

A Simple Technique to Position the Image Intensifier During Anterolateral Approaches to Shoulder Surgery: The Sydney Harbour Bridge Position

Martin Richardson, MBBS, MS, FRACS, FAOrthA,* †
 Jarrad Stevens, MBBS, FRACS, FAOrthA, † and Tony Sobol, MBBS(hons) †

Summary: We describe a simple technique for positioning the image intensifier (II) during shoulder procedures that can both reduce II positioning time and decrease the risk of inadvertent decontamination of the equipment. For the shoulder surgeon who uses II while operating in the lateral position, this technical pearl is worth considering.

Key Words: image intensifier—shoulder—surgery.

(*Tech Orthop* 2017;00: 000–000)

BACKGROUND

The literature supports minimally invasive open reduction internal fixation via an anterolateral deltoid splitting approach as an established technique for treatment of proximal humeral fractures.^{1,2} Screw perforation of the humeral head is the most common complication of this procedure.³ Konigshausen et al⁴ reported that nearly half (42%) of their study's complications were attributed to screw perforation of the humeral head



FIGURE 1. Anteroposterior II shot humerus fixation.



FIGURE 2. Screenshot live screen humerus fixation.

demonstrating the vital importance of good quality intra-operative imaging provided by an image intensifier (II). We present an alternative technique to position the II where adequate anteroposterior, lateral, and live screen II shots can be obtained in the lateral position while allowing the surgeon to work without interference from the machine (Figs. 1, 2).



FIGURE 3. Initial set-up of the II machine in the Sydney harbour bridge position with arm rotated to 45 degrees seen from the side.

From the *Department of Surgery, University of Melbourne; and †Epworth HealthCare Musculoskeletal Clinical Institute, Vic., Australia. The authors declare that they have nothing to disclose.

For reprint requests, or additional information and guidance on the techniques described in the article, please contact Jarrad Stevens, MBBS, FRACS, FAOrthA, at drjarradstevens@hotmail.com or by mail at Epworth HealthCare Musculoskeletal Clinical Institute, Vic., 3121, Australia. You may inquire whether the author(s) will agree to phone conferences and/or visits regarding these techniques. Copyright © 2017 Wolters Kluwer Health, Inc. All rights reserved.



FIGURE 4. View of II set-up from the head end of the patient. [full color online](#)



FIGURE 7. Operating with the draped II machine. [full color online](#)



FIGURE 5. Draping the patient with the II machine in position. [full color online](#)



FIGURE 6. Both patient and II machine draped—room available to operate. [full color online](#)



FIGURE 8. Operating in the lateral position with II machine in Sydney harbour bridge position with II screen in view. [full color online](#)

TECHNIQUE

Positioning the patient in the lateral position with 10 to 15 lbs (4.5 to 7 kg) traction will help reduce the fracture fragments and allow easy access to undertake the anterolateral deltoid splitting approach. The use of II is essential to visualize fracture reduction and screw placement. The standard “under table” II position for this procedure is for the most part effective; however, it is the authors experience that if he drapes the II in the “Sydney harbour bridge” configuration (Figs. 1, 2) the required shots are easy to obtain, the machine is maneuvered in and out of position without additional concerns of sterility and can reduce operative time experienced with under the table machine positioning during cases set-up in the lateral position.

To drape the C-arm of the II a standard dedicated sterile plastic sheath is applied to both the emitter and receiver. The central bar is draped with a large sterile green drape and held in place with towel clips (Fig. 3). The C-arm can now be tilted away from the surgeon by 45 degrees for ease of operating. When the machine is required to be moved for further access it is simply sent further distally or raised and backed out. The



FIGURE 9. Room for the surgeon with the anesthetic team in the background. full color online

need for swinging the C-arm under the table with redraping of the unsterile end is eliminated. The anesthetic team also prefer this position for ongoing ability to monitor lines and intubation devices without obstruction.

Pitfalls: this is ideal for anteroposterior and lateral II shots, as necessary in fracture surgery; however, axillary views are not able to be achieved with this II set-up. The ability to obtain axillary views is seldom needed but would require a different II configuration and redraping. The theater space available would also need to be adequate for II and the imaging screen (Fig. 4).

Operating with II in the Sydney harbour bridge position is shown in Figures 5–9.

DISCUSSION

This is an alternative technique that allows intraoperative II use during shoulder procedures such as fracture fixation and can reduce II positioning time and potentially decreases the risk of inadvertent decontamination of the equipment. We have not found the axillary view a requirement in management of proximal humerus fractures as the reduction and screw penetration is visualized adequately by internal and external rotation of the humerus at the time of fixation. If this view is thought needed for the purpose of the operation, beach chair position for the patient instead of lateral should be considered before draping. For the shoulder surgeon who uses II while operating in the lateral position, this technical pearl is worth considering.

REFERENCES

1. Gardner MJ, Boraiah S, Helfet DL, et al. The anterolateral acromial approach for fractures of the proximal humerus. *J Orthop Trauma*. 2008;22:132–137.
2. Hettrich CM, Paul O, Neviasser AS, et al. The anterolateral approach to the proximal humerus for nonunions and delayed unions. *Int J Shoulder Surg*. 2011;5:21–25.
3. Berkes M, Little M, Lorich D. Open reduction internal fixation of proximal humerus fractures. *Curr Rev Musculoskelet Med*. 2013;6:47–56.
4. Konigshausen M, Kubler L, Godry H, et al. Clinical outcome and complications using a polyaxial locking plate in the treatment of displaced proximal humerus fractures. A reliable system? *Injury*. 2012;43:223–231.