Journal of Clinical Pharmacy and Pharmaceutical Science
Vol.4, No.2 Oktober 2025
e-ISSN: 2829-3460; p-ISSN: 2829-3452, Hal 33-40

Thorax CT Scan Examination Procedure In Lung Tumor Cases At Bhayangkara Hospital Makassar

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Abstract. *Background: A CT scan is a media imaging tool that uses x-rays to obtain images/photos inside the body. Thorax CT Scan is performed to identify existing conditions in the mediastinum of the lungs. Therefore, the use of Slice Thickness is very influential in looking at the image quality of a Thorax CT Scan. Methods: This research uses qualitative research with a case study research design to investigate phenomena that occur in real life contexts using various sources as evidence. Results: The result of this research is that the use of a Slice Thickness of 3 mm in viewing image quality is good enough to display the structure of the anatomical image so that it can diagnose existing pathology. Conclusions: The Thorax CT Scan examination procedure in lung tumor cases at Bhayangkara Makassar Hospital has followed the applicable SOP. The results of the image quality using a Slice Thickness of 3 mm are quite good in diagnosing the patient's disease.*

Keyword : *Thorax CT Scan, Slice Thickness, Image Quality*

Abstrak. Latar Belakang: CT scan merupakan suatu media alat pencitraan yang menggunakan sinar X untuk memperoleh gambar/foto bagian dalam tubuh. CT Scan Thorax dilakukan untuk mengidentifikasi kondisi yang ada pada mediastinum paru. Oleh karena itu penggunaan Slice Thickness sangat berpengaruh dalam melihat kualitas gambar CT Scan Thorax. Metode: Penelitian ini menggunakan penelitian kualitatif dengan desain penelitian studi kasus untuk menyelidiki fenomena yang terjadi dalam konteks kehidupan nyata dengan menggunakan berbagai sumber sebagai bukti. Hasil: Hasil dari penelitian ini adalah penggunaan Slice Thickness 3 mm dalam melihat kualitas gambar sudah cukup baik untuk menampilkan struktur gambar anatomi sehingga dapat mendiagnosis patologi yang ada. Kesimpulan: Prosedur pemeriksaan CT Scan Thorax pada kasus tumor paru di RS Bhayangkara Makassar telah mengikuti SOP yang berlaku. Hasil kualitas gambar menggunakan Slice Thickness 3 mm cukup baik dalam mendiagnosis penyakit pasien.

Kata Kunci : CT Scan Thorax, Ketebalan Irisan, Kualitas Gambar

INTRODUCTION

CT Scanner scanning is a media imaging tool that uses x-rays to obtain images/photos inside the body. CT scanning takes images of some of the organs being examined, so the images obtained are sharper and more detailed than ordinary x-rays. Thorax CT Scan is performed to look for and identify conditions in the mediastinum or lungs. MSCT (Multi Slice Computed Tomography) offers a much faster and very beneficial scan of the thorax area. MSCT can also produce high-resolution images of the heart and lungs.

At the Radiology Installation at Bhayangkara Hospital, the SOP for CT Scan Thorax Examination is an examination using the CT Scan modality to show the anatomy of the organs and bones of the chest cavity. In the Thorax CT Scan examination of lung tumor cases at Bhayangkara Hospital, it was seen that there was a difference in the use of a protocol with a slice thickness of 3 mm and a contrast media injection technique with a post-injection delay time of 35 s. As for the underlying theory, according to (14), the Thorax CT Scan examination uses a Slice Thickness of 8 mm and according to (18), the delay time used is 45-70 s. Based on this background description, the author is interested in carrying out further studies regarding

Received Agustus 30, 2023; Revised September 30, 2023; Accepted Oktober 01, 2023
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the differences between theory and the field and raised it as a thesis with the title "**THORAX CT SCAN EXAMINATION PROCEDURE IN LUNG TUMOR CASES AT BHAYANGKARA HOSPITAL, MAKASSAR**"

METHODS

The type of research carried out by the author in writing this thesis is descriptive qualitative research with a case study approach. This research will be carried out in April 2023 at the Radiology Installation at Bhayangkara Hospital, Makassar. The subjects of this research consisted of radiographers who carried out Thorax CT Scan examinations in Lung Tumor cases, specialist radiologists. The instruments used by the author to collect data in this research were Observation Guidelines, Interview Guidelines, Books and Stationery, Mobile Phones and Laptops.

