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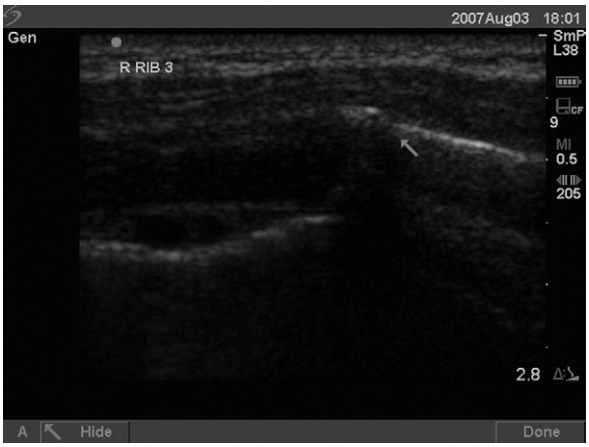

Figure 1. There is an approximately 1-cm step-off and anterior displacement of the hyperechoic (bright white) line.

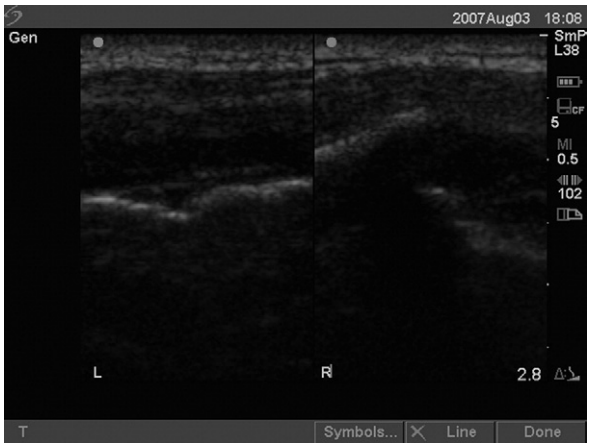

Figure 2. Normal left third rib. Compare with right third rib.

Figure 3. Subperiosteal hematoma. There is a hypoechoic (dark) collection surrounding the bone, consistent with blood. Used with permission of Marina DelRios, MD, MS, Department of Emergency Medicine, Emergency Ultrasound Division, St. Luke's/Roosevelt Hospital Center, New York, NY.

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A 31-year-old woman presented to the emergency department (ED) with right anterior chest wall pain. She fell off the handlebars of a bicycle 5 days before arrival and landed on her chest and face. She denied head or neck injury, chest pain, and shortness of breath. Her primary care physician referred her to the ED for concerns of rib fracture. Physical examination was unremarkable, except for focal swelling and tenderness without crepitance at the right anterior third rib adjacent to the sternal border.

For the diagnosis and teaching points, see page e2.
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DIAGNOSIS:

Fracture of the third rib. The ultrasonographic images were obtained with a high-frequency linear transducer. The images demonstrate an anteriorly displaced fracture of the third rib (Figures 1 and 2), with associated subperiosteal hematoma. Chest radiograph result was normal. Computed tomographic scan of the chest confirmed the fracture, without associated thoracic structure injuries. Rib fractures are the most common injuries resulting from blunt chest trauma. Up to 50% of rib fractures may be missed on standard radiograph,[1] and cartilaginous fractures may never be appreciated by radiograph.[2] A study by Griffith et al,[3] comparing the sensitivities of sonography and radiography for revealing acute rib fracture, found that sonography reveals more fractures (78%) than does radiography (12%) and will reveal fractures in most patients with suspected rib fractures. In addition, sonography has the advantage of avoiding ionizing radiation. Fracture of the rib with associated subperiosteal hematoma is the most common finding (Figure 3), followed by fracture of the rib alone and subperiosteal hematoma alone.[4]

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4. Kara M, Dikmen E, Erdal HH, et al. Disclosure of unnoticed rib fractures with the use of ultrasonography in minor blunt chest trauma. *Eur J Cardiothorac Surg*. 2003;24:608-613.