



## COMPARISON OF THE RESULTS OF GLENOHUMERAL JOINT RADIOGRAPH IMAGES DESCRIPTION ON AP OBLIQUE WITH 15<sup>0</sup>, 25<sup>0</sup>, 30<sup>0</sup> AND HORIZONTAL ANGULAR BEAM

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### Abstract

Glenohumeral joint is the broadest joint in our body. Glenohumeral joints bullet includes joint with very shallow bowls. The examination technique to see the glenohumeral joint is with the AP position, RPO and LPO formed the Oblique patient position with 15<sup>0</sup>, 25<sup>0</sup>, 30<sup>0</sup> and horizontal angular beam. This comparison research is to know the results of Glenohumeral Joint Radiograph Oblique images on AP with of 15<sup>0</sup>, 25<sup>0</sup>, 30<sup>0</sup> and angular horizontal beam at the Radiology Installation of Ulin Banjarmasin Hospital. This research is a descriptive quantitative design. Data were collected by observation and by analysing results of questionnaires that were distributed to 20 respondents to see the results of comparison Glenohumeral Joint Radiograph on AP Oblique images with of 15<sup>0</sup>, 25<sup>0</sup>, 30<sup>0</sup> and angular horizontal beam at the Radiology Installation of Ulin Banjarmasin Hospital. Using a horizontal beam angular direction is better because the joint gap between the head of the humerus and the glenoid fossa is completely open and there is a very clear image of the glenoid fossa. There are differences in the Glenohumeral Joint on AP Oblique radiographs with 15<sup>0</sup>, 25<sup>0</sup>, 30<sup>0</sup> and horizontal angular beam. The examination with the position AP AP Oblique Oblique position using the horizontal direction ray shows an image of the glenohumeral joint for a more informative result.

**Keywords:** *Glenohumeral joint, AP Oblique, Radiograph*

### 1. Introduction

Professional technologist must know, understand and master the basics of correct radiographic techniques. The basic techniques of radiographic question are about position of the patients and the objects, as well as the projected image during the examination. One of the examples is the examination of shoulder joint. A shoulder joint is a complex joint made up of several joints which are glenohumeral joint, acromioclavicular joint, sternoclavicular joint, and scapulothoracalis joint with the movement of interdependence with one another (Wibowo, 2009).

*Glenohumeral joint* is the most comprehensive motion joint in our body.

Glenohumeral joint includes bullet joints and joints with a very shallow bowl. Glenohumeral joints are formed by the humeral head round and glenoidaliscapula shallow cavity and pear-shaped. Joint surface is covered with hyaline cartilage, and glenoid cavity is deepened by the labrum glenoidale (Snell, 1997). This joint has three degrees of freedom which enable them to move in three planes of motion (Suhastika, 2015). Movements which can be done by the glenohumeral joint are flexion, extension, abduction, eksorotasi, endorotasi, and circumduction (Snell, 2000).

One problem that can occur in the joints is that a Glenohumeral Joint can lose active and passive mobility. It is Insidious (unintelligible occurrences) and progressive as a result of the joint capsule contracture. The prevalence of this disease is approximately 2% of the general

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population and 10-29% of diabetics in the United States (Kurniasih, 2011), and the American Academy of Orthopedic Surgeons describes prevalence shoulder pain reaches 50% of the general population. Research from Luine, et al in Kennedy, et al (2006) shows the increase of the number of people's experiencing shoulder joint complaint by an average of 6.9% to 26%, which increased every 1 month on average by 18.6% up to 31 %, rising 4.7% to 46.7% annually, and the average increase for several years by 6.7% to 66.7%. Global trade association mentioned the shoulder injury each day (Setiyawati et al, 2013).

According to Ballinger (1995), examination of the shoulder joint to see the image of the glenohumeral joint is composed of examination techniques to position the AP with the patient's shoulder attached to the cassette with the patient back to the bucky stand, position RPO with the patient's shoulder attached to the cassette, but the shoulders of patients left skewed fore thus forming Oblique patient positioning, and LPO with tape attached to the patient's shoulder, but the right of the patient's shoulder skewed forward, forming a patient positioning Oblique direction on 15°, 25°, 30° and horizontally beam.

