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Radiography Cervical Vertebrae with Suspect Spodylosis at the Prof. Dr Chairuddin Panusunan Lubis Educational Hospital University of North Sumatra Medan

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ABSTRACT

The cervical vertebrae (neck bones) are vertebrae which consist of seven segments which have small segment bodies and large segment openings. Radiographic techniques are the science of studying procedures for photographing objects that are examined using X-rays. Cervical spondylosis is a common degenerative disease of the cervical spine. To show abnormalities in these organs, X-rays in the field of radiology are needed. Therefore, a radiological examination is needed to show whether there is spondylosis and its effect on the surrounding organs. with AP Axial and Lateral examination techniques. The AP Axial projection shows an image of the cervical spine from the AP position. Lateral projection shows an image of the cervical vertebrae from a lateral position, and spondylosis is clearly visible at C3 and C4. In collecting data, the author used interviews and field observations. The results of the diagnostic examination provided information about abnormalities in the cervical spine using Computer Radiography (CR), a cassette measuring 24 cm x 30 cm with a device used by Philips with a capacity of 500 mA.

Keywords: *Cervical, Spondylosis, Radiography (CR)*

1. INTRODUCTION

Ve r tebra Cervicalis is bone rear consisting from on seven segments that have segment bodies small and hollow the section big. On the head his wings there is hole then nerve called the transverse foramen [1]. Spondylosis is spinal vertebral abnormalities, accompanied by degeneration and formation of new bones accompanied by stiffening of the connections between the vertebral segments [2].

Cervical spondylosis is something disease common degenerative disease of the bones cervical. This is most common caused by changes in the intervertebral discs due to change age [3]. According to Ballinger (2003), radiographic techniques are the science of studying the procedures for photographing objects being examined using X-rays [4]. And at the same time to obtain optimal radiographic images so as to be able to make an accurate diagnosis. Abnormalities that occur in the cervical spine including spondylosis [5]. For show abnormalities in these organs needed X- ray in field radiology [6]. Because of That needed inspection radiology For show There is or not spondylosis and its influence to the surrounding organs [7].

Based on the background above, the author wants to study in more depth the examination of the cervical vertebrae in the form of a scientific paper with the title : "Radigraphy of the Cervical Vertebrae with Suspected Spondylosis at Prof. Dr. Hospital [8]. Chairuddin Panusunan Lubis, University of North Sumatra [9].

2. METHODS

Types of research

Cervical spine radiology with suspected spondylosis uses qualitative research. According to Sugiyono (2013) Qualitative research is a research method based on post-positivism philosophy. Used to research the conditions of natural objects, where research is the key instrument, data source sampling is carried out purposively and snowball

collecting techniques using triangulation (combination), data analysis is tinductive/qualitative, and qualitative research results emphasize meaning rather than generalization [10].

Time and Place of Research

Radiographic examination of Cervical Vertebrae with suspicion of Spondylosis Research time: May 2023. Research location : Radiology Installation at Pendikan Hospital , Prof. Dr. Chairuddin Panusunan Lubis, University of North Sumatra [11].

Population and Sample

Population is the entire subject of research. The population in this study was all patients at home patient who performs a cervical spine radiographic examination. The samples in this study were patients who underwent radiographic examination of the cervical spine with suspected spondylosis. The sampling technique uses a Purposive Sampling technique, namely taking samples according to the researcher's needs, so that the sample in this study consists of one person in the form of medical record data in the form of x-ray films [12].

Research Instrument

Research instruments are tools or facilities used Computed Radiography, image plate, computed radiography film, contrast media, fluoroscopy, image printer, apron, medical record data from x-rays. In research, collecting data makes the work easier and the results are better, more accurate, complete and systematic so that they are easier to process.

Data collection technique

Data collection techniques are the most strategic step in research, because the main aim of research is to obtain data.

In researching this scientific paper the author can collect data:

1.Observation

According to S. Nasution (1996) Observation is a process composed of various biological and logical processes. Two of the most important are the processes of observation and memory. In this scientific paper, data is obtained by directly observing and following the Cervical Vertebra examination carried out on the patient starting from the time the patient arrives until the patient goes home with the results.

2. Documentation

According to (Sanafiah, 2002) Dukomen is a record of events that have passed. Documentation can be in the form of writing, drawings, or someone's monumental works. Document study is a tool for using observation and interview methods in qualitative research. By studying the results of vertebral radiographs Cervica l found during clinical practice are either normal or have abnormalities, especially spondylosis [13].

