

CAIR Case of the Month

Case Courtesy of Drs. A. Dalton and R. Gullipalli
Memorial University

Purpose

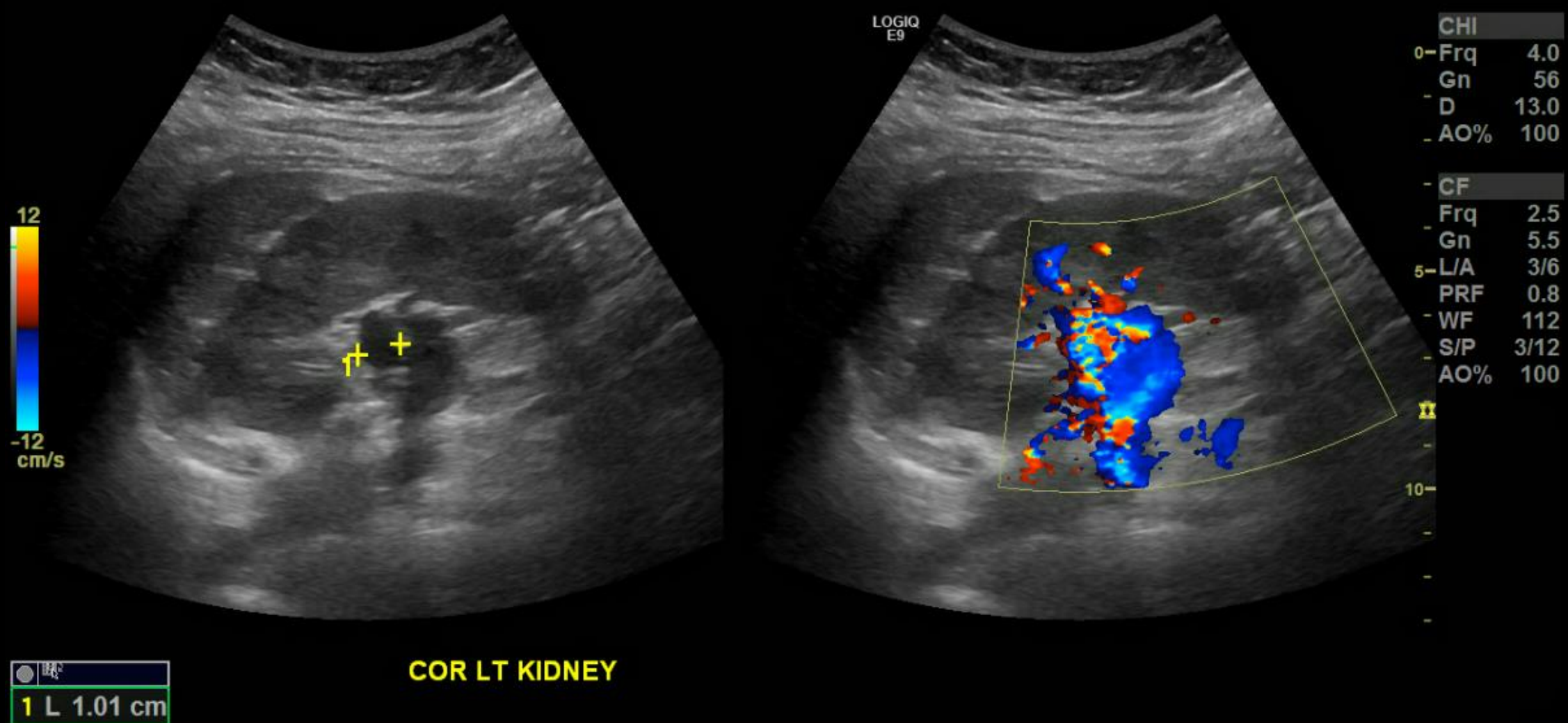
- To discuss the implications of renal artery aneurysms during pregnancy
- Present a case of a patient with renal artery aneurysm which was successfully embolized prior to delivery
- Discuss the role of multi-disciplinary management of this patient

Case Presentation

- 39 year old female, G2P1, 15 weeks pregnant
- Presented with right upper quadrant pain
- Abdominal ultrasound was ordered to rule out cholecystitis

