



UNIVERSITY of  
**ROCHESTER**  
MEDICAL CENTER

UNIVERSITY OF ROCHESTER MEDICAL CENTER  
DEPARTMENT OF IMAGING SCIENCES

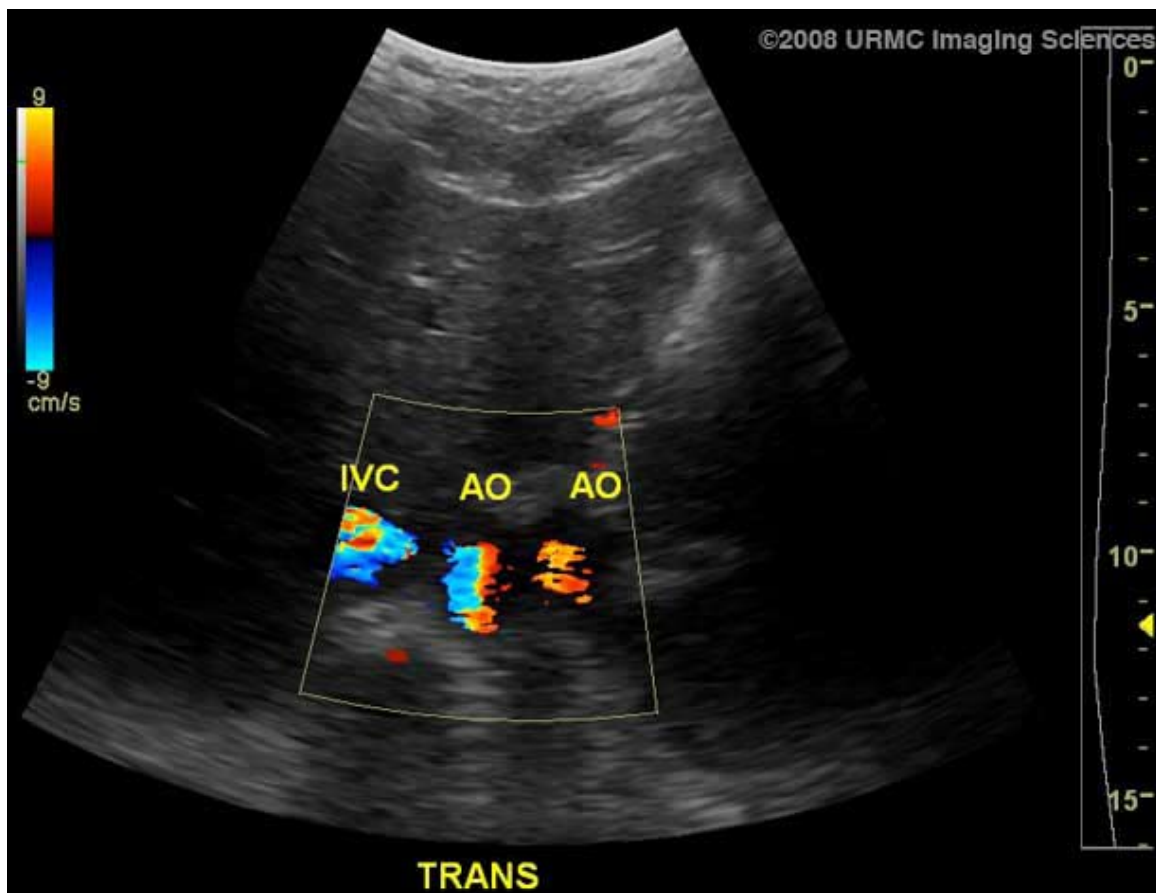
