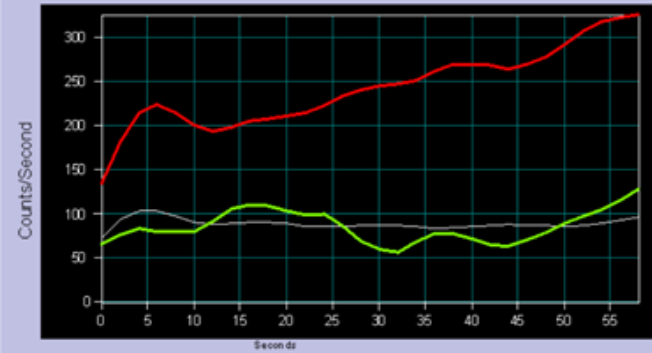
- Left Kidney
- Right Kidney
- Left Background
- Right Background

- Left Kidney
- Right Kidney
- Aorta

## Kidney



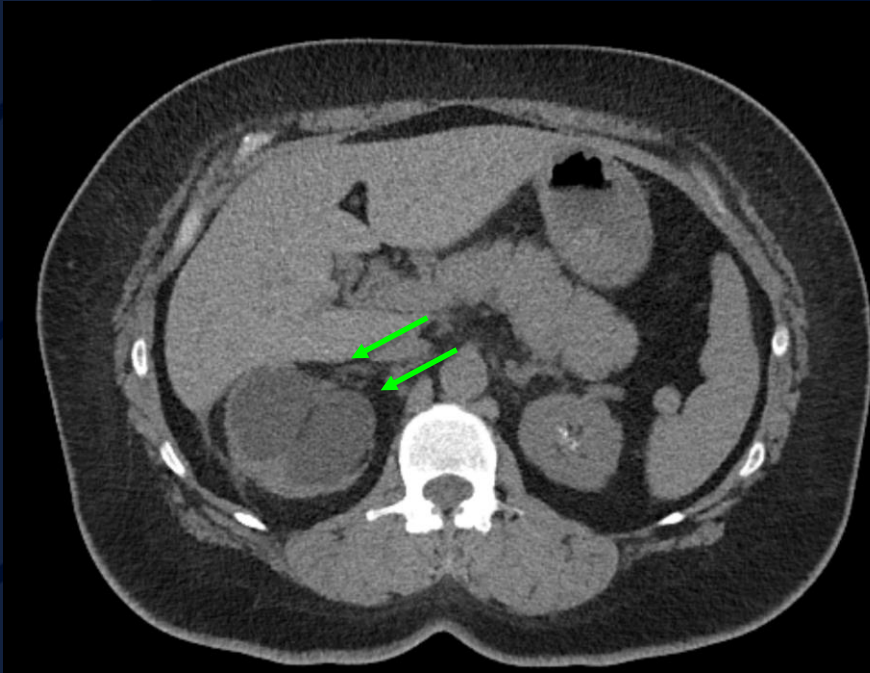
## Flow



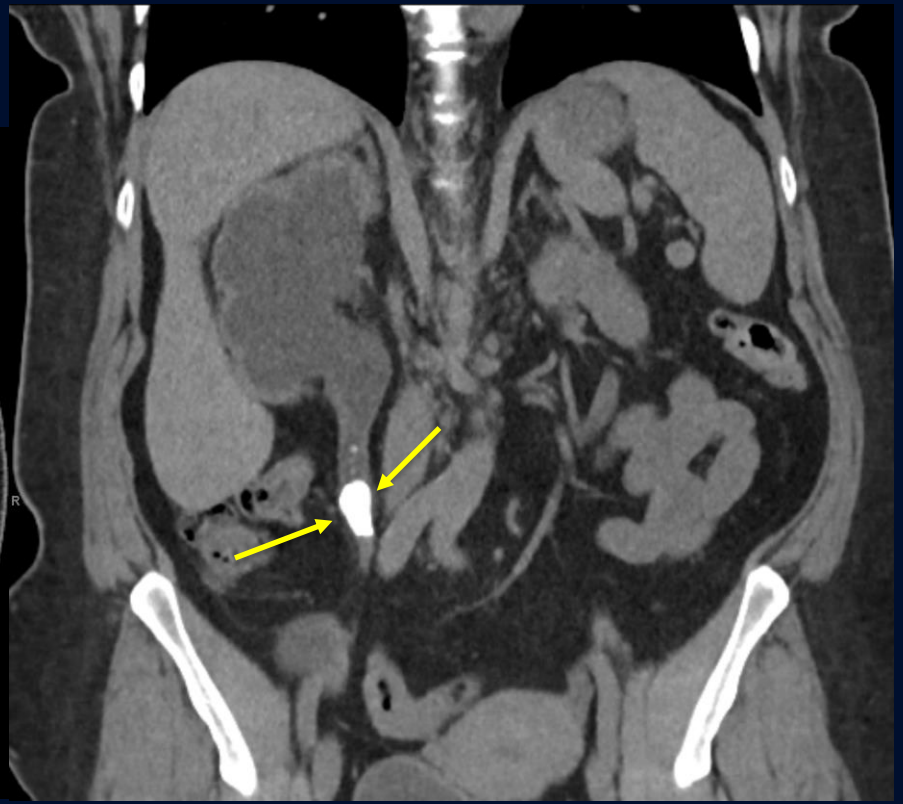
A large, stylized oak leaf graphic in a dark blue color, positioned on the left side of the slide. It features detailed vein patterns and a lobed edge.

?