Relevant History

- Past medical history
 - Cholelithiasis
- Past obstetrical history
 - Previous caesarean section, healthy baby, no complications
- Medications
 - Folic acid
 - Prenatal vitamin
- Allergies
 - NKDA
- Social history
 - Non-smoker
 - No alcohol



Abdominal ultrasound reveals a 1 cm hypoechoic lesion with internal Doppler flow, suspicious for an aneurysm



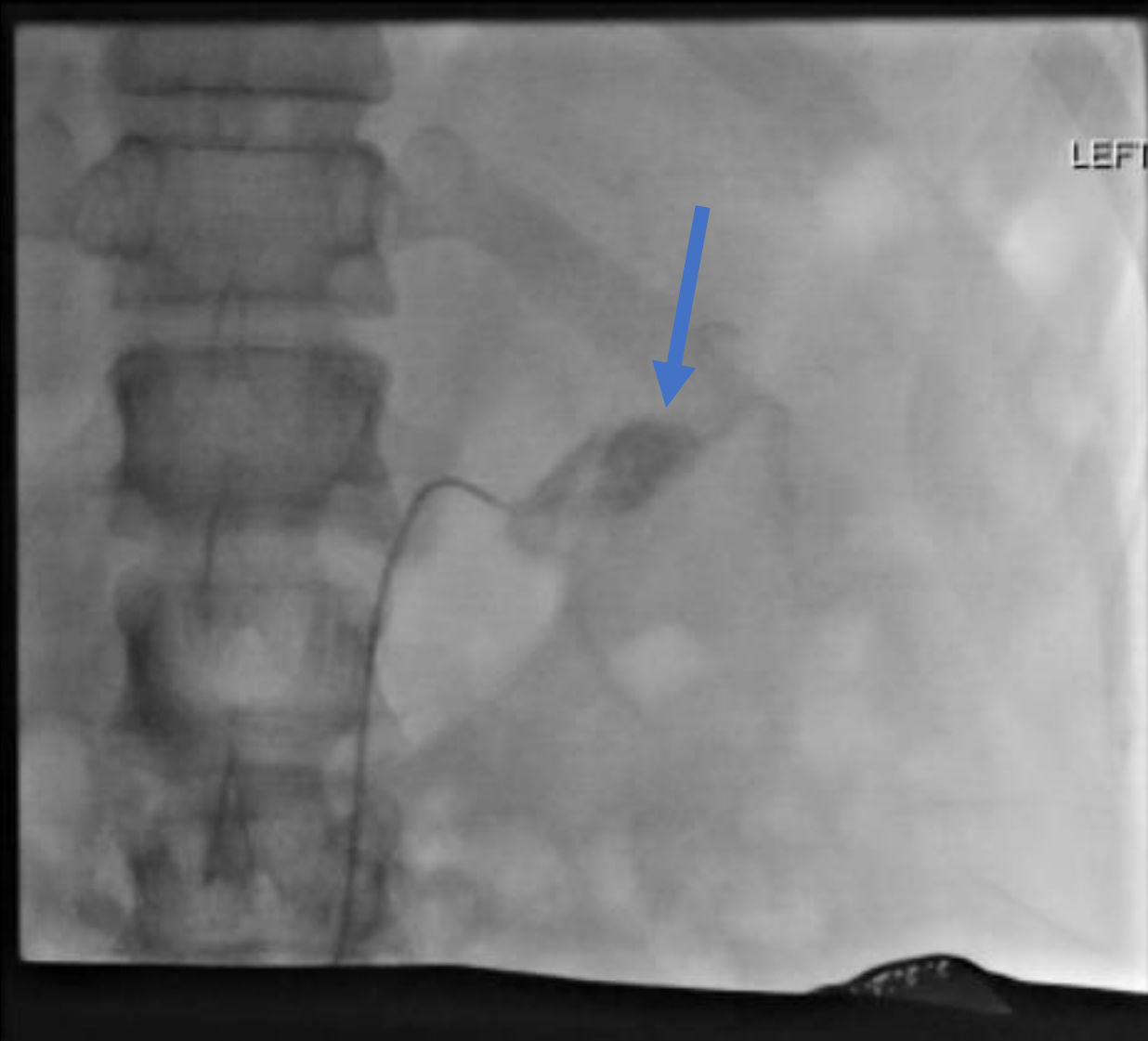
Time of flight MRI reveals a 1.4 cm left renal artery aneurysm (blue arrow) arising from the origin of the middle pole branch of the left renal artery

