

## A SURVEY TO STUDY THE PRACTICE OF REQUESTING FOR CHECK X-RAY AFTER HIP FRACTURE SURGERY

S Dhakal<sup>1</sup>, RG Battad<sup>2</sup>

<sup>1</sup>Department of Orthopedics, Chitwan Medical College, Chitwan Medical College (P) Ltd, Bharatpur-10, Chitwan, Nepal.

<sup>2</sup>Department of Orthopedics, East Avenue Medical Center, East Avenue, Quezon City, Philippines.

**Correspondence:** Dr. Shankar Dhakal MS, Chitwan Medical College, Chitwan Medical College (P) Ltd, Bharatpur-10, Chitwan, Nepal.  
e-mail [dhakalshankar1@gmail.com](mailto:dhakalshankar1@gmail.com)

### ABSTRACT

The purpose of this study was to determine the practice of requesting for check x-ray after hip fracture surgery. This is a Cross-sectional study. Questionnaires were sent to POA FELLOWS, data collected, and results were analyzed. Most of the respondents used intra-operative radiography for DCS/DHS and CS fixations but all of them requested for check x-ray routinely on all kinds of hip fracture surgery viz: hip hemiarthroplasty, DCS/DHS, CS fixations. Study also showed that there was consensus among most of them for routine check x-ray. This study showed routine practice of check x-ray after hip fracture surgery locally, which is a significant finding, since this is contrary to the recent studies done abroad indicating postoperative radiograph is not necessary unless there are operative concerns.

**Keywords:** Check x-ray, Hip fracture, Image intensifier.

### INTRODUCTION

To the health care system and to society in general, hip fracture represents an epidemic disease in the elderly population<sup>7</sup>. This is the most common fracture found in the above said age group, and, as our population ages, this number is rising (NHS Scotland. Scottish hip fracture audit 2004). Except for some reserved cases, treatment usually is surgery and obviously hip fracture surgery is one of the common procedures in orthopedic practice<sup>7</sup>.

There is still much debate on the appropriateness of taking postoperative radiographs following hip fracture surgery<sup>4</sup>. The use of image intensification systems is now common place and necessary for many operative orthopedic procedures<sup>2</sup>. With the exception of hemi and total arthroplasties, image intensifier guidance is commonly employed throughout the procedure to ensure an accurate reduction and placement of the fixation device. Modern systems provide high quality images with the ability to produce hard copies once fixation has been achieved. However, in the postoperative period, it is not uncommon for a departmental x-ray to be performed to ensure accurate position of the fixation device; the so called "check x-ray"<sup>1</sup>.

Lots of researches have been done abroad on their practices in requesting for check x-ray, and therefore, we decided to conduct our own, among our POA FELLOWS, to know the local trend.

### MATERIAL AND METHODS

This is a cross-sectional study conducted among our POA Fellows by sending the pre-trialed questionnaire. Initially, a set of pertinent questions were formulated, and these were floated among few Fellows. Then questions were revised accordingly for final trial. To lessen the bias, those Fellows that participated in the pre-trial were excluded from the final trial. To bring uniformity among the respondents, only those who are Philippine Orthopedic Association Fellows were given the questionnaire.

We plan to send the questionnaire to as much POA Fellows as possible throughout the country via e-mail in a bid to come up with a strong study and also to look for the response rate as well. Inline with this, we have started out our study among Fellows associated with few major PBO ACCREDITED TRAINING INSTITUTE here in manila and thus the result, that follows here, are preliminary. In this way, we have hoped that should there be further need for refinement in the questionnaire, this will give ample opportunity before we go nationwide.

### RESULTS

A Total of 41 respondents from 4 different institutes in manila participated. Respondents were in practice from 2 years to some more than even 50 years. Likewise, number of cases done, like that of hip fracture surgery in a year, were from 12

to as high as 144. All of the respondents were practicing in a highly urbanized area in tertiary trauma centers. As shown in Table 1, almost all cases of DCS/DHS (95%) and cannulated screw (98%) were done using either intraoperative c-arm or x-ray, while very few used the intra-op radiography for hemiarthroplasty (7%). Interestingly, all the fellows asked for check x-ray for all the above mentioned procedures, despite of intra-op radiograph.

**Table 1: Results of the Questionnaire**

Operative procedures	Fellows using intra-op c-arm/ x-ray (%)	Fellows requesting for post-op x-ray (%)
Hip hemiarthroplasty	7	100
DCS/DHS	95	100
CS fixation	98	100

DCS, dynamic condylar screw; DHS, dynamic hip screw; CS, cannulated screw

Table 2 depicts the reasons for requesting post operative x-ray. Most of the respondents (95%) wanted check x-ray for both documentation and reduction and stability evaluation purposes.

**Table 2: Reasons for requesting post-op x-ray**

Documentation	5%
Reduction and stability evaluation	-
Both	95%

## DISCUSSION

The use of an image intensifier during fixation of hip fractures is indispensable. It not only gives a high resolution real time image but static images can be captured and retained as hard copy for later use<sup>5</sup>. Hence, satisfactory fracture reduction and implant positioning during DHS/DCS, CS fixation necessitates the use of image intensification in theaters. Stability of the prosthesis following a hemiarthroplasty is assessed intraoperatively<sup>4</sup>.

