

# CIRA Case of the Week

## December 2016

Case Courtesy of Drs. Rohan Parab and Rahim Samji



**UNIVERSITY OF ALBERTA**  
**FACULTY OF MEDICINE & DENTISTRY**  
Department of Radiology & Diagnostic Imaging

# Patient Presentation

34 year old male presenting to the ED on March 3, 2015 with painless, atraumatic hematuria.

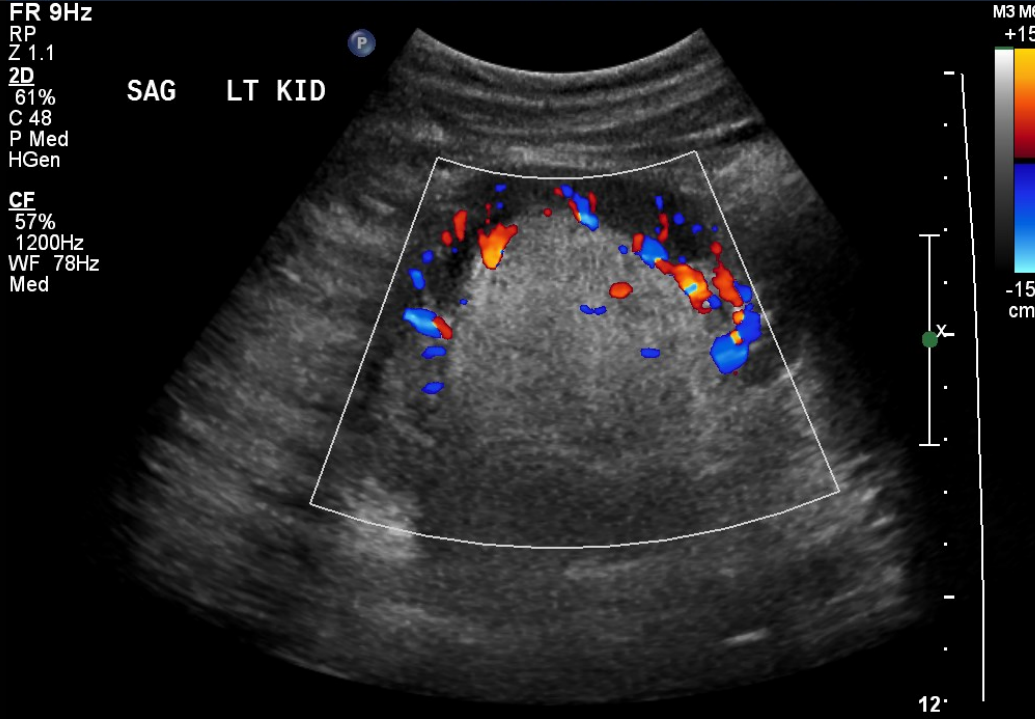
# Workup

- Urinalysis from March 3, 2013 demonstrated red turbid urine. Macroscopic and microscopic assessment not possible due to urine color.
- Bloodwork:
  - PT, PTT, Platelets – Normal
  - Hgb – Normal
  - Creatinine - Normal