## Imaging Sciences Interesting Cases

### CASE 129

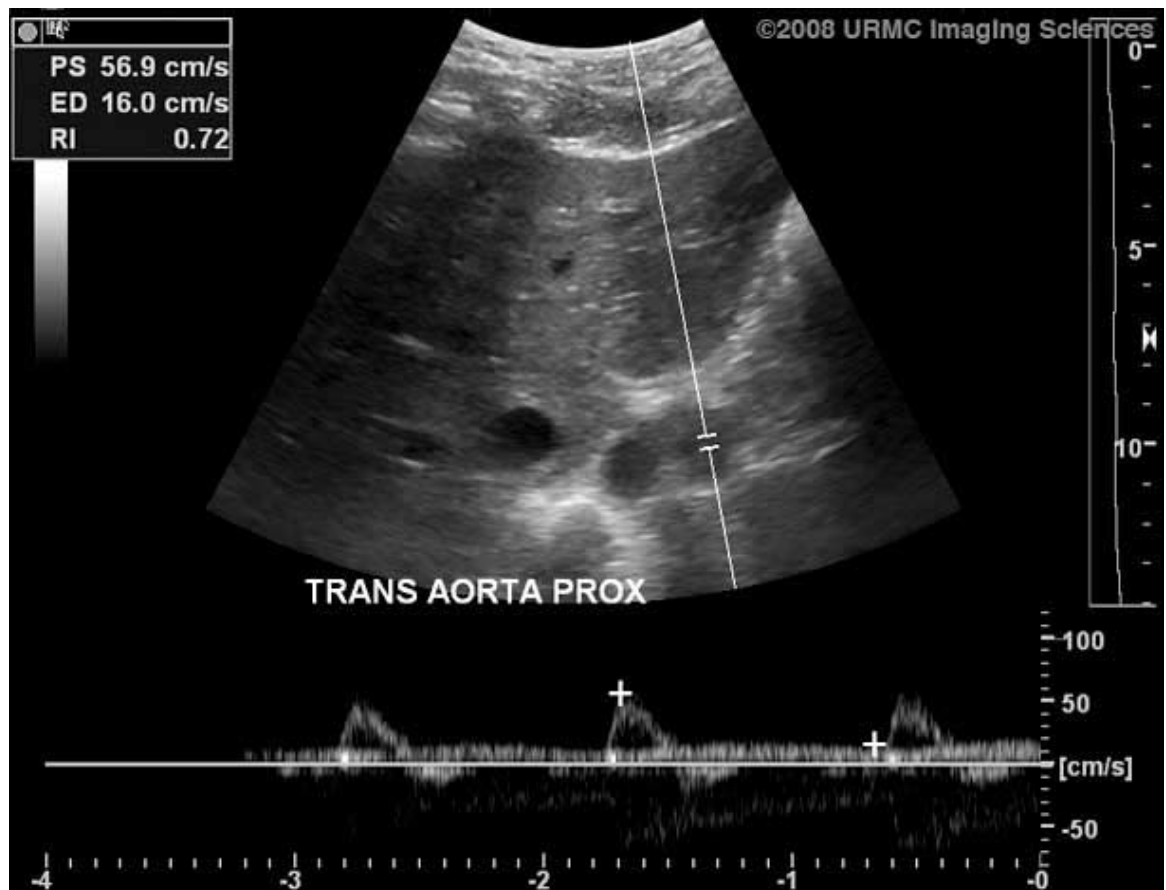
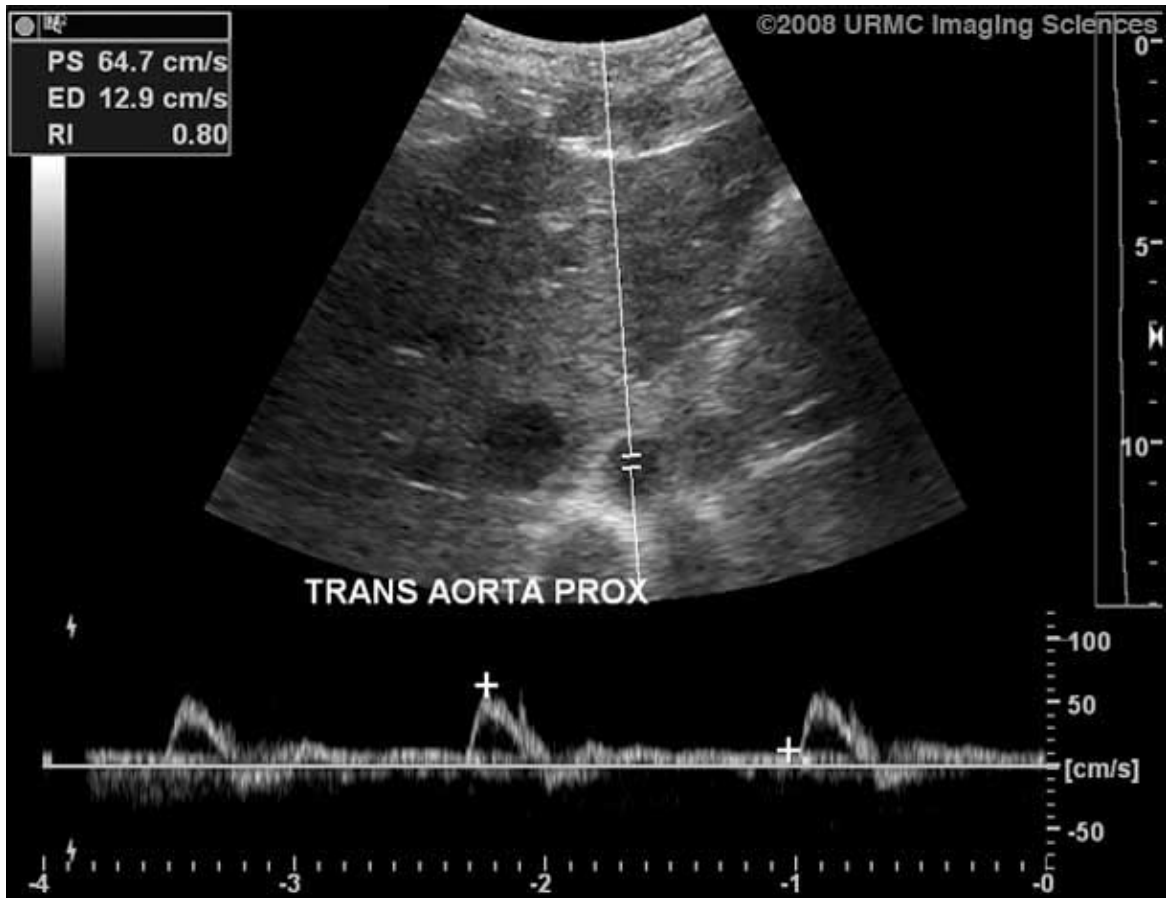
Nate Johnson, MD

