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RADIOGRAPHY TECHNIQUE OF OSSA MANUS WITH SUSPECTED FRACTURE OF PROXIMAL PHALANG DIGITI 4 AND 5 SINISTRA IN RADIOLOGY INSTALLATION OF EFARINA HOSPITAL PANGKALAN KERINCI 2020

Bambang Kustoyo, Veryyon Harahap, Awan Pelawi, Sabrina Suci Zasneda, Sihat Manisia Siboro, Dea Rahmayani Barus

Lecturer at Universitas Efarina[1,2,3,4,5,6]

Abstract

Radiographs of the human bones are the bones consisting of the carpal bones, the metacarpal bones and the phalanges. Fractures are broken bones, usually caused by trauma or physical exertion, the force and angle of the force, the condition of the bone itself, and the soft tissue around the bone will determine whether the fracture is complete or incomplete. A complete fracture occurs when the entire bone is broken, whereas an incomplete fracture does not involve the entire thickness of the bone. The occurrence of fractures caused by traffic accidents. The purpose of this study was to determine the procedures for carrying out radiography of the human oss with suspected fracture at Efarina Pangkalan Kerinci Hospital. The type of research used was descriptive with data collection techniques by means of observation, documentation and interviews. The results of the examination of the human oss in fracture cases at Efarina Pangkala Kerinci Hospital are generally using postero-anterior and oblique projections. The ideal x-ray machine for ossa manus radiography is a portable x-ray unit or a mobile x-ray unit with relatively low capabilities. The x-ray film used is a high speed type combined with a fast screen intensifying (IS) where this type of film and intensifying screen (IS) can produce images with good detail and sharpness. Thus the radiation dose can also be reduced for the patient and the operator himself. The x-ray film washing process used should preferably use automatic processing. It is hoped that it can be used as a reference for radiographic results, especially in fracture cases. The ideal x-ray machine for ossa manus radiography is a portable x-ray unit or a mobile x-ray unit with relatively low capabilities. The x-ray film used is a high speed type combined with a fast screen intensifying (IS) where this type of film and intensifying screen (IS) can produce images with good detail and sharpness. Thus the radiation dose can also be reduced for the patient and the operator himself. The x-ray film washing process used should preferably use automatic processing.

Keywords: Ossa Manus, Fracture

INTRODUCTION

A. Background

According to Evelin C. Pearce, Radiological examination is an examination that can be used to determine the anatomy and physiology of a person so that Pathological and Traumatic disorders can assist in determining the diagnosis. (Evelin C. Pearce) Ossa Manus is a bone consisting of Ossa Carpalia, Ossa Metacarpalia and Phalanx.

Fractures are broken bones, usually caused by trauma or physical exertion, the force and angle of the force, the condition of the bone itself, and the soft tissue around the bone will determine whether the fracture is complete or incomplete. A complete fracture occurs when the entire bone is broken, whereas an incomplete fracture does not involve the entire thickness of the bone. There are several terms used to describe the type of fracture, namely: transverse fracture, longitudinal fracture, segmental fracture, compression fracture, and avulsion fracture (price, 2005)

Radiological examination is a very precise examination used to determine the anatomy and physiology of an organ so that pathological and traumatic abnormalities can assist in making a diagnosis. The examination used in the Ossa Manus photo shoot is the PA (Postero-Anterior) projection and the Oblique projection. With the description above, the author will explain and make it into a scientific paper with the title:

"Radiographic Examination Technique of Ossa Manus in Proximal Digiti 4 and 5 Left Phalanx Fracture Cases at the Radiology Installation of Pangkalan Kerinci Hospital in 2021"

B. Scope of Writing

At this writing the author chose the projection used is the PA (Postero-Anterior) and Oblique projections. The ideal X-Ray device for Ossa Manus Radiography is a Portable X-Ray unit or Mobile X-Ray unit with relatively low capabilities. The x-ray film used is a high speed type combined with an intensifying screen (IS) which can produce images with good detail and sharpness. Thus the radiation dose can also be reduced for the patient and the operator himself. The x-ray film washing process used should use Automatic Processing.