PHILIPS 12/03/2013 01:08:30PM TIS0.4 MI 1.2  
KG LEDUC COMMUNITY HOS C5-1/Abd Renal



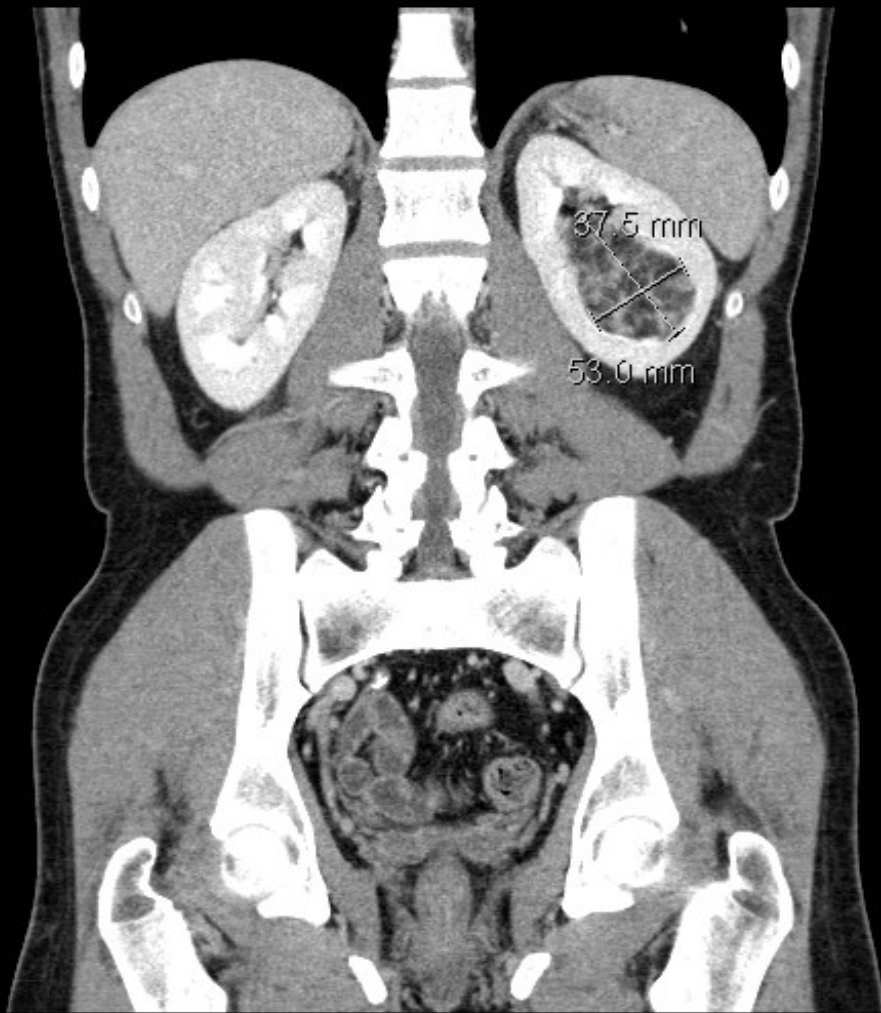
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March 12, 2013 - renal ultrasound B-mode and Doppler imaging

# Ultrasound – March 12, 2013

- Left renal hyperechoic structure measuring 5.3cm in maximal dimension.
- DDX: Angiomyolipoma, RCC, Renal oncocytoma.
- Further evaluation with CT recommended.

