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RADIOGRAPHY TECHNIQUE OF OSSA PELVIS WITH SUSPECTED FRACTURE OF RAMUS PUBIS AT EFARINA ETAHAM HOSPITAL BERASTAGI KARO DISTRICT 2021

Awan Pelawi, Bambang Kustoyo, Sabrina Suci Zasneda, Sihat Manisia Siboro[4], Rian Riko Siringoringo[5]
Lecturer at Universitas Efarina[1,2,3,4,5]

Abstract
Fracture is a broken bone, a break in bone tissue that is commonly caused by forced injuries. The cause of fracture is an accident, be it a work accident, traffic accident. Broadly speaking, fractures are divided into three types, namely closed fractures, closed fractures, and complex fractures.
The examination aims to determine the results of radiographic images, if there is a fracture or dislocation and is caused by KLL factors (traffic accidents). The aim of the study was to find out how the radiographic examination technique of Ossa Pelvis with the suspicion of a Ramus Pubis Fracture at the Radiology Installation of Efarina Berastagi Hospital in 2021. This type of research is descriptive research with data collection techniques by observation, documentation study and literature (library) study. The results of the examination of the Ossa Pelvis with the suspicion of a Ramus Pubis Fracture at the Radiology Installation of Efarina Etaham Berastagi Hospital are generally using AP (Anterior Posterior) projections using conventional X-rays. The x-ray film used is a high speed type combined with a fast screen intensifying (IS) where this type of intensifying screen (IS) film can produce images with good detail and sharpness. Thus the radiation dose can also be reduced for the patient and the operator himself. The film washing process should use Automatic Processing. It is hoped that it can be used as a reference for radiographic results, especially in cases of Ramus Pubis Fractures.

Keywords : Suspected Fracture of Ramus Pubis

INTRODUCTION

A. Background

Fracture is a termfrom loss of continuity of bone, cartilage, either total or partial. In summary and in general, fractures are fractures caused by trauma or physical exertion (Helmi, 2012). According to Wahid, 2013 Fracture is a break in bone tissue which is commonly caused by force majeure. The cause of a fracture is an accident, be it a work accident, traffic accident and so on. According to Noor Zairin 2016 Pelvic ossa fracture is a disconnection of the pelvic bones, either the pubic bone or ilium bone caused by a trauma or collision. Radiological examination is a very appropriate examination to determine the anatomy and physiology of an organ so that abnormalities in pathology and trauma can help in making a diagnosis. From the research that the authors have done, there are many cases of pelvic fractures or broken bones. So the authors conducted research on "Radiographic Examination Techniques of Ossa Pelvis with Suspected Ramus Pubic Fractures at Efarina Etaham Berastagi Hospital, Karo Regency 2021".

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 use Automatic Processing.

B. 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

C. 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.

D. 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

b. Hospital Institution
   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

E. 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.

F. Writing system

The contents of each chapter discussed are as follows:

INTRODUCTION

Filled with the background of the problem, the scope of writing, the formulation of the problem, the purpose of the examination, the writing method, and the contents of the writing.

THEORETICAL REVIEW

- Contains a description of the basic concepts which include the notion of examination, anatomy, physiology and pathology, radiological aircraft engineering, radiodiagnostic physics, radiation protection, and x-ray film processing. Meaning of Inspection Radiological examination is one of the examinations that is very necessary in establishing the diagnosis of a disease. Therefore, knowledge of radiology is an important subject in medical education (Bambang, 2014) Pelvic radiography is a radiographic examination process using x-rays. To show the pelvis and evaluate abnormalities in the form of fractures.
- Anatomy
  According to Putri Dafriani 2019 in her book Anatomy is a science that studies the structure of the body and the relationships between them.
  According to Asih Puji Utami, Sudibyo Dwi Saputra and Fadli Felayani 2014 in their book Pelvis functions to connect the spine to the lower extremities, the pelvis is composed of four bones namely, two hip bones (also called coxae or innominate), one sacrum bone and one cocigeus bone. The parts are as follows:
  - Coxae
    The coxae consist of three parts: the ilium, ischium and pubis. The acetabulum is a deep cavity where the femoral head joints. The ilium is the largest part of the coxae, located superior to the acetabulum. The ischium is inferior and posterior to the acetabulum and the pubis is inferior and anterior