# Obstructive Uropathy

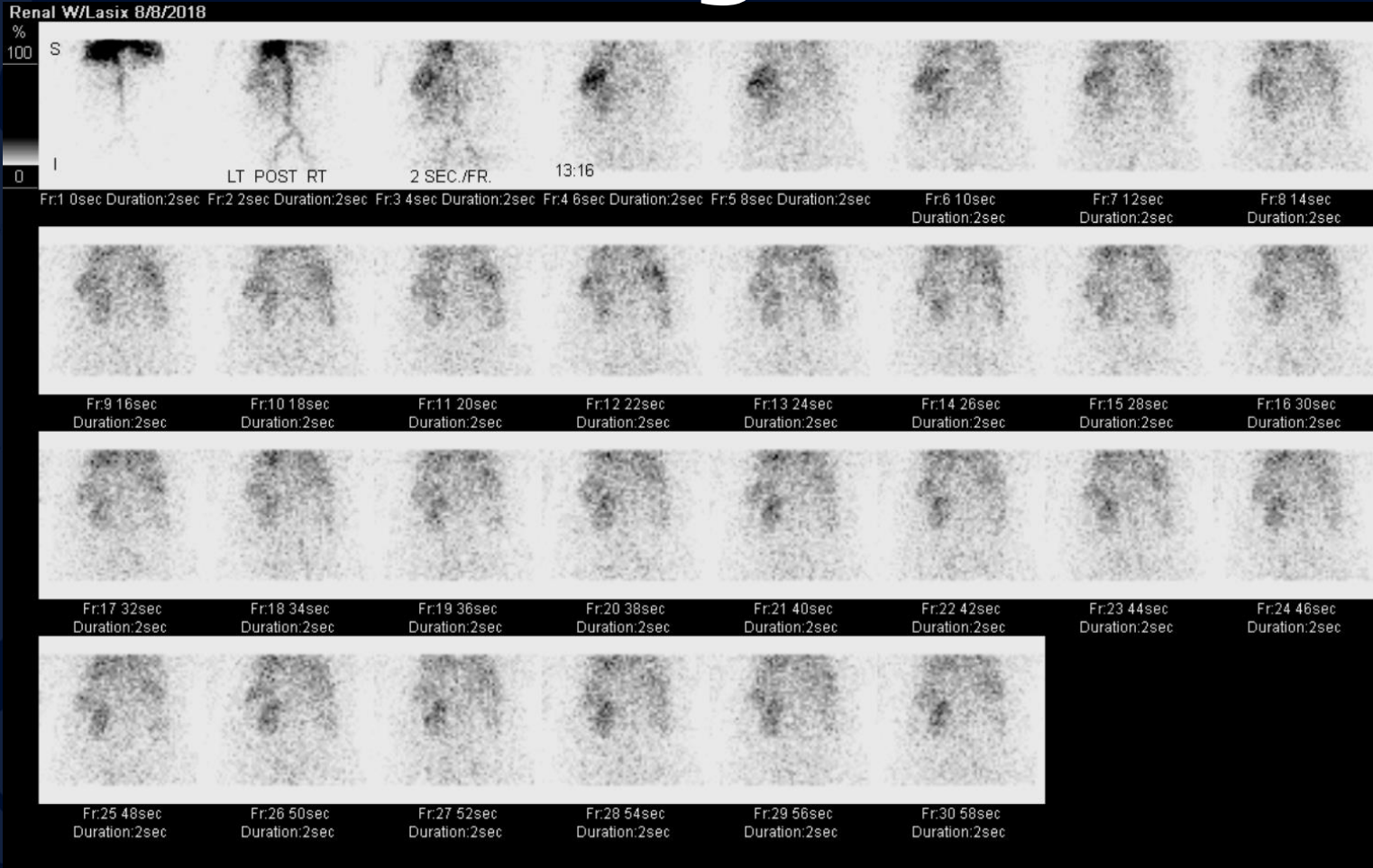


Severe  
hydronephrosis



Severe hydronephrosis  
secondary to a large proximal ureteral  
stone

# Renogram



Right kidney shows absent perfusion during the angiographic phase as well as absent uptake.

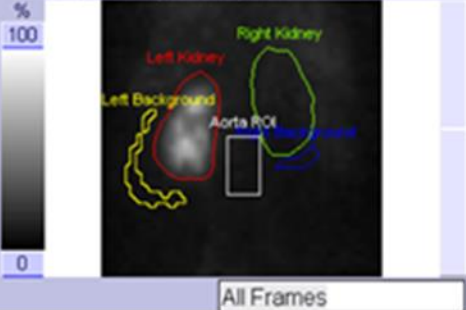


# Renogram

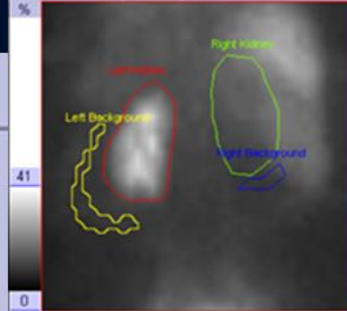