Based on the description above, it is necessary to furtherly analyze regarding the comparison of the results of the Glenohumeral Joint Radiographs photo illustration AP Oblique direction on 15°, 25°, 30° and horizontally beam at the Radiology Installation of Ulin Banjarmasin Hospital.

## 2. Method

This research is descriptive quantitative, conducted in May 2018. The collection of data was done by observing, conducting direct examination process Glenohumeral Joint using variation on 15°, 25°, 30° and horizontal cranially at the position AP Oblique, and analyzing the results of questionnaires distributed to 20 respondents to compare the results of the Glenohumeral Joint Radiographs photo illustration AP Oblique direction on 15°, 25°, 30° and horizontal beam at the Radiology Installation of Ulin Banjarmasin Hospital.

## 3. Results and Discussion

### a. Glenohumeral Joint Inspection Techniques AP Oblique position with Directions Rays Horizontal (Image 1)

- 1) Patient position: AP Oblique erect in front of the stand bucky
- 2) Position Object: Glenohumeral Joint position in mid-cassette
- 3) *Central Ray*: Set 0o to the shoulder joint
- 4) *Central Point*: At a median Shoulder joint
- 5) FFD: 100 cm
- 6) Kv: 78 Kv
- 7) mA & s: 200 mA and 28 s



**Image 1.** Results of Joint Position Overview Glenohumeral AP radiograph with Directions Rays Horizontal Oblique (Source: Hospital Ulin Banjarmasin)

- 8) Criteria description:
  - a) a very clear image of the Glenohumeral Joint .
  - b) a very clear image of the shape of the glenoid fossa.
  - c) Os image showing clavicula superposition with the superior part of the os scapula.
  - d) Major shows images in the anterior tubercle of the humerus
  - e) a very clear image of the head of the humerus.

### b. Glenohumeral Joint Inspection Techniques AP Oblique position with Directions Rays 15° (Image 2)

- 1) Patient position: AP Oblique erect in front of the stand bucky
- 2) Position Object: Glenohumeral Joint position in mid-cassette
- 3) *Central Ray* : Set 15° cranially toward the shoulder joint

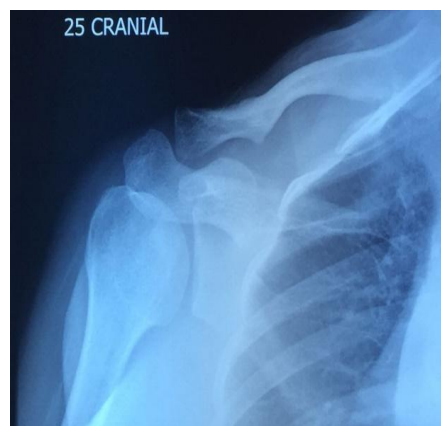
- 4) *Central Point* : On *Shoulder joint median*
- 5) FFD: 100 cm
- 6) Kv: 78 Kv
- 7) mA & s: 200 mA and 28 s



**Image 2.** Results of Joint Position Overview Glenohumeral AP radiograph with Directions Rays 15° Oblique (Source: Hospital Ulin Banjarmasin)

- 8) Criteria description:
  - a) a very clear image of the Glenohumeral Joint .
  - b) images form the glenoid fossa.
  - c) Os clavícula showing images in the form of simestris.
  - d) Major shows images in the anterior tubercle of the humerus
  - e) Os scapula showing images overlap with the acromion.
- c. Glenohumeral Joint Inspection Techniques AP Oblique position with Directions Rays 25° (Image 3)
  - 1) Patient position: *AP Oblique erect* in front of the stand bucky
  - 2) Position Object: Glenohumeral Joint position in mid-cassette
  - 3) *Central Ray* : Set 25° cranially toward the shoulder joint
  - 4) *Central Point* : On *Shoulder joint median*
  - 5) FFD: 100 cm
  - 6) Kv: 78 Kv
  - 7) mA & s: 200 mA and 28 s
  - 8) Criteria Overview:
    - a) a very clear image of the Glenohumeral Joint .
    - b) images form the glenoid fossa.

- c) Os clavícula showing images in the form of simestris.
- d) Caput humerus image showing a little superposition with the acromion
- e) images overlap with acromion



coracoid processus.