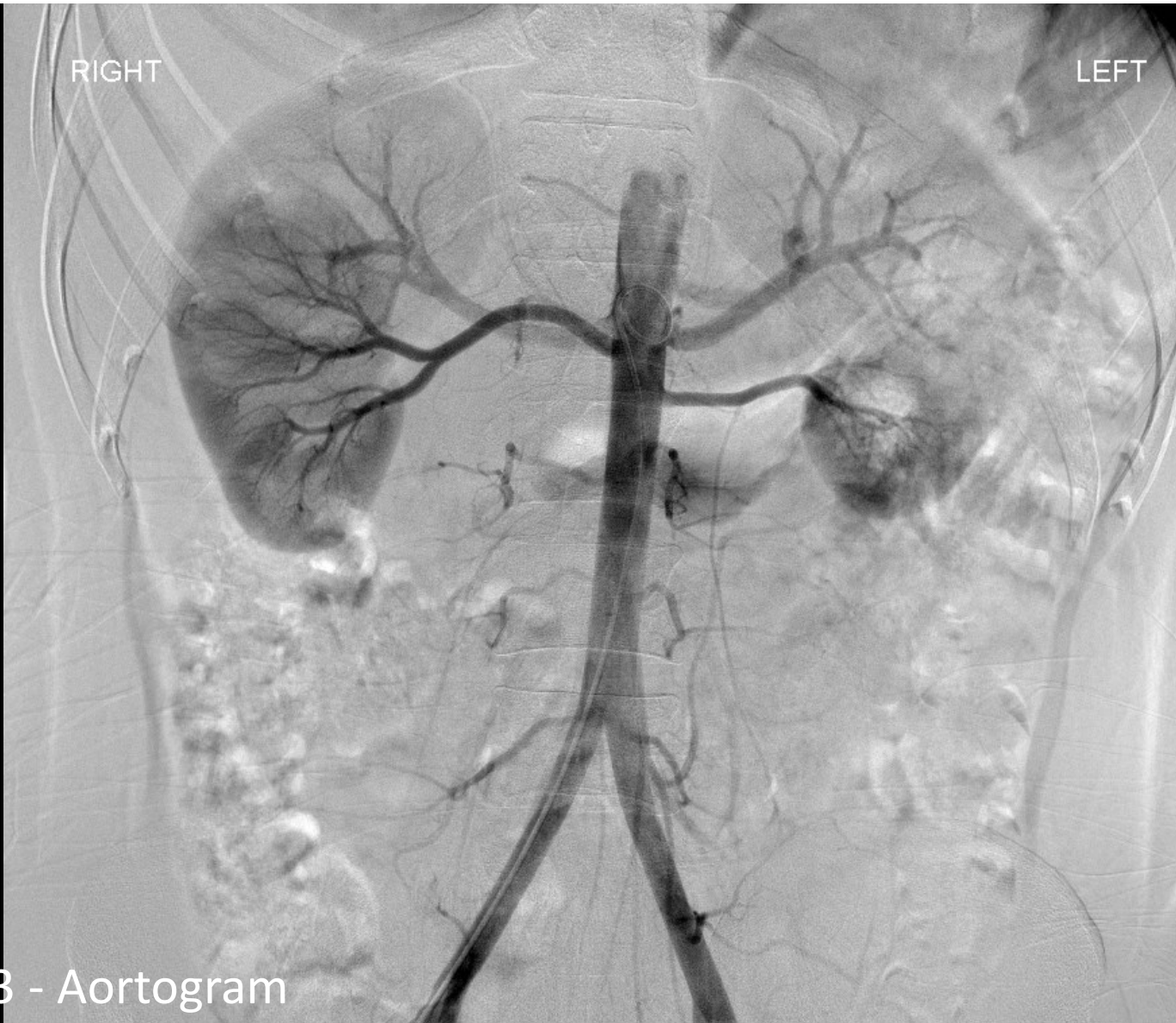


March 18, 2013 - CT urogram follow-up

# CT – March 18, 2013

- 5.3 x 3.8 x 3.6 cm (transverse x AP x craniocaudal) well-demarcated, heterogeneous AML with enhancing septations in the central left kidney, measuring approximately -65 HU in attenuation.
- Increased risk of hemorrhage at > 4 cm
- Plan
  - Arterial embolization

# Diagnostic Aortogram



June 28, 2013 - Aortogram



June 28, 2013 - Aortogram

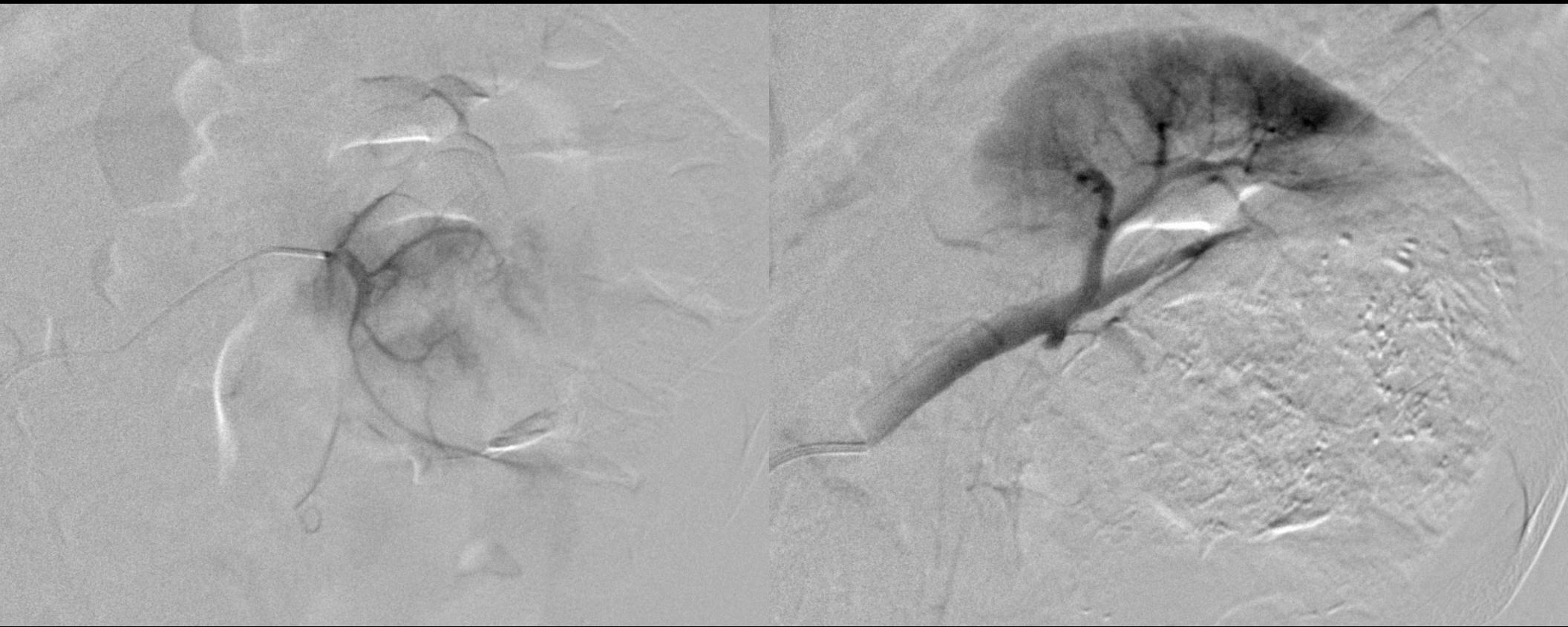
# Aortogram – June 28, 2013

- Pigtail angiogram of the abdominal aorta reveals a large left main renal artery and a smaller lower pole accessory left artery.
- The AML is exclusively supplied by multiple branches of the superior left main renal artery.