C. Formulation of the problem

In making this paper, the author will formulate the problems that arise in the examinations carried out, these problems can be formulated:

1. How is the radiographic technique in examining Ossa Manus fractures.
2. What efforts are being made so that the Ossa Manus Radiography examination produces an Optimal Fracture picture

D. Research purposes

To find out how the usual examination and projection techniques are carried out or used in Ossa Manus Radiography examinations in cases of Left Proximal Digiti 4 and 5 Phalange Fractures at the Radiology Installation of Efarina Hospital Pangkalan Kerinci in 2021.

E. Benefits of research

1. For Researchers
   Can be used as a material / source of information from science and learning experience as well as the management of special techniques for Ossa Manus Fractures
2. For Further Researchers
   Can be used as a reference material for literature and Radiology information center, especially in cases of Ossa Manus Fractures
3. For Patients
   Can add to the patient's insight or experience about Ossa Manus Fractures and the patient can be positioned properly and use optimal / minimal doses.
4. For Radiology Specialists

Can diagnose the patient's disease regarding Ossa Manus Fracture

5. For Institutions
   a. Educational Institution
      Can be used as a reference material for literature, especially on Ossa Manus Fractures and can also be used as reading material to support the teaching and learning process
      Hospital Institution
   b. As input material in carrying out radiology services that are oriented to health problems in order to meet basic human needs to improve the quality of radiology services for patients, especially for Ossa Manus Fracture patients

F. Writing method

1. Library Studies
   By reading and studying bibliographical reference books and dictates related to the written work.
2. Learning Experience
   By applying knowledge both theoretically and practically obtained during lectures.
3. Interview
   Collect data and information about patients and their families.
4. Documentation
   Collecting examination documents regarding Ossa Manus Radiography.
6. chapter discussed are as follows:

LITERATURE REVIEWS

A. Anatomy and Physiology

According to Pearce, Anatomy is the study of the composition of the body and the relationship of its parts to one another (Pearce, 2009).

According to Ethel slone Physiology is the science that studies the functions of living bodies such as the science of anatomy and physiology also includes special fields of function of certain organ systems (Ethel slone, 2003).

The upper limbs are divided into several parts, including the ossa manus (hand bones). Ossa Manus (hand bones) is divided into 3 parts, namely: (syaifudin, 2011)

a) Ossa Carpalia
   Ossa Carpalia consists of the proximal and distal parts. The proximal part consists of Scapoid, Lunatum, Triquetrum, and Pisiform. While the distal part consists of Trapezium, Trapezoid, Capitatum and Hamatum.
b) Ossa Metacarpalia
   The Ossa Metacarpalia consists of 5 bones which are found in the wrist and their proximal parts articulate with the distal parts of the carpal bones. The

joints formed by the Carpal and Metacarpal bones make the hand very flexible. Especially in the first metacarpal (thumb) and second metacarpal (index finger) there are sesamoid bones.

Consists of: Caput (articulates with phalanges), Corpus and Base (proximally articulates with ossa carpalia). The caput is bigger than the base.

- Metacarpus 1 : shorter, has an oval articular facet, articulates with the major multangulum.
- Metacarpus 2 : longest, widest base, irregular shape.
- Metacarpus 3 : a triangular base has a styloid process.
- Metacarpus 4 : the base is rectangular.
- Metacarpus 5 : the base is triangular.
- Sesamoid : small bones attached to the heads of the metacarpals.

c) Phalange

The phalanges are long bones that have a shaft and two ends. The stem tapers towards the distal end. There are 14 phalanges on each hand, only the thumb has 2 phalanges and the other fingers have 3 phalanges each.

Ossa Manus (hand bones) is a bone consisting of 8 Carpal bones, 5 Metacarpal bones, and 14 Phalanx bones.

B. Pathology

According to Price Pathology is the science or study of disease. In its broadest meaning, pathology literally means abnormal biology, the study of inappropriate biological processes or the study of sick or disturbed individuals (Price, 2005).