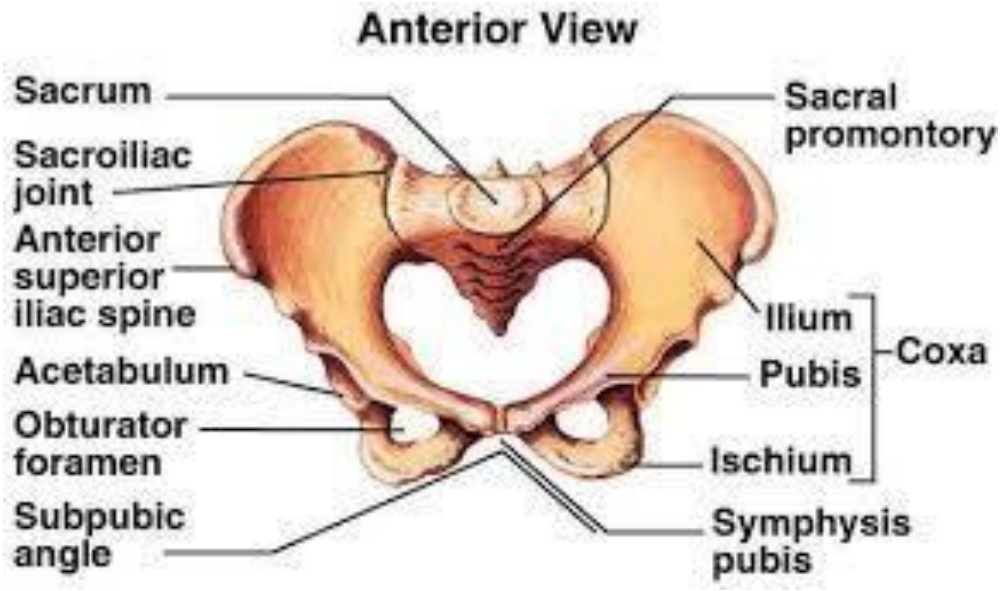
to the acetabulum. (Asih Puji Utami, Sudibyo Dwi Saputra, Fadli Felyani, 2014)

- Ilium

  It consists of two parts, the corpus and ala/wing. The body of the ilium lies more inferiorly close to the acebatulum and the superior two-fifths of the acetabulum is part of the corpus coxae. Ala is the thin and wide part located on the superior side. The upper edge of the ilium is called the cristae which extends from the anterior angle or is called the Anterior Superior iliac Spine (SIAS) to the posterior angle or is called the Spina Iliaca Posterior Superior (SIPS). (Asih Puji Utami, Sudibyo Dwi Saputra, Fadli Felyani, 2014)
- Ischium

  It is part of the coxae which lies inferior and posterior to the acetabulum. The ischium is also divided into two parts, namely the body and ramus. The upper part of the body of the ischium forms the posteroinferior two-fifths of the acebatulum. The lower portion of the body of the ischium forms caudal and medial to the acetabulum to the ischial tuberosity. The anterior portion of the ischial tuberosity is part of the ischial ramus. (Asih Puji Utami, Sudibyo Dwi Saputra, Fadli Felyani, 2014)
- Pubic

  The last part of the coxae is the pubic bone. The body of the pubis lies inferior and anterior to the acetabulum. One-fifth of the acetabulum. Leading anteriorly and medially from the body of each pubis are the superior rami. The two sides of the superior ramus meet in the middle which is a joint and can move called the symphysis pubis. In the coxae there is also a large hole which is located surrounded by the acebatulum, ischium and pubis which is called the Obturatorium Foramen. This foramen is the largest foramen in the human body. (Asih Puji Utami, Sudibyo Dwi Saputra, Fadli Felayani, 2014



- Physiology

  According to Putri Dafriani 2019 in her book Physiology is the science that studies body functions and how the body works.