Embolization



September 20, 2013 - Selective segmental arterial embolization



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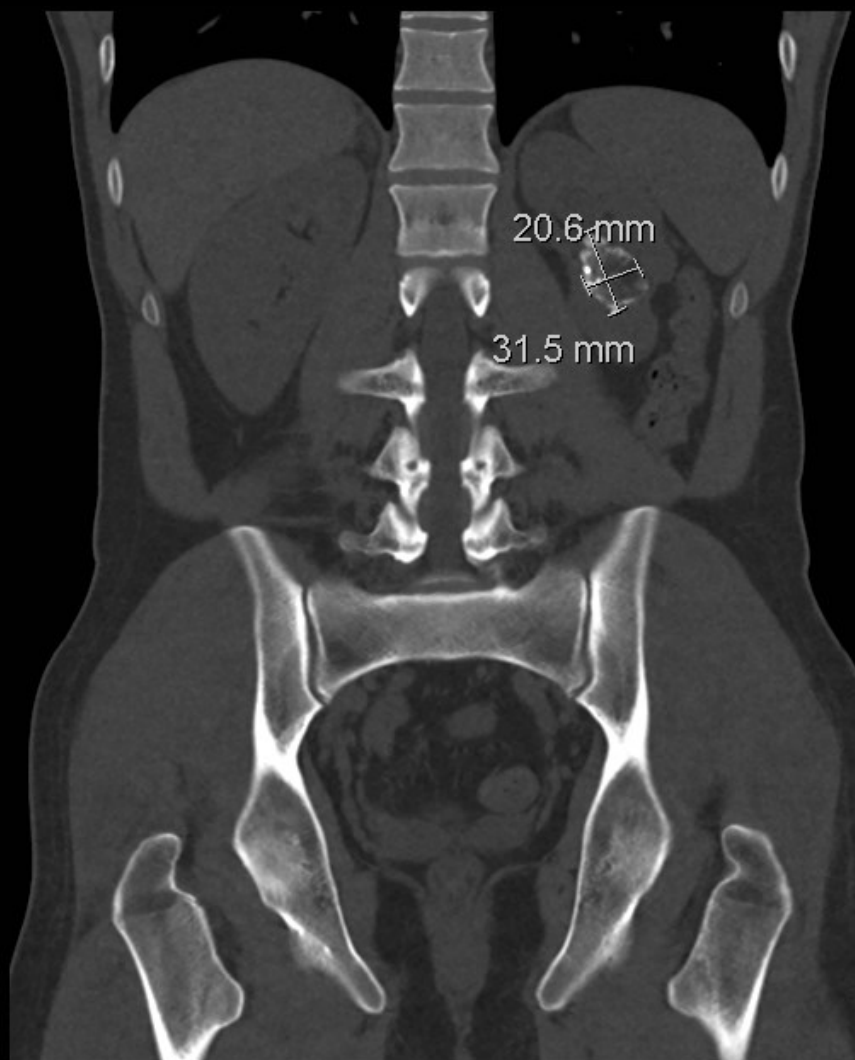
# Embolization – September 20, 2013

- The distal branches of the main superior left renal artery supplying the AML were superselected and embolized with ethanol:lipiodol mixture (7 mL ethanol: 3 mL lipiodol) for a total of 4.7 mL of liquid embolic.
- Post-embolization angiogram demonstrated stasis of flow through the embolized segmental arteries supplying the AML and patent flow through the remainder of the arteries supplying renal parenchyma.

# Routine follow-up

- Follow-up scheduled for 3, 6 and 12 months post procedure
- Follow-up consists of:
  - CT scan
  - Clinic visit