3. Interview

According to (Sutrisno, 1989) an interview is a meeting of two people to form information and ideas through questions and answers, so that meaning can be contributed to a particular topic. In this scientific paper, we conduct interviews with the patient's family regarding the disease the patient is suffering from. Discussion and collaboration with radiographers, and consultation with supervisors related to examination and writing of scientific papers.

Data analysis

Sugiyono (2013) stated that data analysis is the process of systematically searching and compiling data obtained from interviews, field notes and other materials, so that it can be informed to other people. Qualitative data, namely data related to the categorization of characteristics or properties of variables, this data is in the form of sentences, statements and images. The data that has been collected is processed [14]. Then connect it to the hypothesis and then get a conclusion [15]. From the results of the examination carried out, a radiographic image of the cervical vertebrae with suspected spondylosis was obtained which is good for reading and making a diagnosis in selecting tools and procedures carried out on the patient [16].

3. RESULTS AND DISCUSSION

Results

Patient identity

Name: E.Y
Age: 48 yrs
Female gender
Inspection time: 01-02-2023
Type of examination: Cervical Vertebrae Radiography
DD/suspect: Spondylosis
Reader doctor: Dr. Elvita R. Daulay, M. ked (Rad), Sp. Rad (K)

Implementation of Inspections

1. Read letters requesting photos, especially diagnoses, while from the sending doctor requesting photos *of the cervical vertebrae* .
2. Patient Preparation
   On implementation radiography *vertebrae cervical* with guess *spondylosis* does not require special preparation, but patients are asked to remove clothes, accessories and earrings, then replace them with clothes inspection Which has been provided.
3. Officer preparation
   1.Prepare complete equipment needed according to request for CR inspection, immanging plate, apron
   2.Wash your hands according to procedure
   3.Equip yourself with PPE (mask, gloves, apron)

Preparation of Inspection Tools

X-ray plane

Before held inspection should radiographer do warmup tool as well as choose factor exposure required [17]. As for preparationtool inspection *Vertebrae Cervical* with guess *Spondylosis* in Installation Home Radiology Prof. Dr Chairuddin Panusunan Lubis University Educational Hospital Sumatra North is as following:

Brand Aircraft X-ray: Phillips Number Series : 10140193

Type Generator : Med/HF

Service Aircraft : Radiography

Maximum Voltage (Kv): 150 kV

Maximum current (mA): 500 mA

Figure 1. X-ray aircraft at Prof.dr. Teaching Hospital. Chairuddin Panusunan Lubis, University of North Sumatra

Information :

1. Bucky Stand
2. Fluoroscopy
3. X – Ray Tubes
4. Table Inspection

Examination Techniques

After The equipment is prepared then the author carries out an inspection. The projections carried out here are in accordance with the examination carried out by the author on the patient, namely Antero-posterior and lateral projections.

Antero Posterior Axial Projection

Purpose of Examination : To show anatomy and abnormalities in the *cervical* vertebrae specifically *spondi losis* .

Position Patient : Stand facing the direction of the light

Position Object : Place object in the middle of the tape with both hands beside the body and the head tilted as far back as possible [18].

Figure 2. Antero – Posterior Axial Patient Position

Focus Film Distance: 100 cm
Central Ray: 15°-20° caudo cranial
Central Point : IV cervical vertebrae
Imaging plate : 24 cm x 30 cm
Exposure Factor : 70 kV, 8 mAs

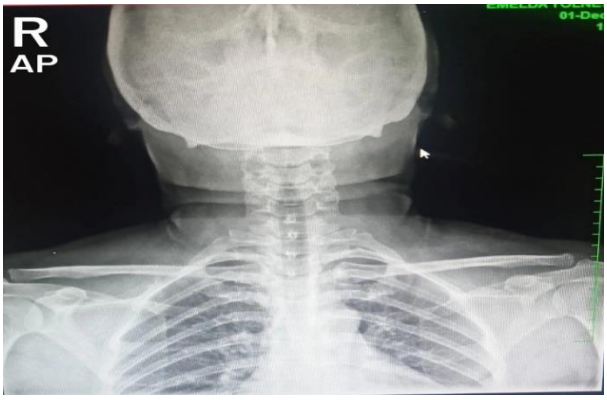

Figure 3. Results of *cervical vertebrae radiography* with antero-posterior axial projection

Lateral Projection
Purpose of Examination: To show description anatomy and cervical vertebral disorders **.** Specifically Spondilo sis from lateral aspect. Position Patient : Stand with one side body attached to the cassette Position Object : Place one body attached to the true lateral cassette , place mid coronal body plane parallel with immanging plate . Both shoulders are pulled down as far as the patient can . The chin is tilted as far as the patient can . Place C4 in the middle immanging plate [19].