**CLINICAL PRESENTATION:** A 21-year-old female had a renal ultrasound for proteinuria work-up.

**IMAGING FINDINGS:** (see below)



**Figure 1:** Transverse ultrasound image of the abdomen demonstrates “duplicated abdominal aorta.” Patient scanned from anterior abdomen at midline.



**Figures 2 & 3:** Both lumens demonstrate arterial waveforms.



**Figure 4:** Patient scanned from the right side demonstrates only one aorta and one IVC.

**DIAGNOSIS: Mirror image artifact**

**DISCUSSION:** Mirror image artifact is a common problem occurring in ultrasound imaging. It most commonly occurs from reflection of sound waves at large air surfaces. The air-soft tissue interface functions as a “mirror” by reflecting sound waves of high intensity. This reflection delays the time of return of information to the transducer, therefore misinterpreting structures as being deeper than they actually are. This frequently occurs at the interface between expanded lung and abdominal organs, causing apparent liver and/or splenic tissue above and below the diaphragm.

The refraction in our patient is likely not caused by an air-soft tissue interface, but rather the fat between the rectus abdominis muscles. There is a prism-shaped fatty region between the rectus abdominis muscles that causes a refraction of the beam as it enters the patient, and a second refraction from the returning echo. This causes the transducer to misinterpret the location of the structure. The finding of “duplicated abdominal aorta” was disproven when the patient was scanned in the right lateral decubitus position through the flank, which bypasses the anterior prism.

**REFERENCES:**

1. Vandeman FN, Meilstrup JW, Nealey PA. Acoustic prism causing sonographic duplication artifact in the upper abdomen. *Invest Radiol.* 1990 Jun;25(6):658-63. [PubMed]
2. Mandelstam SA, Brockley C. Aortic duplication artefact in a 14-year-old girl. *Pediatr Radiol.* 2004 Jun;34(6):508. [PubMed]
3. Brant WE, ed. *The Core Curriculum: Ultrasound.* Philadelphia: Lippincott Williams & Wilkins, 2001.