  According to Ethel Sloane (2003) in her book Physiology is the science that studies the functions of a living body, such as anatomy and physiology which also cover special areas of function of certain organs.

- Pathology

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

  According to Farida, Abdurohman, and Yuke 2018 Pathological fractures occur due to an underlying disease so that the bones become porous or not strong, for example in osteoporosis sufferers. Farida, Abdurohman, and Yuke 2018 also stated that in general fractures can be divided into 3 types, namely:

- Closed fracture or closed fracture

  Closed fracture or closed fracture, which is a type of fracture that is not accompanied by an injury to the lu. Understanding Examination

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  Pelvic radiography is a radiographic examination process using x-rays. To show the pelvis and evaluate abnormalities in the form of fractures.

RADIOGRAPHY TECHNIQUES

Radiographic technique is the science that studies how to photograph the object being examined using x-rays to obtain radiographic images, so as to be able to establish a precise and accurate diagnosis (Clark S, 2005)

According to Bontrager, 2001 radiographic techniques performed to show pelvic ossa fractures in the pubic ramus are:

AP projection

- Purpose of examination: Examine pelvic bone radiographs and show fractures, dislocations, degenerative disease and bone lesions.
- Patient position: The patient is supine, the arms are placed at the sides and crossed over the chest, for comfort, place a pillow under the patient's head.
- Object position: The cassette is arranged transversely, the edge of the cassette is set slightly above the iliac crista, so that the image of the crista is not cut off. The lower edge of the cassette conforms to or slightly below the pubic symphysis. The MSP of the patient's body is aligned in the middle of the cassette. Legs straight, feet internally rotated 15-20 degrees, neck of the femur appears in the longest position (true AP). Ensure that the pelvis is not rotated.

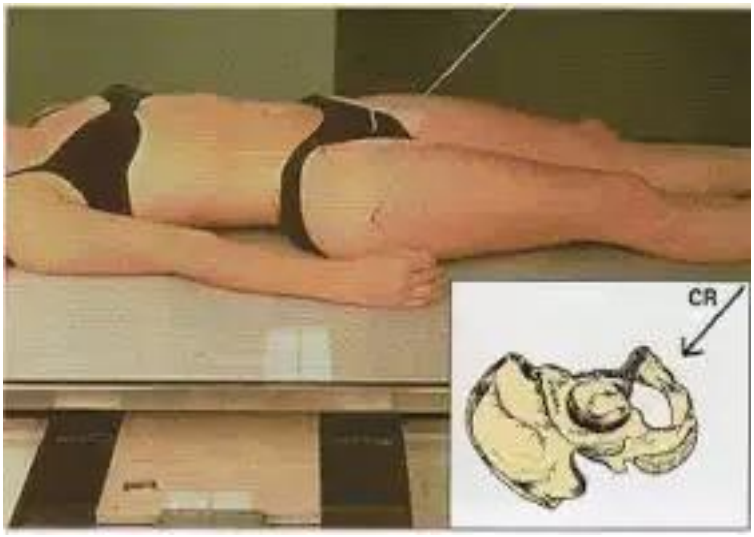

Figure 2.2 : AP Projection (Bontrager, 2001)

Central Point (CP)	: At MSP 2”(5cm) high below SIAS Central
Ray (CR)	: Upright straight cassette
FFD	: 100 cm
Cassette	: 30cm x 40cm
exposure	: When the patient is not moving Image
Criteria	: - Visible pelvic bones
	- Appears L5, sacrum, and cocygeus
	- Visible head of the greater trochanter femur

Figure 2.3 : AP Projection Results (Bontrager, 2001)

B. RONTGEN AIRCRAFT TECHNIQUES

According to Rasad 2005 X-ray aircraft is an aircraft or equipment that can produce x-rays. Where in the medical field it is used as a tool to diagnose and treat a disease.
Rasad 2005 also mentions that there are several components of an X-ray machine, namely:

1. X-ray tube

X-rays are emission of electromagnetic waves similar to radio waves, heat, light and ultraviolet rays, but with very short wavelengths and X-ray tubes can be seen in Figure 2.4.