Fractures are broken bones, usually caused by trauma or physical exertion, the force and angle of the force, the condition of the bone itself, and the soft tissue around the bone will determine whether the fracture is complete or incomplete. A complete fracture occurs when the entire bone is broken, whereas an incomplete fracture does not involve the entire thickness of the bone (Price, 2005)

There are several terms used to describe the type of fracture. (Price, 2005)

- Transverse Fracture

  A transverse fracture is a fracture where the fracture line is straight across the bone.
- Longitudinal Fracture

  Longitudinal fractures are fractures where the fracture line is vertical in the bone.
- Segmental Fracture

  Segmental fractures are two adjacent fractures of the same bone that separate the segments of the bone.
- Compression Fracture

  A compression fracture occurs when two bones collide with a third bone that sits between them, like one vertebra against two vertebrae.

- Greenstick fracture
  Greenstick fractures are incomplete fractures and are common in children. The cortex is partially intact, as is the periosteum. These fractures will quickly heal and quickly undergo re-modelling to normal form and function
- Avulsion Fracture
  An avulsion fracture is the separation of a bone fragment at the insertion site of a tendon or ligament.

Here explained the problem of fracture. For example caused by a collision or trauma and caused by KLL (traffic accident). The symptoms caused by these fractures are often encountered, namely: pain, broken tissue, broken bone, inflammation, red or blue discoloration and rupture.

C. Etiology

Etiology is the determination of disease and factors that cause certain diseases (Price, 2005)

The etiology of Ossa Manus Fractures includes blows that result in broken bones, collisions, traffic accidents, falls with the arms extended so that a fracture of the wrist can occur, fractures when the bone itself is brittle.

D. Radiography Technique

According to Hariaty, radiographic technique is a science that studies the procedures for photographing objects examined using x-rays to obtain radiographic images, so as to be able to establish a precise and accurate diagnosis (Hariaty, 2012).

The radiographic techniques used to show fractures in the manus are:

1. Postero-Anterior (PA) Projection (Hariaty, 2012)

Purpose : To show an overview of the Anatomy of Ossa Manus from the Postero-Anterior side.

Patient position : patient sits sideways on the edge of the examination table and adjust the patient's height so that the patient's arms are comfortable on the examination table.

Position of object :

- Rest the antebrachial arm on the examining table and place the manus palmar side down against the cassette.
- Place the MCP (Metacarpophalangeal) joints in the middle of the cassette, and set the cassette parallel to the antebrachi and manus.
- Extend the fingers of the hand being examined.
- Ask the patient to relax his hands to avoid movement. Prevent accidental movement by using a soft bag or plaster. A sandbag may be placed distal to the antebrachi.
- Don't forget to use an apron on the patient to protect sensitive organs.

- At the time of exposure, try to turn the patient to the side that is not being photographed or away from the light.

METHODS

1. Research Locations

The location of this research was carried out at the Radiology Installation of Efarina Hospital, Pangkalan Kerinci, Pelalawan Regency.

2. Research Time

Time of research and data collection Cases of Proximal Digiti 4 and 5 Left Phalanx Fractures with Medial Angulation at the Radiology Installation of Efarina Hospital Pangkalan Kerinci

3. Data Checking Techniques

The data inspection technique is secondary data. The method used in writing this scientific paper uses a descriptive method, while the approach used is a case with a technique;

1. Observation and physical examination by direct observation of the client on matters relating to the client's problems.
2. Documentation studies are carried out by seeking sources of information obtained from the patient's status and matters relating to the patient's problems. Literature study, namely by studying books, papers and other sources to obtain scientific basis related to the fracture of the human os in the 4th and 5th digit proximal phalanges so that the theory can be compared with the implementation in cases in hospitals. In this study, the study observed the implementation of Ossa Manus Radiography starting from the initial examination of the manus with cases of proximal phalangeal fractures to completion.

RESULTS AND DISCUSSION

A. RESULTS

1. Overview of Research Locations

At the Radiology Installation at Efarina Hospital, Pangkalan Kerinci

2. Research Results

a). Patient identity

Name	: Mrs. SSN
Gender	: Female
Age	: 29 Years
No.RM	: 0-140860
Address	: Pangkalan Kerinci
Examination Type	: Manus Sinistra X-ray
Ket.Klinis	: Post KLL
Examination Date	: 23 April 2021

b). History of disease

The patient who was a victim of a traffic accident on April 23, 2021, around 13.00 felt dizzy and had pain in the left hand. With a diagnosis of suspected fracture of the left Manus. On April 23, 2021 the patient was taken to the Radiology room to take a left manus X-ray of the patient.

