Wolfrum Method: An Innovative Approach To the Y-Shoulder Examination

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The Y-shoulder examination was first documented in 1974 in an article in *Radiology* by Rubin et al and was so named because the acromion and coracoid processes form obvious Y-shaped arms on the vertical body of the scapula.[1] Acquiring quality Y-shoulder examinations on patients with traumatic injuries who must remain in the recumbent position can be challenging for radiologic technologists.

Although digital imaging has presented with adaptive challenges, it also has presented with the potential for creativity. For example, digital image receptors allow for lower exposure factors, which can eliminate the need for a grid when imaging the shoulder joint. A non-grid approach allows for steep angulation of the central ray without grid cutoff.[2] Using this knowledge, Nicole Wolfrum, MA, R.T.(R)(CT), developed a method for imaging the recumbent trauma patient with a possible fracture or dislocation of the shoulder (see **Figure 1**). Her method warrants recognition and sharing with the medical imaging profession.

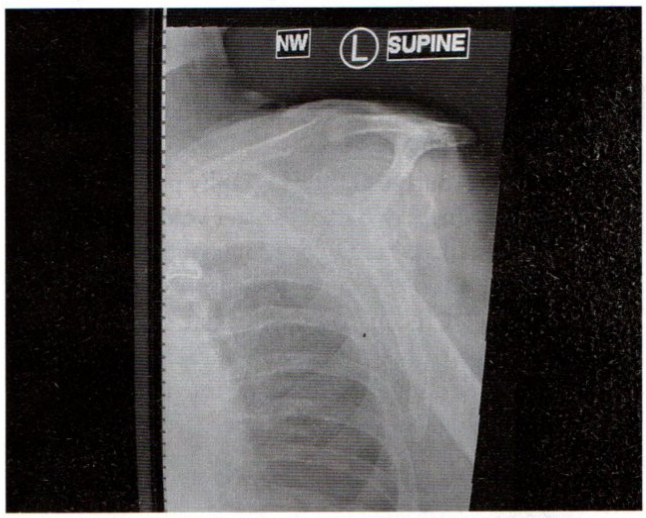

Figure 1. *A digital radiograph obtained using the Wolfrum method for recumbent Y-shoulder imaging. Image courtesy of Lehigh Valley Health Network. Poconos, East Stroudsburg, Pennsylvania.*

Performing the Wolfrum Method

To begin, the patient is positioned supine and recumbent (see **Figure 2**). The image receptor is placed posterior to the patient and centered on the patient's midline. The posterior surface of the shoulder to be imaged is lateral to the image receptor's midline. The arm on the affected side is positioned comfortably, lateral to the patient's torso.

Next, the x-ray tube is positioned lateral to the affected shoulder (see **Figure 3**). The central ray is angled medially toward the patient at an angle of 37° to 42°, with thinner patients requiring higher angulations. The central ray is aligned to the midpoint of the image receptor, entering the affected shoulder at the coracoid process. A distance of 40 inches from the tube to the image receptor is maintained, and the patient is instructed to suspend respiration during the exposure.

Conclusion

The Wolfrum method is an innovative method for performing the Y-shoulder examination that uses a

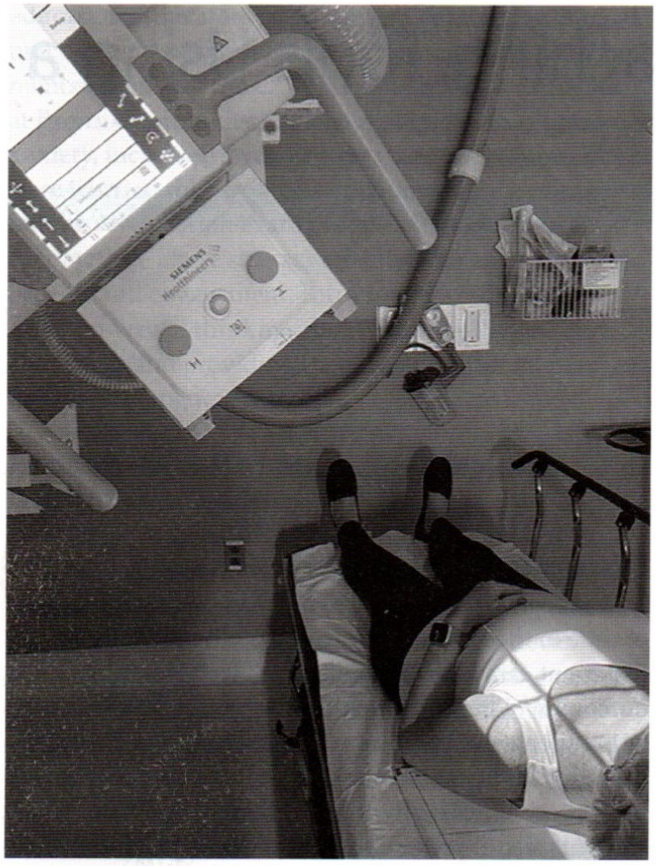

Figure 2. *Positioning of the image receptor and patient for a Y-shoulder examination using the Wolfrum method. Photo courtesy of the authors.*

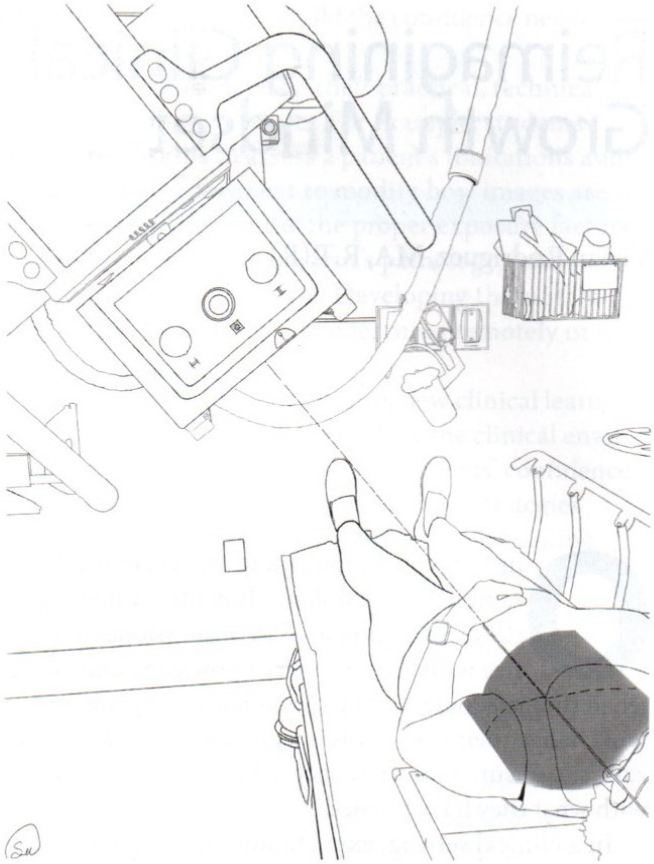

Figure 3. *Illustration depicting the central ray directed medial to the image receptor through the coracoid process at an angle of 37° to 42°. Illustration courtesy of Samantha Wolfrum.*

nongrid approach and steep angulation of the central ray, allowing an injured patient to recline during imaging. This method is more comfortable for patients and thus easier for technologists, while also producing excellent diagnostic images.

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Reference

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2. DeMaio DN, Herrmann T, Noble LB, et al. Best practices in digital radiography. Published June 14, 2018. Accessed September 2, 2023. https://www.asrt.org/docs/default-source/research/whitepapers/asrt12_bstpracdigradwhp_final.pdf?sfvrsn=743d0370_14