Multidisciplinary Team Approach

- Multidisciplinary team discussed the risks versus benefits, including radiation exposure to fetus, risk of rupture, and complications associated with embolization
 - Interventional radiology
 - General surgery
 - High-risk obstetrics
 - General radiology
 - Medical physics
 - Anesthesiology
 - Hematology

Current Literature

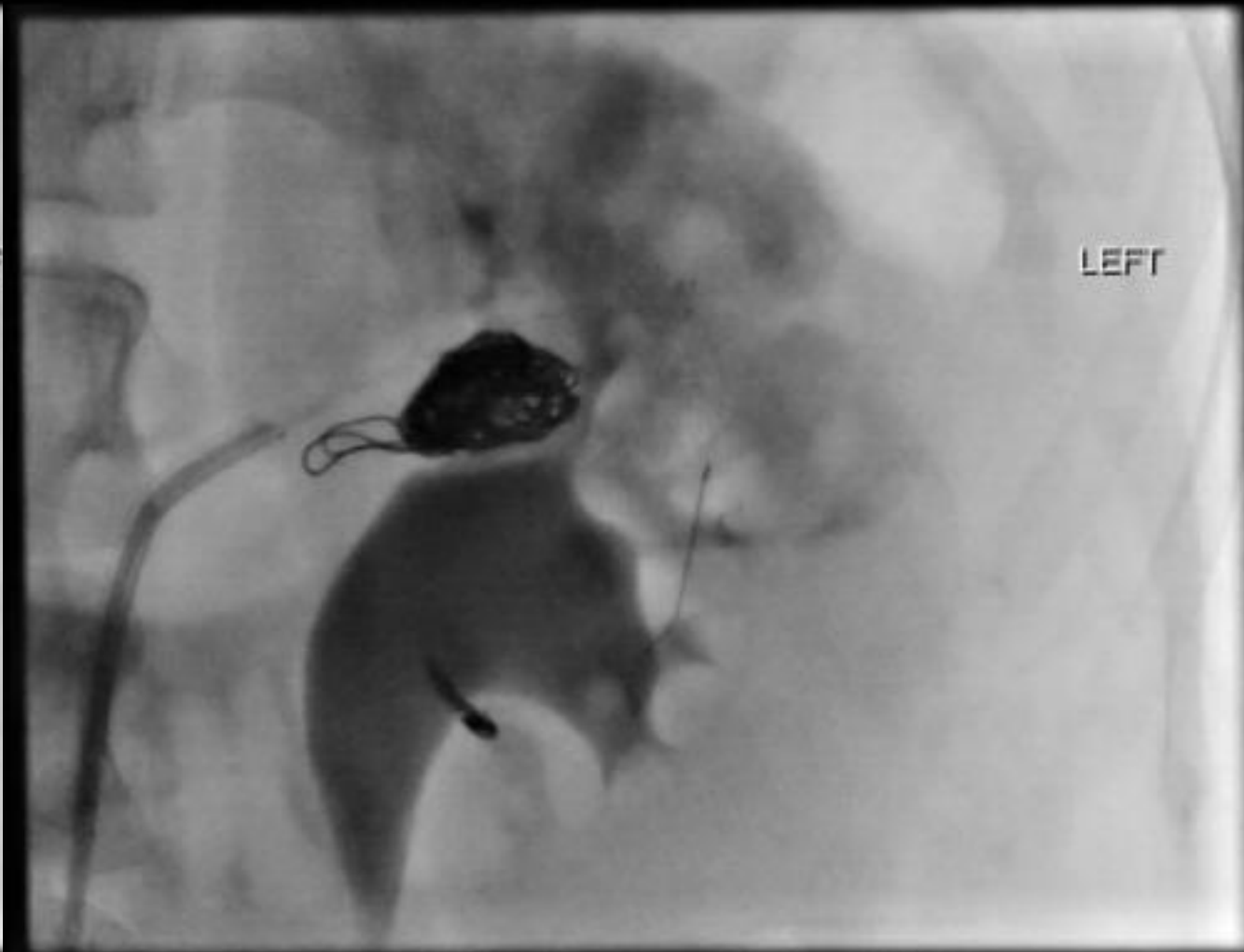
- It is documented in the literature that there is a high mortality risk for mother and fetus with rupture of a visceral aneurysm
- There is a higher risk of rupture of aneurysms in the third trimester of pregnancy



