



ELBOW JOINT RADIOGRAPHY EXAMINATION PROCEDURE IN POST OPEN REDUCTION INTERNAL FIXATION CASES IN THE RADIOLOGY INSTALLATION OF KENDAL DISTRICT HOSPITAL

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Received: written by the editor; Revised: written by the editor; Accepted: written by the editor
(date of submission, 10pt)

ABSTRACT

Background: The elbow joint is the joint between the humerus and radioulna. One of the disorders that occurs in the musculoskeletal system is a fracture. A fracture is an event that breaks the continuity of bone tissue. One action that can be taken to treat bone fractures is surgery, open reduction internal fixation. One of the supporting examinations to see the condition of the bones after the open reduction internal fixation procedure is a radiological examination with conventional radiography. The aim of this research is to determine the procedure for radiographic examination of elbow joints in cases of post open reduction internal fixation in the Radiology Installation of Kendal District Hospital. **Method:** This type of research is descriptive qualitative with a case study approach. **Result:** The research results obtained were that the radiographic examination procedure for the elbow joint in post open reduction internal fixation cases did not require any special patient preparation, the patient was only asked to remove objects in the elbow joint area to be examined so that they do not interfere with the radiographic results, such as elastic bandage locks. Tools and materials used in the examination include an x-ray machines, examination table, imaging plate measuring 18x24 cm, a chair for the patient to sit in and a computed radiography device. The projections used are anteroposterior projection and lateral projection. **Conclusion:** The procedure for radiographic examination of the elbow joint at the Radiology Installation of Kendal District Hospital is in accordance with the literature and is considered to be able to confirm the diagnosis.

Keywords: elbow joint radiography; post open reduction internal fixation

Introduction

The elbow joint is a musculoskeletal system which is usually called the elbow joint, cubiti or articulatio cubiti. The elbow joint is the joint between the humerus and radioulna. The elbow joint is a combination of a saddle joint and a pivot joint. The saddle joint is located between the humerus and the radius of the ulna, while the pivot joint is located between the radius of the ulna. The elbow joint is a complex joint consisting of 3 bones, 3 ligaments, 2 joints and 1 capsule. The elbow joint allows flexion and extension movements due to the presence of a synovial hinge joint formed from the humeroulnar joint and humeroradial joint, thus allowing the joint to move freely¹⁻⁵. The joint capsule at the elbow encloses 3 articulations. The 2 articulations are uniaxial hinge joints that allow flexion and extension of the forearm. 1 other articulation is a pivot joint that allows pronation and supination movements of the forearm⁶.

One of the disorders that occurs in the musculoskeletal system is a fracture. Fracture is an event where the continuity of bone tissue is broken⁷. Fracture is a broken bone caused by trauma⁸. One action that can be taken to treat a fracture so that it can be restored or repaired is surgery. Operations carried out using open surgery are usually called open reduction internal fixation or abbreviated as ORIF. Open reduction internal fixation is an open surgical procedure performed on the part of the body that has a broken bone by inserting a pin or screw into the body with the aim of providing fixation and immobilization of the broken bone⁹.

One of the supporting examinations to see the condition of the bones after the open reduction internal fixation procedure is a radiological examination with conventional radiography. Radiographic examination of the elbow joint in post open reduction internal fixation cases at the Radiology Installation of Kendal District Hospital using anteroposterior and lateral projections.

The basic projections used for radiographic examination of the elbow joint according to the basic radiography book are anteroposterior, lateral (lateromedial), anteroposterior oblique medial rotation and anteroposterior oblique lateral rotation^{1,10}. The projections for radiographic examination of the elbow joint according to the latest pocket book are anteroposterior and lateral¹¹. Meanwhile, the projection used in radiographic examination of elbow joints in cases of fracture post open reduction internal fixation at the Radiology Installation of Arifin Achmad Hospital, Riau Province is anteroposterior with an angle of 5° caudal and lateral perpendicular¹².

Based on the above background, the author is interested in studying further regarding elbow joint radiographic examination procedures in post open reduction internal fixation cases at the Radiology Installation of Kendal District Hospital.