Table of Result Summary

Parameters	Left	Right
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Renal W/Lasix [Results] 8/8/2018

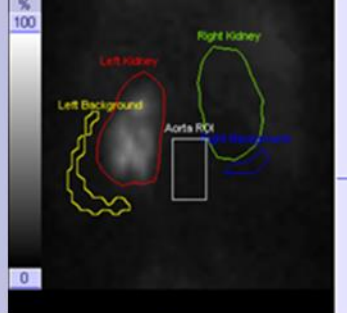


Renal W/Lasix [Results] 8/8/2018



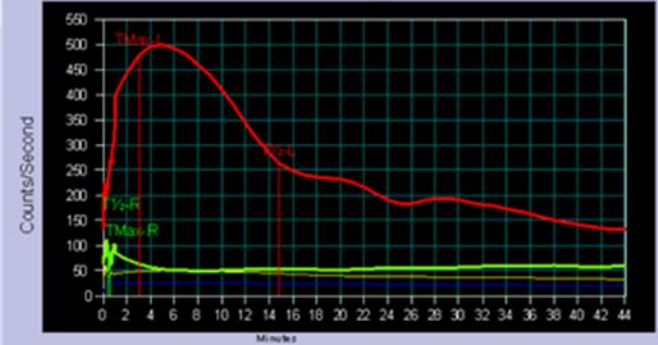
Legend:  
 Left Kidney (red line)  
 Right Kidney (green line)  
 Left Background (yellow line)  
 Right Background (blue line)

