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Case:
18 yo otherwise healthy G1P0 pregnant female at 6w2d by LMP presented to the emergency department with right lower quadrant abdominal pain that began acutely 5 hours prior to presentation. She described the pain as constant, sharp in nature, without radiation, with no change in location or quality since onset. Associated nausea, vomiting, and fever were present. She denied vaginal bleeding, vaginal discharge, dysuria, or diarrhea. On physical exam the patient was febrile to 38.3 (101), tachycardic to 110, respirations 18, blood pressure 132/82, 100% on room air. Abdominal exam revealed mild distress secondary to pain, exquisite tenderness to the RLQ at McBurney's point with voluntary guarding, no rebound tenderness or peritoneal signs. Bimanual exam was negative for CMT, adnexal tenderness, or masses.

Clinical Question:
What is the best recommended **imaging modality for suspected appendicitis in the pregnant** patient?

Evidence:
Ultrasound is considered the initial diagnostic imagining modality secondary to its ease, accessibility, and lack of radiation. However, it can be **difficult to perform at gestational ages over 35 weeks and can be less effective in patients with large body habitus**. Studies show a wide range of statistical variance of ultrasound when compared to the surgical pathology gold standard. Its sensitivity can range from **36% to 100%** and specificity from 33% to 99%.[1]
MRI, on the other hand, shows more narrowed ranges of statistical significance and is the second step in the diagnostic algorithm. It has the benefits, like ultrasound, of no ionizing radiation and a negative predictive value of 100%. When MRI is compared to the surgical pathology gold standard, its sensitivity can range from **80% to 100%** and specificity from 93-98%.[1]
CT scan, though contrary to popular belief, has recently been shown to be **safe in pregnancy** with radiation exposure only 300 mrad, well below the 5,000 mrad safety threshold.[2] The accuracy of this test is between **93% and 98%**.[3]

Conclusion:
Currently, based on the data, the algorithm for diagnosis of suspected appendicitis in the pregnant female would be to start with ultrasound, though could be deferred in those obese patients where penetrance would be limited or those over 35 weeks gestation. If negative in a strongly suggestive clinical picture, the next step would be MRI followed by CT scan.

References:
1. Thompson MM, Kudla AU, Chisholm CB. Appendicitis During Pregnancy with a Normal MRI. West J Emerg Med. Sep 2014; 15(6): 652-654.
2. Pastore PA, Loomis DM, Sauret J. Appendicitis in Pregnancy. J Am Board Fam Med. Nov-Dec 2006; 19(6): 621-626.
3. Old J, Dusing R, Yap W, Dirks J. Imaging for Suspected Appendicitis. Am Fam Phys 2005; 71: 71–8