RESULTS AND DISCUSSION

Researchers observed the Thorax CT Scan examination procedure in Lung Tumor cases at the Radiology Installation of Bhayangkara Hospital, Makassar. The history and data from the patient:

- Patient 1

Based on the results of observations, a male patient with the initials Mr. M, 54 years old, was taken by family and nurses to the radiology room with the patient experiencing shortness of breath and pain in the chest.

Name	: Mr. m
No. RM	: 149489
Date of Birth	: 05/08/1968
Diagnosis	: Lung Tumor
Photo Request	: Thorax CT Scan + Contrast

- Patient 2

Based on the results of observations, a female patient with the initials Mrs. H, 83 years old, was taken by his family and nurses to the radiology room with a continuous cough, shortness of breath and pain all over

Name	: Mrs. H
No. RM	: 236138
Date of Birth	: 05/25/1940
Diagnosis	: Lung Tumor
Photo Request	: Thorax CT Scan + Contrast

- Patient 3

Based on the results of observations, a male patient with the initials Mr. A, 59 years old, was taken by his family and nurse to the radiology room with a continuous cough, shortness of breath, hoarse voice and chest pain.

Name : Mr. A
No. RM : 427408
Date of Birth : 18/10/1963
Diagnosis : Lung Tumor
Photo Request : Thorax CT Scan + Contrast

Characteristics of Research Subjects

The Thorax CT Scan examination procedure in Lung Tumor cases at the Bhayangkara Hospital Makassar Radiology Installation involves a Radiographer, Radiologist and the sending doctor.

The Thorax CT Scan examination in this lung tumor case involved 7 research subjects including 3 radiographers, 3 radiologists, and 1 sending doctor (pulmonary specialist). The characteristics of the research subjects are:

Table 4.1 Characteristics of Research Subjects

Subject Study	Day/ interview date	Gender	Education/ Year	Experience Radiology field
1	Saturday/29 April 2023	Male	Radiographer r	5 years
2	Wednesday/03 Mei 2023	Female	Radiographer	8 years
3	Monday/08 Mei 2023	Male	Radiographer	5 years
4	Friday/05 Mei 2023	Male	Radiology Specialist Doctor	15 years
5	Thursday/11 Mei 2023	Female	Radiology Specialist Doctor	6 years
6	Friday/12 Mei 2023	Male	Radiology Specialist Doctor	10 years
7	Friday/12 Mei 2023	Male	Lung Specialist Doctor	10 years

Research subjects 1 – 3 are radiographers who are in charge of the CT Scan room and have a work period of 5 – 8 years. Research subjects 4 - 6 are radiology specialists and have a working period of 6 - 15 years. And 1 research subject as the sending doctor was a pulmonary specialist with 10 years of service.

Thorax CT Scan Examination Procedure at Bhayangkara Hospital Makassar

The procedure for examining a CT scan of the thorax in cases of lung tumors at

Bhayangkara Hospital, Makassar, according to observations made by researchers, is a pre-contrast CT scan of the thorax, after which a contrast CT scan of the thorax is carried out.

The thorax CT scan procedure at Bhayangkara Hospital Makassar has 2 types of patients, namely outpatients and inpatients. The chest CT scan examination is in accordance with the capabilities of the CT scan tool and is seen from how cooperative the condition of the patient who will carry out the examination is. The first thing to do in the examination procedure is a laboratory check to determine urea creatinine. This chest CT scan examination is carried out with additional examination, namely the introduction of contrast media intravenously.

Patient Preparation for Thorax CT Scan Examination

The first patient preparation carried out is an anamnesis by the doctor to find out the patient's history of diseases and allergies. If the patient takes sugar medication, they will be instructed to stop it 2 days before the examination. Next, check the urea creatinine and if the results are normal, the patient will be scheduled, given a preparation sheet for equipment and materials that must be prepared by the room nurse, then instructed to fast from food and drink for at least 4 - 6 hours before the CT scan with contrast media is carried out. Before entering the examination room, the patient's blood pressure and body weight are checked again, then ensure that the area to be scanned is free from metal objects. After the patient enters the radiology room, the radiographer will explain the examination to be carried out, and provide informed consent which will be signed by the patient or the patient's family. After that, continue with the skin test.

Preparation of Tools and Materials

Preparation of tools and materials for the CT scan of the thorax at Bhayangkara Makassar Hospital includes the tools prepared in the form of a Toshiba 80 Slice Brand MDCT Scan aircraft, injector and its equipment (syring), computer, image console or printer. The materials prepared by the nurse from the patient are Iohexl brand 50 ml Iodine contrast medication, Abocath no.18 & no. 20, konekta / 3 way, infusion set & RL, NaCl for saline and 1 cc syringe for skintest.