Figure 4. Lateral Position

Focus Film Distance : 1 20 cm
Central Ray : Horizontal perpendicular to the cassette

Central Point : On cervical IV
Imaging plate : 24 cm x 30 cm
Exposure Factor : 75 kV, 8 mAs

Figure 5. Lateral projection *cervical spine* radiography results

Evaluation of Results

Evaluation The inspection that is :

1. Evaluation picture on Antero proje Posterior
    1. Looks Description The mandible and base bones of the head are superposed with cervical I and cervical II while cervical II to VII are visible on the radiographic image
    2. Details And The contrast is sufficient, which is able to show bone tissue.
    3. There is no movement when exposure is carried out, indicated by firm bone boundaries
    4. The area of the radiation field is too wide [20].
2. Evaluation picture on Lateral projection
    1. The picture shows that cervical I to cervical VII are free from over lapping
    2. There is no rotation as indicated by the superposition of the two mandibular ramus
    3. Detail the image and Contrast enough because it can damage bone tissue [21].
    4. There is no movement during exposure, indicated by firm bone boundaries
    5. The area of the radiation field is too wide [22].
    6. Magnification occurs on the radiographic image [23].

Radiology Specialist Doctor's Expertise Results

Expertise results doctor attached

Discussion

After writer discuss review theoretical and doing radiography *cervical vertebrae* with guess *spondyl osis*, author This will try discuss problems encountered namely [24]: " How efforts made For get description radiography *Cervical Vertebrae with* optimal detail and sharpness ?"

Cause of Problem

1. In the Antero-Posterior projection it is only able to show cervical II to cervical VII
2. The use of collimation that is too broad and does not suit the object
3. The patient's position is not precise enough so that the resulting image is not right in the middle of the film.
4. Magnification is visible in the lateral projection

Efforts to Overcome Problems

1. Projection Photoshoot
On inspection radiography *Vertebrae Cervical* with guess *Spondylosis* The projections used are Antero – Posterio Erect and Lateral and added with Antero Posterior Open Mouth projection to show cervical I and cervical II [25].

2. Collimation used
Using a field area that is too large will result in large scattered radiation so that the image results are less than

optimal, so it is better to use a field area that is appropriate to the object. Apart from that, it is also necessary to pay attention to the radiation dose received by the patient, where the wider the collimation, the greater the radiation dose received by the patient [26].

3. Communication with Patients
   Before the examination is carried out, it is best to explain to the patient first the procedures for cervical examination in language that is easy for the patient to understand and comprehend so that the patient understands and does not move during the exposure and remains in the position that has been positioned until the exposure is complete [27].
4. Tool Operation
   Before examining the lateral projection, it is a good idea to increase the FFD to minimize magnification and when the FFD is increased, the exposure factor is also increased so that the continued penetrating power is able to penetrate the object [28].

4. CONCLUSION

From the results of the inspection which has been described in this paper with the title "Radiography vertebrae cervical with guess spondylosis " in Installation Radiology House Prof. Education Hospital Dr. Chairuddin Panusunan Lubis, University of North Sumatra so the writer can take conclusion as follows:

1. On implementation radiography vertebrae cervical with guess spondylosis need exists Work The same between radiographer And patient with the aim is to make things easier inspection.
2. Radiation protection during cervical spine radiography examination is not appropriate or the field area is too wide.
3. In the Antero - Posterior projection it can only show Cervical III to Cervical VII
4. On inspection Vertebrae Cervical with guess Spondylosis requires detail and sharpness picture.
5. Magnification occurs in the lateral projection image

Suggestion

1. Before done action radiography vertebrae cervicalis with guess spondylosis, it is necessary to inform the patient about the things that need to be done in language that is easy to understand and that the patient can understand.
2. Should When examining cervical spine radiographs, it is necessary to pay attention to the area of the field that corresponds to the object in order to minimize the radiation dose received by the patient
3. to add an antero-posterior open mouth projection to the cervical examination with suspicion of pondylosis to show cervical I and cervical II images.
4. For get results sharp picture and optimal detail should use focus small with small OFD and FFD
5. It is recommended that the FFD lateral projection be increased in order to minimize magnification and increase the exposure factor so that the rays that come out are sufficiently transmitted to penetrate the object.

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