3 month follow-up

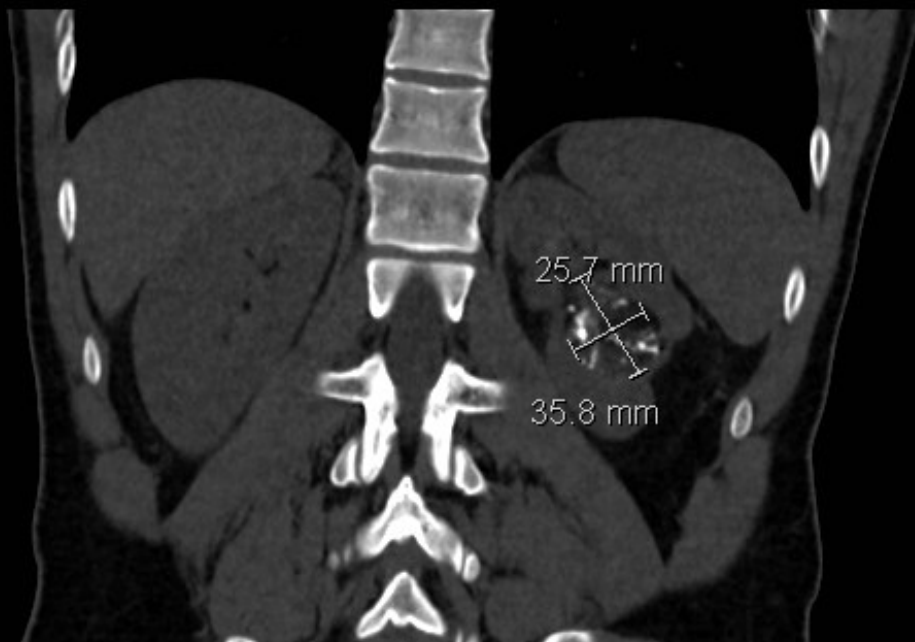


December 30, 2013 - 3 month CT follow-up

# 3 month follow-up clinic visit

- Patient asymptomatic.
- Complete lipiodol staining of the tumor.
- Adequate volume reduction with post-embolization  
AML measuring 3.2 x 2.1 x 3.7 cm (previously 5.3 x 3.8 x 3.6 cm TR/AP/CC).
- Much lower risk of bleeding now that it is <4 cm.

6 month follow-up



March 21, 2014 - 6 month CT follow-up

# 6 month follow-up

- Decreased size of AML on CT now measuring 3.6 x 2.6 x 3.4 cm (initially 5.3 x 3.8 x 3.6 cm TR/AP/CC).
- Patient remains asymptomatic.
- Scheduled final follow-up in 6 months. Following this, the patient can be followed every two years with ultrasound.