Previous studies have suggested that check x-rays do not influence the management of patients who have undergone operative fixation of fractured neck of femurs under image intensifier guidance<sup>1</sup>. Thermal prints were found to be deficient in some areas but, nevertheless, can potentially replace postoperative radiographs in many orthopedic procedures<sup>6</sup>. Routine check radiographs after DHS fixation is unnecessary provided adequate image intensifier images are obtained at the time of surgery<sup>3</sup>. Likewise, routine post-operative radiographs after femoral neck fracture fixation are unnecessary as well, unless there is some clinical indication. This has significant implications in relation to patient discomfort, radiation exposure and cost effectiveness<sup>5</sup>. And any investigation that will not aid or alter future management should not be

undertaken. An x-ray is no exception to this rule. Our study has shown that all of the currently practicing Fellows that responded to the questionnaire have been routinely asking for check x-ray despite having intra-op radiography. This finding is somewhat similar to other studies done abroad, like as mentioned in the study by J chakravarthy et al, wherein they have noted that more than 50% of all consultants still request for postoperative radiographs following DHS and CS in their work place. However, in our case, ALL of the consultants asked for check x-ray. This practice is in sharp contrast to what have been proven on the said topic elsewhere. Similarly, most of our Fellows have consensus on asking for check x-ray for documentation and verification for reduction and stability of fracture fragments, but again, as shown by previous studies just mentioned above, this is not necessary and hence cannot be justified.

The use of radiological investigations is an accepted area of medical practice, justified in terms of clear clinical benefits to the patient, outweighing the small radiation risks. However, diagnostic medical radiation adds approximately one sixth to the population dose from background radiation. One recognized way of reducing this is to avoid repeat x-rays. Combined, an antero-posterior (AP) and lateral hip x-rays exposes the patient to 0.8 mSv, equivalent to 40 chest x-rays or 8 months of background radiation. If an x-ray is not influencing management then this is radiation that should be avoided<sup>1</sup>. Besides the cost of radiography, obtaining a postoperative film place a significant demand on already stretched hospital resources. Ward staff and porters accompany the patient to the radiology department, and time spent there could have been utilized in some other more important stuffs. Of even greater concern is the discomfort experienced by the patient in moving from the ward to the radiology department; transfer onto and off the table and back to the ward<sup>4</sup>.

Nevertheless, the check x-ray does have a role to play in the management of patients with a fractured neck of femur. In those who undergo arthroplasty, intra-operative imaging is not routinely used. The check x-ray is therefore a necessary component of the postoperative management to ensure the prosthesis is reduced. Furthermore, in procedures where there is doubt regarding the accuracy of reduction, fixation or intra-operative imaging, the check x-ray remains an essential part of postoperative care.

## CONCLUSION

Our findings show that despite of having intra-operative radiography for DCS/DHS and CS fixation, check x-ray are routinely ordered. And, there is consensus among most of the respondents on requesting for check x-ray. Reasons behind this could be the quality of intra-operative radiography that has been in the use, although modern image intensifiers are not new thing in private medical centers here. Others might want check radiography for medico-legal purposes, and still others for follow up etc., although these two are taken as a very weak reason without much justification<sup>4</sup>. This study is first of

a kind on the above mentioned topic and we plan to cover the whole country in the next round, which will, then, give the better and overall picture of current trend among our Fellows. Although these results are preliminary, they are significant in terms of showing the general trend locally in asking for routine check x-ray, which seems otherwise from what has been proven in studies elsewhere. This is a cross-sectional study; hence it comes with all the inherent weaknesses of a survey type of study like some of the data on epidemiologic aspect were not filled up by the respondents. Also, survey barely answers the reason(s) behind some particular findings, lthough we added some pertinent questions to counter that. Since, this is a preliminary report, we haven't reported any response rate as yet, but we do plan to include that on our final results.

## REFERENCES

1. Cooney AD, Campbell AC. Do check x-rays influence the management of patients who have undergone hip fracture fixation using image intensifier guidance? *Injury, Int. J. care Injured.* 2006; 37: 763-767.
2. Haddad FS, Williams RL and Prendergast CM. The check x-ray: an unnecessary investigation after hip fracture fixation? *Injury.* 1996; 27(5):351-352.
3. Kurup HV, Michael ALR, Beaumont AR. Do We Need Postoperative Radiographs After Hip Fracture Fixation? *J Orthopaedics.* 2006; 3 (3):10.
4. Chakravarthy J, Mangat K, Qureshi A, Porter K. Postoperative radiographs following hip fracture surgery. Do they influence patient management? *Int J Clin Pract.* 2007; 61(3):421-424.
5. Mohanty K, Gupta SK, Evans RM. Check radiography after fixation of hip fractures: is it necessary? *J R Coll Surg Edinb.* 2000 Dec; 45(6): 398-399.
6. Pattison RM, Calzada S, Koka SR, James SE. Postoperative radiographs or thermal prints after internal fixation of fractures? A study of DHS fixation of hip fractures. *Ann R Coll Surg Engl.* 1996 Nov; 78(6): 509-511.
7. Robert W, Bucholz MD, James D, Heckman MD. Fractures in adults. 2001; 38: 1579-1627.