- Contrast injection reveals the renal artery aneurysm off the upper pole branch (blue arrow)
 - Patient was late second trimester



Embolization of left renal artery aneurysm using stent assisted coiling technique with a filling defect in upper pole branch (blue arrow)



- Post-angioplasty
- Improved blood flow with good filling of the mid and upper renal parenchyma

Stent-Assisted Coiling of Aneurysm

- Lose dose radiation (three frames per second) avoiding oblique projections and exposures
- A bolus of Heparin and intra-arterial nitrates was administered during the procedure
- 4 French C2 catheter and 0.035" guidewire were used to cannulate the left renal artery
- A 5 mm x 30 mm ev3 Solitaire AB stent was positioned across the mouth of the aneurysm
- A Marksman microcatheter and 0.014" guidewire were advanced further distally into the lower pole branch
- Using a 4 mm micro coil, the lower pole branch was embolized distal to the aneurysm
- Following this, the catheter was pulled back into the aneurysm and coils ranging from 8 mm to 14 mm were deployed, appropriately packing the aneurysm

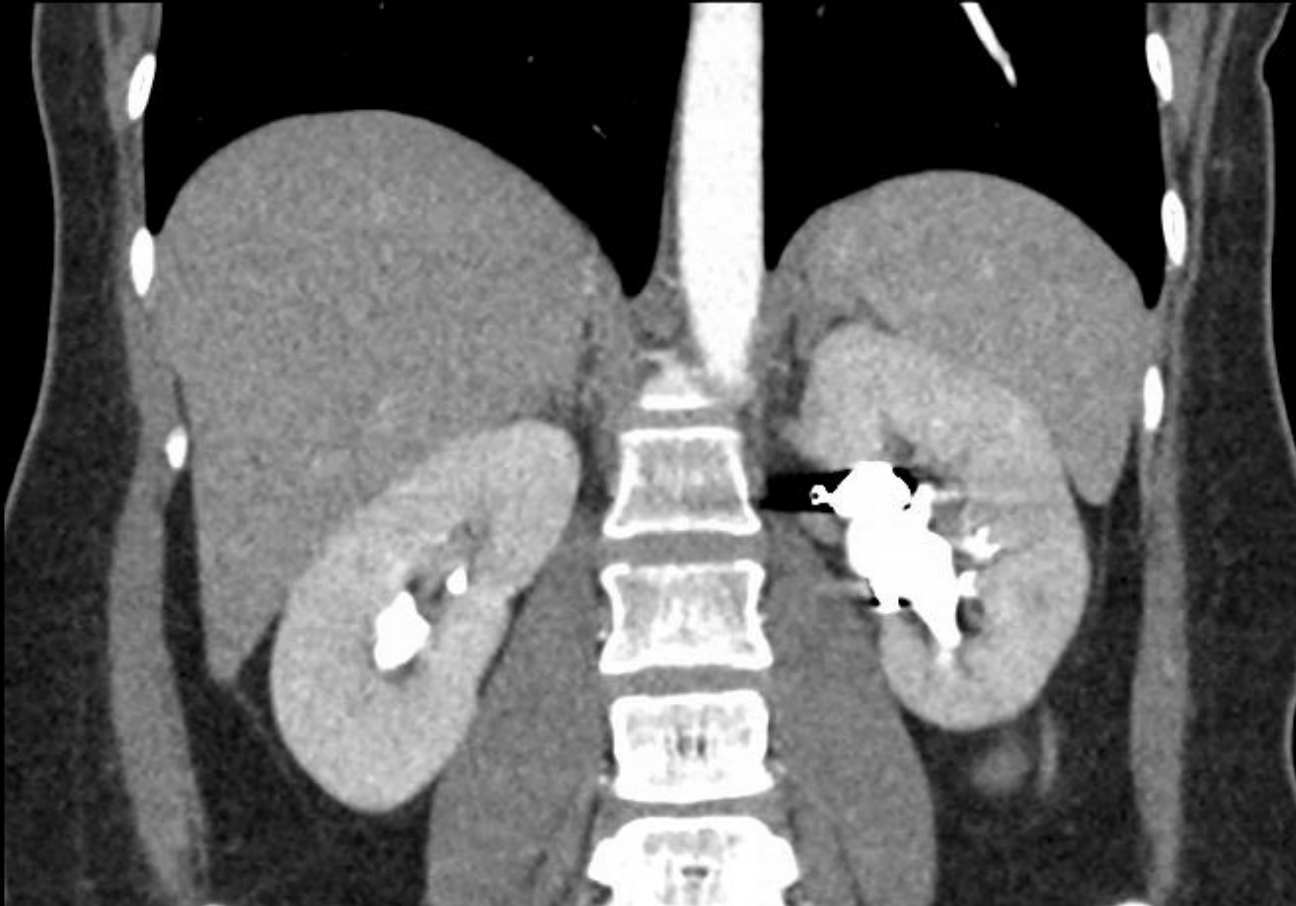
Procedure (cont..)