**Image 3.** Results of Joint Position Overview Glenohumeral AP radiograph with Directions Rays 25° Oblique (Source: Hospital Ulin Banjarmasin)

- d. Glenohumeral Joint Inspection Techniques AP Oblique position with Directions Rays 30° cranially (Image 4)
  - 1) Patient position: *AP Oblique erect* in front of the stand bucky
  - 2) Position Object: Glenohumeral Joint position in mid-cassette
  - 3) *Central Ray* : Set 30° cranially toward the shoulder joint
  - 4) *Central Point* : On *Shoulder joint median*
  - 5) FFD: 100 cm
  - 6) Kv: 78 Kv
  - 7) mA & s: 200 mA & 28 s
  - 8) Criteria description:
    - a) a very clear image of the Glenohumeral Joint .
    - b) The glenoid fossa shape image showing a little overlap with os Scapula lateral section.
    - c) Os clavícula showing images in the form of simestris.
    - d) Caput humerus showing images of superposition with the acromion.
    - e) Os scapula showing images overlap with the acromion.



**Image 4.** Results of Joint Position Overview Glenohumeral AP radiograph with Directions Rays 30° Oblique cranially (Source: Hospital Ulin Banjarmasin)

The questionnaire distributed to 20 respondents, two of them are doctors, show an average value of 3.47 on the results of the horizontal direction of the ray radiographs for inspection of the glenohumeral joint AP Oblique position; the results direction on 15° for examination AP Oblique glenohumeral joint position is 2.97; direction on 25° to the glenohumeral joint inspection AP Oblique position is 2.99; and the results of ray radiographs direction on 30° to the glenohumeral joint inspection AP Oblique position is 2.73.

Image of *glenohumeral joint* with AP Oblique position with better use of horizontal beam direction is more informative because the joint gap between the head of the humerus in the glenoid fossa is completely open and shows a very clear image of the glenoid fossa. Directions rays on 15° and 25° beam direction can be performed to show the glenohumeral joint with an indication of patients with fractures, because the bones of the other bone superpositions do not occur.

#### 4. Conclusion and Suggestion

There are differences in the results of radiographs *glenohumeral joint* AP Oblique direction on 15°, 25°, 30° and horizontal beam. Radiographers should perform the examination with the position AP Oblique position using the horizontal direction ray because it shows a more informative image of the glenohumeral joint.

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#### 6. References

- Ballinger, P. (1995). Merrill's Atlas of Radiographic Positions and Radiologic Procedures Eight edition, Volume 1. Missouri: Mosby Year Book, Inc.
- Kennedy, CA, Manne, M., Heines., Hurley, LA, Johnson, M., & Deide. (2006). Prognosis in Soft Tissue Disorder of the Shoulder: Both Predictive Change in Disability and Level of Discility after Treatment. <<https://www.ncbi.nlm.nih.gov/pubmed/16813480>> Accessed on 20 April 2018
- Kurniasih, R. (2011). Therapeutic Effect of Frozen Shoulder Manipulation on the case with the rigidity of the capsular pattern of the Functional Upgrades. <[http://eprints.ums.ac.id/14611/2/3.\\_BAB\\_I.pdf](http://eprints.ums.ac.id/14611/2/3._BAB_I.pdf)> Accessed on 20 April 2018
- Setiyawati, D., A. Nyoman, and I. Muhammad. (2014). Combination Ultrasound and Traction Shoulder To caudal Proven Same effect with a combination of ultrasound and Codman pendulum exercises in reducing pain and Upgrading Activities Functional Shoulder Joint Syndrome In Patients Impengement Subakromialis. <<https://ejournal.esaunggul.ac.id/index.php/Fisio/article/viewFile/1103/1012>> Accessed on 20 April 2018
- Snell. RS (2000). Clinical Anatomy for Medical Students; Issue 6. Jakarta: EGC.
- Snell, R. (1997). Anatomy clinic, Issue Three, Book PublishersMedical, Jakarta: EGC.
- Stefan, S & Florian, L. (2007). Text and Color Atlas Patofisiologi. Jakarta: EGC.
- Suhastika, SJ (2015). Rehabilitation Management Post Anterior Shoulder Dislocation. <<https://www.scribd.com/doc/269245793/Tatalaksana-Dislokasi-pada-Dislokasi-Anterior-Bahu>>Accessed on 21 April 2018
- Timothy, KH (2017). Introduction to Research Methodology. Yogyakarta: ANDI
- Wibowo, DS. 2009; Anatomy of the Human Body; Wisland house I, Singapore