12 month follow-up



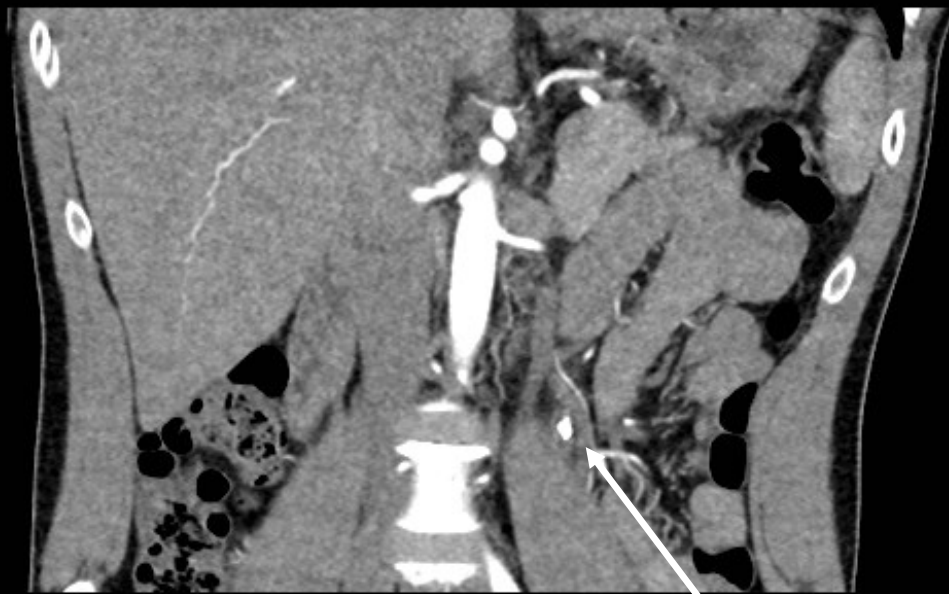
October 9, 2014 - 1 year CT follow-up



October 9, 2014 - 1 year CT follow-up

# 12 month follow-up

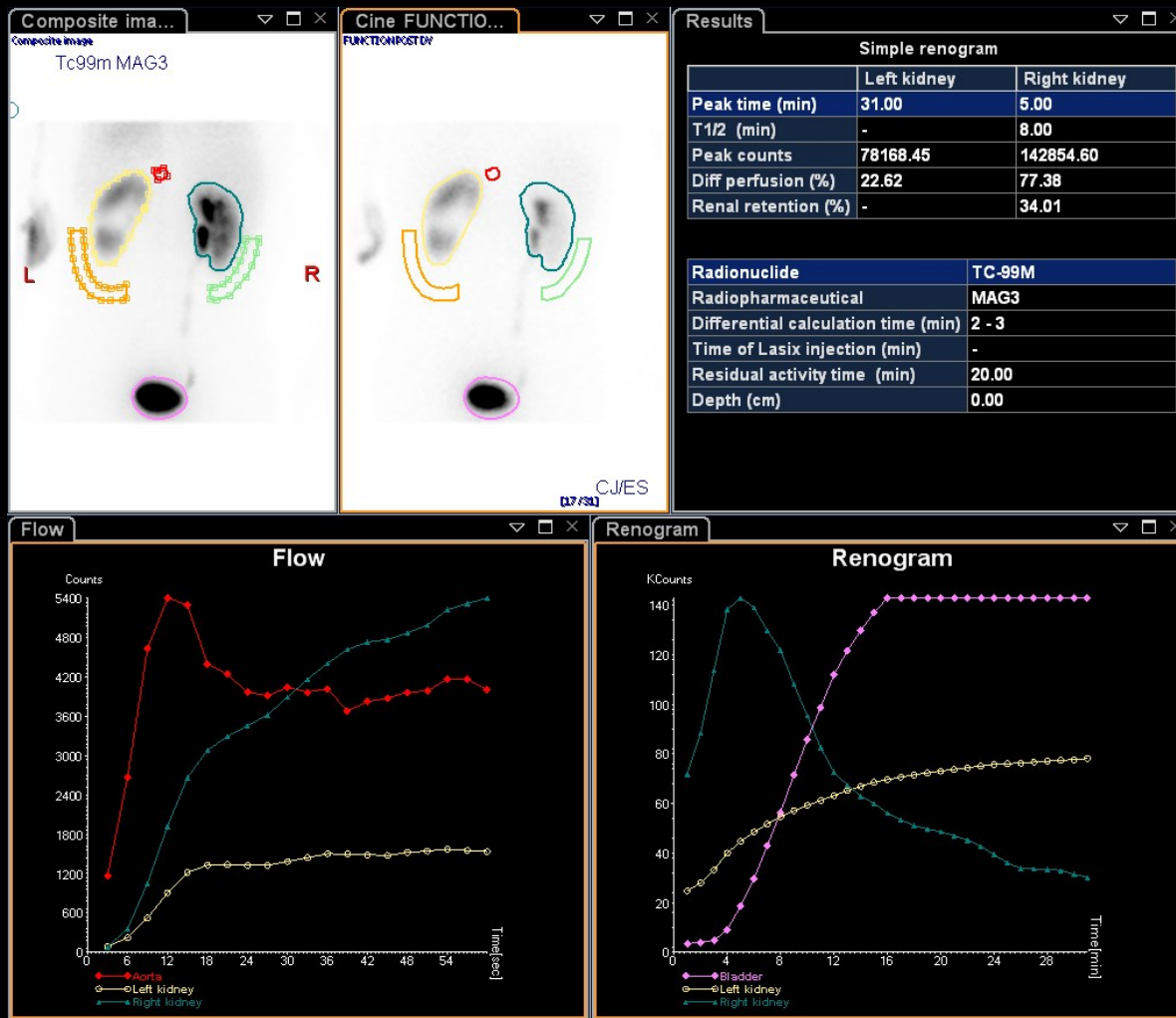
- Patient describes symptoms of renal colic with left-sided flank pain.
- Multiple fragments (at least 3) of Lipiodol embolic material entered the collecting system and migrated down the ureter to beyond the UP junction. Largest measures 11 mm. Mild dilatation of left urinary collecting system.
- Minimally diminished size of the AML since prior.
- Urology requested CT urogram and MAG-3 study to assess obstruction and split function.