- Limited contrast injection revealed thrombus in the stent compromising blood flow
 - 4 mm balloon angioplasty was performed to improve the inflow into the left kidney
- Immediately, two 81 mg ECASA were administered to the patient
- High-risk obstetrics was contacted with a view to give Plavix as well for dual antiplatelet therapy
- High-risk obstetrics in St. John's kindly contacted the maternal high-risk group in Toronto for further advice due to very minimal information available on the literature
- A 300 mg loading dose of Plavix was administered

Follow-Up

- Uneventful spontaneous vaginal delivery of a healthy baby
- Maternal kidney was completely preserved with normal renal function

Follow-Up Imaging



Post-procedure enhanced CT reveals good perfusion to the left kidney following embolization

References

- 1. Lacroix, H.; Bernaerts, P.; Nevelsteen, A., and Hanssens, M. Ruptured renal artery aneurysm during pregnancy: Successful ex situ repair and autotransplantation. *Journal of Vascular Surgery* **2001**, *33*(1), 188-90.
- 2. Hwang, P. F.; Rice, D. C.; Patel, S. V., and Mukherjee, D. Successful management of renal artery aneurysm rupture after caesarean section. *Journal of Vascular Surgery*. **2011**, *54*(2), 519-21.
- 3. Maughan, E.; Webster, C.; Konig, T., and Renfrew, I. Endovascular management of renal artery aneurysm rupture in pregnancy: A case report. *International Journal of Surgery Case Reports*. **2015**, *12*, 41-43.
- 4. Prabalos, A-M.; Chen, H. H.; Rodis, J. F.; Ruby, S., and Campbell, W. A. Angiographic Embolization of a Ruptured Renal Artery Aneurysm During Pregnancy. *Obstetrics & Gynecology*. **1997**, *90*(4), 663-5.
- 5. Hellmund, A.; Meyer, C.; Fingerhut, D.; Müller, S.C.; Merz, W.M., and Gembruch, U. Rupture of renal artery aneurysm during late pregnancy: Clinical features and diagnosis. *Arch. Gynecol. Obstet.* **2016**, *293*(3), 505-8.
- 6. Yadav, S.; Sharma, S.; Singh, P., and Nayak, B. Pregnancy with a rupture renal artery aneurysm: Management concerns and endovascular management. *BMJ Case Rep.* **2015**, 26.
- 7. Schulte, W.; Rodriguez-Davalos, M.; Lujic, M.; Scholsser, F., and Sumpio, B. Operative Management of Hilar Renal Artery Aneurysm in a Pregnant Patient. *Ann. Vasc. Dis.* **2015**, *8*(3): 242-5.
- 8. Soliman, K. B.; Shawky, Y.; Abbas, M. M.; Ammary, M., and Shaaban, A. Ruptured renal artery aneurysm during pregnancy, a clinical dilemma. *BMC Urology*. **2006**, *6*(22).
- 9. Ravari, H.; Vaatanchi, A.; Pournali, L.; Afarideg, M., and Dadgar, S. Renal artery aneurysm rupture during post-partum period: A case report. *Electronic Physician*. **2017**, *9*(8): 5138-41.
- 10. Siani, A.; Gabrielli, R.; Accrocca, F., and Marcucci, G. Successful covered stent-graft repair in symptomatic renal artery aneurysm early after childbirth. *Journal of Cardiovascular Surgery*. **2017**, *58*(1), 95-8.