Renal W/Lasix [Results] 8/8/2018

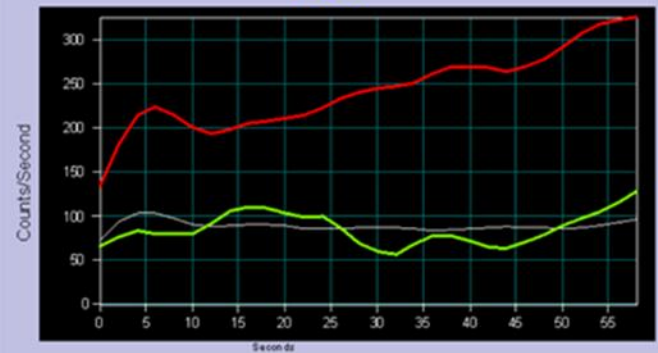


Legend:  
 Left Kidney (red line)  
 Right Kidney (green line)  
 Aorta (grey line)

Kidney



Flow



# Renogram

## Tc-99m MAG 3:

- Mechanism: **Tubular Secretion**
- Dose: 10-20 mCi
- Estimates: **Effective renal plasma flow (ERPF)** which estimates renal clearance (80% secretion and 20% GFR)
- **ADVANTAGE:** protein bound and provides better target to background than DTPA
- **DISADVANTAGE:** Indirectly shows renal function

## Tc-99m DTPA:

- Mechanism: Glomerular Filtration
- Dose: 10-20 mCi
- Estimates: GFR
- **ADVANTAGE:** Great for renal physiology (function)
- **DISADVANTAGE:** Poor imaging characteristics in cases of renal insufficiency

## TECHNIQUE/ANALYSIS:

“Angiogram”: 1 second per frame x 60 seconds

“Nephrogram”: 30-45 minutes at 2-3 minutes intervals

**Split function:** measure counts in the ROI's at 2-3 minutes, before excretion occurs

### Clearance metrics:

- Time to peak - quicker the better. In general , normal is 3-5 minutes
- T1/2 clearance - quicker the better. Normal is 7-10 minutes
- Fraction remaining at 20 minutes - lesser the better

# Renogram

**Diuretic Renogram** is performed to evaluate whether a persistent nephrogram is secondary to obstruction or not. If Lasix triggers drainage, then it's not obstructed.

In our case, Lasix was not required.

Dose: 0.3-0.5 mg/kg in adults = 20-40 mg, 80 mg or more for patients with renal failure or on chronic Lasix

Dose: 1 mg/kg in infants = 5-10 mg

Bladder needs to be empty - put in a Foley if needed.

## Classification

- **"Normal" =  $T_{1/2} < 10$  minutes**
- **"Indeterminate for obstruction" = 10 - 20 minutes**
- **"Mechanical obstruction" =  $T_{1/2} > 20$  minutes**

# References:

1. Radiopedia.com
2. Esteves FP, Taylor A, Manatunga A et-al. 99mTc-MAG3 renography: normal values for MAG3 clearance and curve parameters, excretory parameters, and residual urine volume. Am J Roentgenol. 2006;187 (6): W610-7
3. Mallek R, Bankier AA, Etele-Hainz A et-al. Distinction between obstructive and nonobstructive hydronephrosis: value of diuresis duplex Doppler sonography. Am J Roentgenol. 1996;166 (1): 113-7.
4. Kleiner B, Callen PW, Filly RA. Sonographic analysis of the fetus with ureteropelvic junction obstruction. Am J Roentgenol. 1987;148 (2): 359-63.
5. Guiberteau MJ. Essentials of Nuclear Medicine Imaging: Expert Consult - Online and Print, 6e. Saunders. ISBN:1455701041.