Methods

This type of research is descriptive qualitative research with a case study approach which is used to systematically and accurately describe the original situation regarding elbow joint radiographic examination procedures in post open reduction internal fixation cases in the Radiology Installation of Kendal District Hospital. The research subjects used in this study were patients with post open reduction internal fixation cases.

Results and Discussion

Illustration of a radiographic examination of the elbow joint in a post open reduction internal fixation case at the Radiology Installation of Kendal District Hospital

On September 14 2023, a female patient named Mrs. WN 26 year old came to the Radiology Installation at Kendal District

Hospital with a request for an anteroposterior and lateral right elbow joint examination.

Procedure for radiographic examination of the elbow joint in cases of post open reduction internal fixation at the Radiology Installation of Kendal District Hospital

Based on the research data obtained, for radiographic examination of the elbow joint in post open reduction internal fixation cases at the Radiology Installation of Kendal District Hospital there is no special patient preparation, the patient is only asked to remove metal objects in the elbow joint area which can interfere with the radiographic image such as keys elastic bandage. The preparation of tools and materials used is an x-ray machines, examination table, imaging plate measuring 18x24 cm, a chair for the patient to sit and a computed radiography device.



Figure 1. X-Ray Machines in the Radiology Installation of Kendal District Hospital



Figure 2. Imaging Plate in the Radiology Installation of Kendal District Hospital



Figure 3. Computed Radiography Devices (Computer and Reader) in the Radiology Installation of Kendal District Hospital



Figure 4. Computed Radiography Device (Printer) in the Radiology Installation of Kendal District Hospital

Radiographic examination of the elbow joint in post open reduction internal fixation cases at the Radiology Installation of Kendal District Hospital using anteroposterior and lateral projections.

In the anteroposterior projection, the patient is positioned sitting on an examination chair with the arms placed on the examination table. The upper limit of the cassette is at the distal 1/3 of the humerus, the lower limit of the cassette is at the proximal 1/3 of the antebrachii, the central ray is vertical perpendicular to the imaging plate, the central point is in the middle of the elbow joint, focus film distance 100 cm, 58 kV, 8.00 mAs and exposure performed while the patient is does not move. The results of the elbow joint radiograph in the case of post open reduction internal fixation with an anteroposterior projection are shown in figure 5.



Figure 5. Elbow Joint Radiograph Anteroposterior Projection Mrs. WN

In the lateral projection, the patient is positioned sitting on an examination chair with the arm placed on the examination table in a flexed position. The upper limit of the cassette is at the distal 1/3 of the humerus, the lower limit of the cassette is at the proximal

1/3 of the antebrachii, the central ray is vertical perpendicular to the imaging plate, the central point is in the middle of the elbow joint, focus film distance 100 cm, 58 kV, 8.00 mAs and exposure performed while the patient is still and does not move. The results of the elbow joint radiograph in the case of post open reduction internal fixation in the lateral projection are shown in the figure 6.



Figure 6. Elbow Joint Radiograph Lateral Projection Mrs. WN

Based on the literature obtained by the author, the elbow joint radiographic examination procedure does not require special patient preparation, the patient is only asked to remove objects that could interfere with the radiographic image of the organ being examined. For preparation, the tools and materials used include an x-ray plane, image receptor measuring 18x24 cm, marker, lead and processing unit¹³.

The elbow joint radiographic examination projections used are anteroposterior, lateral (lateromedial), anteroposterior oblique medial rotation and anteroposterior oblique lateral rotation projections¹. Meanwhile, according to the latest pocket book, the elbow joint

radiographic projections used are anteroposterior and lateral projections ¹¹.

The author have opinion that the procedure for radiographic examination of the elbow joint in post open reduction internal fixation cases carried out at the Radiology Installation of the Kendal District Hospital is in accordance with literature, namely that there is no special patient preparation, the patient is only asked to remove objects in the elbow joint area to be examined so that they do not interfere with the radiograph results, the tools and materials used are digital, including using an x-ray machines, an 18x24 cm imaging plate and a computed radiography device. The basic projections used are anteroposterior projection and lateral projection.

Conclusion

The elbow joint radiographic examination procedure in post open reduction internal fixation cases at the Kendal District Hospital Radiology Installation is in accordance with literature, both in terms of patient preparation, preparation of tools and materials, projection and radiographic techniques used, the examination procedure used is considered to be able to confirm diagnosis.

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