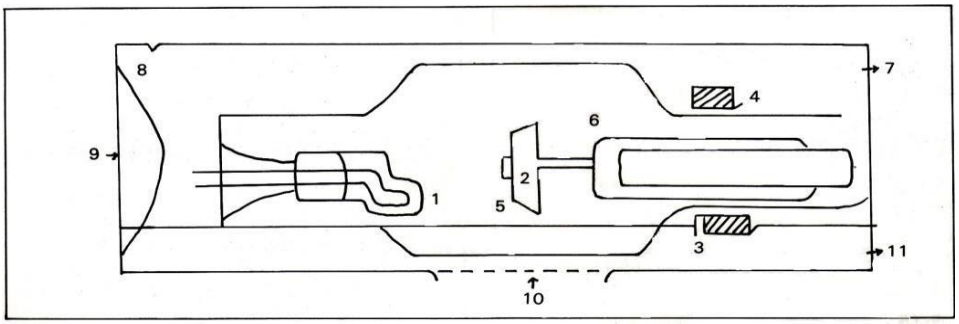

Figure 2.4: Rotating Anode X-ray Tube (Rasad, 2005)

Caption :

1. Cathode
2. anode
3. Rotor
4. Stator (outside insert tube)
5. Target (anode plate) from wolfarm
6. Moly denum stalk
7. Tube housing
8. Diaphragm expansion
9. Knob
10. Tube window

ar the surface of the skin is not damaged or still intact, so that the broken part of the bone is not in contact with the outside.

2. Open fracture or open fracture
   Open fracture or open fracture, which is a fracture condition accompanied by injury to the broken bone area, but not all open fractures make the bone look protruding.
3. Complexity fracture
   Complexity fractures, namely if there are two conditions, for example in the extremity there is a fracture and the joint also has a dislocation.

C. RADIOGRAPHY TECHNIQUES

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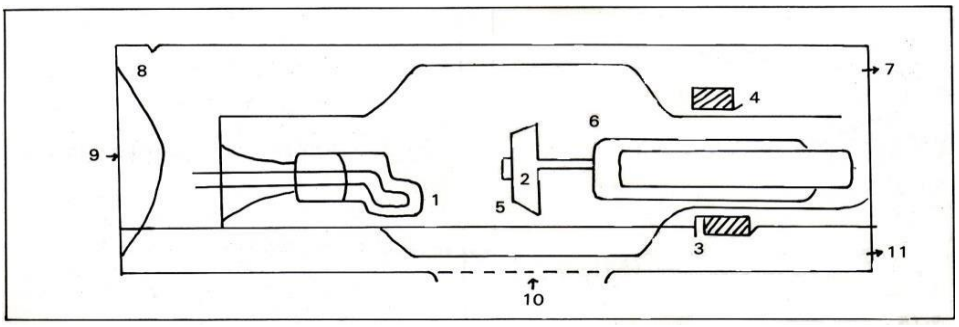

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METHODS

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
Female gender
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

b. Accessories

The radiographic equipment required for examination of the human oss is:

(a) The tape and film used are 24 x 30 cm in size, 1 sheet without grid
(b) The film used is Blue sensitive with High speed
(c) Markers are used as signs or codes for patient identification, namely anatomical position marks (L)
(d) 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:

a. 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

b. 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
7. 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, when viewed from a theoretical point of view, the projection that provides a clearer radiograph regarding the examination of a manus fracture is a lateral projection because this projection can provide information about the suspected abnormality and on 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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