3. Examination Execution

1). Photo request letter

The patient brings a letter requesting a photo of the human ossa with clinical post KLL, then the patient is taken to the examination room and the cover letter is read by the officer (radiographer) and carries out an examination according to the examination procedure.

2). Tools preparation

a. X-ray machine used

X-ray plane

Name/Brand	: EST 5000 S/F601 HF HIGE
Tube serial number	: 640191713
kv Maximum	: 500 kV
Tube type	: Double Focus

3). Accessories

1. The radiographic equipment required for examination of the human oss is:
2. The tape and film used are 24 x 30 cm in size, 1 sheet without grid
3. The film used is Blue sensitive with High speed
4. Markers are used as signs or codes for patient identification, namely anatomical position marks (L)
5. The intensifying screen used is Blue emitting with High Speed.

4). Inspection Techniques

The radiographic techniques performed to show fracture abnormalities in the human oss are:

1.Projection Postero-Anterior (PA)

Purpose	: To show an overview of the Anatomy of Ossa Manus from the Postero-Anterior side
Patient Position	: The patient is supine on the examination table
Object Position	: Manus is placed vertically above the horizontal cassette. The fingers are placed against the cassette and stretched.

Figure 4.1 PA Projection Image Criteria

Central point (CP)	: Metacarpal digit III
Central ray (CR)	: Perpendicular vertical
Film Focus Distance	: 100 cm
Shooting Conditions	: 50 Kv , 100 mAs
Cassette	: 24 cm x 30 cm without grid (divided in half)
Image Criteria	: You can see the projection of the PA ossa manus, especially the phalanges 4th and 5th

2. Oblique projection

Purpose	: To show an anatomical picture of the ossa manus from the lateral side
Patient position	: The patient is supine on the examination table
Object position	: Ossa manus placed true lateral with the lateral side against the cassette so as not to superposition. The cassette is placed horizontally on the examination table
Central point(CP)	: Metacarpal digiti III
Central ray (CR)	: Perpendicular vertical
Film Focus Distance	: 100 cm
Shooting Conditions	: 50 kV , 100 mAs
Cassette	: 24 cm x 30 cm without grid
Image criteria	: A lateral view of the manus bone

Figure 4.2 Criteria for Lateral Projection Images

5. Evaluation of Photo Results

After carrying out a radiographic examination of the human ossa with a suspected fracture, starting from the radiography and the chemical film washing process, the resulting X-rays can be evaluated as follows:

Evaluation of PA projection examination results

1. An anatomical picture of the human oss is visible from the Postero-Anterior position without superposition
2. Film size 24 cm x 30 cm
3. Image sharpness is sufficient
4. The radiographic image density is sufficient
5. Radiographic image details are sufficient
6. Radiographic image contrast is sufficient

Evaluation of the results of the lateral projection examination

1. Anatomical view of the human ossa from the lateral view. A picture of the fracture in the manus is seen
2. Film size 24 cm x 30 cm
3. Image sharpness is sufficient
4. The radiographic image density is sufficient
5. Radiographic image details are sufficient
6. Radiographic image contrast is sufficient

6.Film processing

Film processing carried out at the Radiology installation at Efarina Hospital Pangkalan Kerinci is automatic processing.

B. DISCUSSION

Based on the radiographs that have been obtained regarding the examination of the left left ossa fracture at the Radiology Installation of Efarina Hospital Pangkalan Kerinci, in general the examination of the left ossa fracture uses the PA and Lateral projections

because with this projection it can already reveal the suspected abnormality in this case a fracture in the 4th digit manus bone and 5.

In my opinion, from a theoretical point of view, the projection that provides a clearer radiograph regarding the examination of an ossa fracture is a lateral projection because this projection can provide information about the suspected abnormality and in the radiographic appearance there is no superposition between the phalanges digiti 1,2,3, 4, and 5.

The advantage of examining the left ossa fracture is that the patient can clearly know the location of the left ossa fracture based on the anatomy, and besides that the radiation received by the patient is less because the area of the irradiation field is carried out as needed. The disadvantage of this examination is that the patient feels pain due to the hand being moved in order to get a good picture.

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