October 15, 2014 – CT urogram as per urology



October 15, 2014 - CT urogram



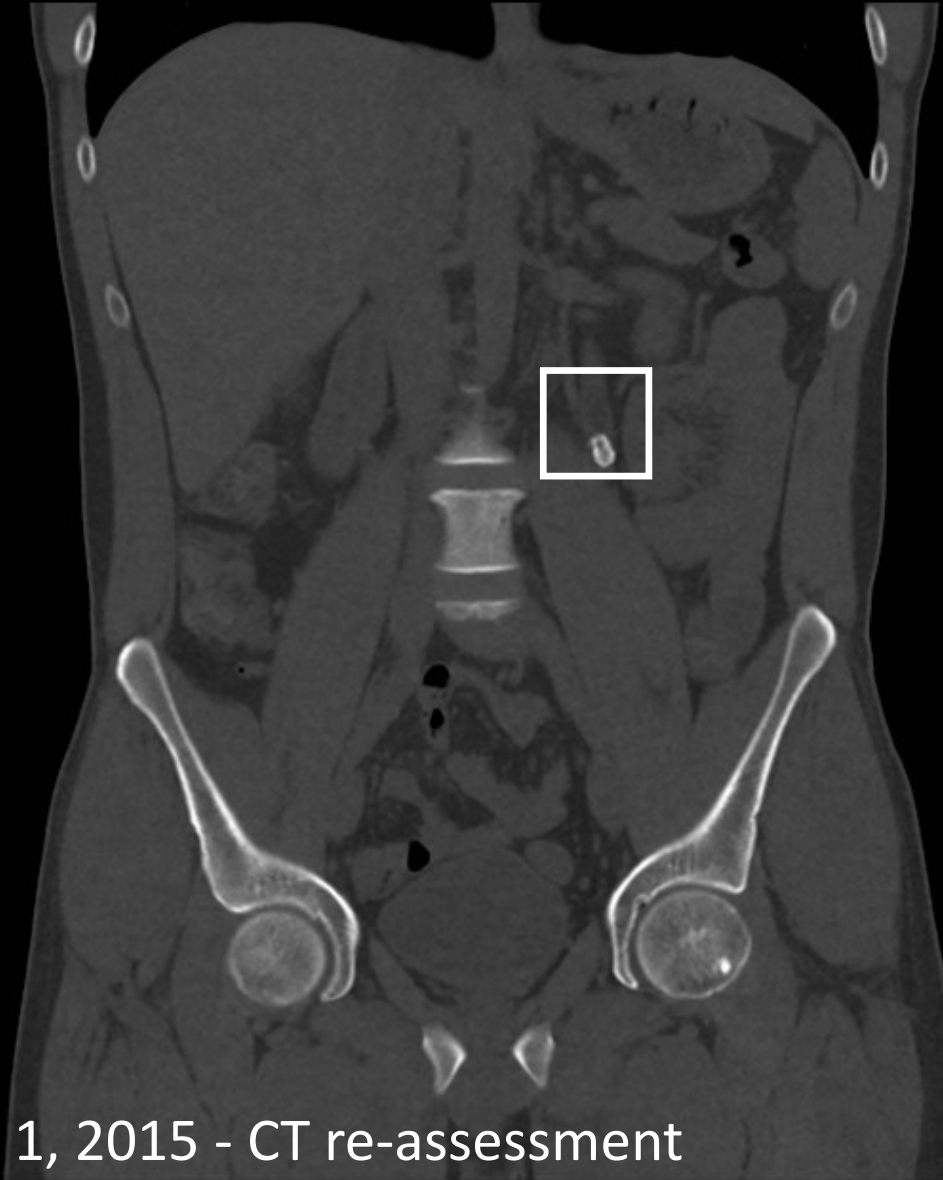
October 15, 2014 – MAG-3 scintigraphy to assess for obstruction and split function

# Study results

- CT urogram:
  - High grade L UPJ obstruction with moderate hydronephrosis.
- Tc-99m mercaptoacetylglycine (MAG-3) study with delayed images at 3 hours.
  - Delayed perfusion, parenchymal uptake, transit time and clearance in the L kidney. Holdup of radiotracer in patulous upper and lower pole collecting system in keeping with hydronephrosis.
  - Split function 23% on left and 77% on right. Therefore decreased left-sided function.

# Patient lost to follow-up

Patient re-presents 6 ½ months later



May 1, 2015 - CT re-assessment

# CT re-assessment May 1, 2015

- The patient was unfortunately lost to follow-up and came back for a scan the week of the ureteroscopy.
- There are small bits of the tumor that have migrated to the level of the impacted calculus (fat attenuation in the proximal ureter at -32 HU).
- Plan
  - Ureteroscopic laser lithotripsy with basket extraction.

# Ureteroscopy and laser lithotripsy

June 24, 2015



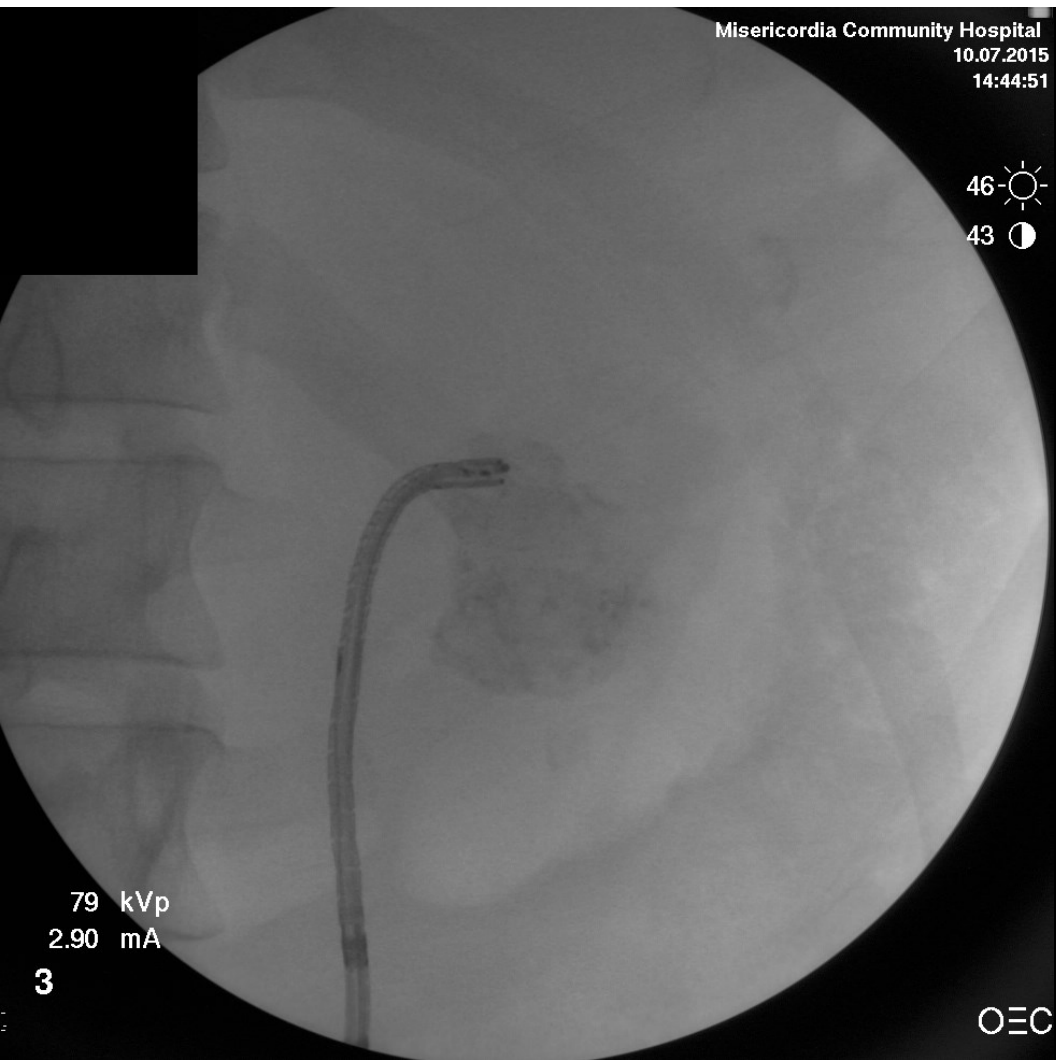
June 24, 2015 - Left ureteroscopic image of obstructing lipiodol

# Ureteroscopy – OR report

- “We navigated the scope up to the obstructing foreign body which again was bright yellow and looks much like a uric acid stone but is likely the foreign body since they do not fragment in a similar manner as to uric acid stone. They fragment almost as though they are made of glue”.
- **“We fragmented it as best we could but this patient undoubtedly will require secondary procedure.”**

# Second procedure

July 10, 2015



July 10, 2015 - Urogram following second ureteroscopic laser lithotripsy and basket extraction

# Follow-up Urogram – OR report

- “I was able to identify a large amount of this lipiodol foreign body material occupying the entire lower pole and middle calyx. This represents embolization material extruding into the collecting system.”
- “This large stone is too large to deal with ureteroscopically. It is currently in a non-obstructive position and does not look mobile enough to move.”

# Clinical outcomes

- Successful embolization of the large left sided angiomyolipoma with a final maximal dimension <4 cm substantially decreasing the risk of hemorrhage.
- Unexpected complication of lipiodol migration to the urinary collecting system resulting in a high grade left urinary tract obstruction.
- Left urinary tract obstruction treated with two episodes of ureteroscopic laser lithotripsy with basket extraction.

# References

- Li *et al.* Role of embolization in the treatment of renal masses. *Semin Intervent Radiol* 2014; 31:70-81
- Oesterling *et al.* The management of renal angiomyolipoma. *The Journal of Urology* 1986; 135: 1121-1124
- Wagner B. *et al.* From the Archives of the AFIP; Adult Renal Hamartomas. *Radiographics* 1997; 17:155-169