Scanning Preparation

After the patient enters the examination room, the patient will be asked to remove clothes or change into the clothes provided / a special hospital gown. Patients are asked to remove items or objects around the scanning area that will interfere with the results of the radiograph. The patient then lies on the foot first examination table with both hands above the head. Add a fixation device if the patient requires it. For comfort, the patient will be given a pillow and body strap to ensure the patient remains lying without moving and remains in the

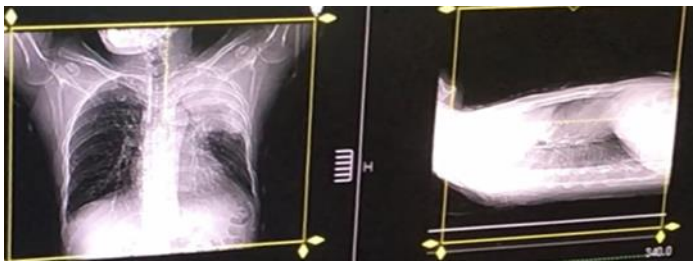
middle of the examination table. The patient will be asked to follow the instructions.

Contrast Media Insertion Technique

The technique for inserting contrast media for Thorax CT Scan examinations in lung tumor cases is intravenously using a Dual Syringe Injector. Before carrying out the inspection, a potential test is carried out to determine the flow rate that will be used. The flow from the injector uses a flow rate with a contrast volume of 1 cc/BB.

Thorax CT Scan Examination Technique in Lung Tumor Cases

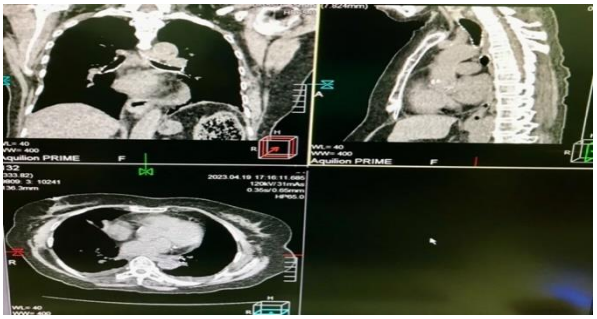
The scannogram or topogram is determined after the initial scanning to continue or determine the location of the examination needed at Bhayangkara Makassar Hospital. There are two scannograms shown, namely the Antero Posterior (AP) and Lateral positions.



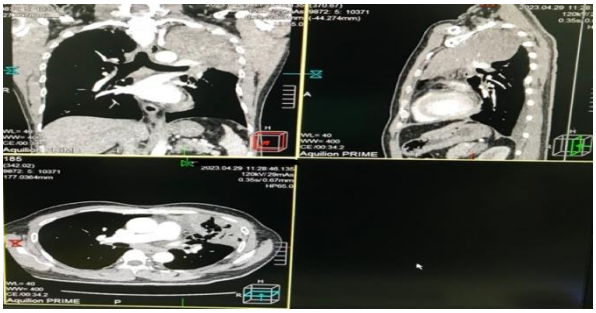
The patient is positioned supine on the examination table with feet first, the patient's hand which has been fitted with a connector or three-way is connected to the injector to make contrast administration easier.

Scanning Results

The first patient with impressions: Mass with feeding vessel sign in the right and left lungs, suspected septic embolism, DD round pneumonia DD tumor mass. Thoracic spondylosis



The second patient with the impression: Condition and fibrosis in the superior lobe of the right lung, suspected of long-standing KP, DD mass. Suggestive of linear atelectasis in the inferior lobe of the right lung. Mild bilateral pleural effusion. Minimal pericardial effusion. Mild ascites. Thoracic spondylosis



The third patient with the impression: Suggestive of a tumor of the superior lobe of the left lung with segmental and Parapneumonic Reaction DD/Lobar Pneumonia. Long-standing active TB in the right lung. Left mild pleural effusion.

The thorax CT scan examination procedure in lung tumor cases at Bhayangkara Hospital in Makassar uses a thin slice thickness because the thinner the slice thickness used, the clearer the existing pathology will be. The picture will be clear and if there are metastases or nodules they will not be missed. The use of the thinnest slice thickness is not used because it will take a very long time. As for the three cuts used, it is equally important to look at the existing cuts. Axial cuts serve as routine cuts, coronal cuts serve to help evaluate the heart and pericardial fat pads, and sagittal cuts on lung segments to determine the superior and inferior lobes

CONCLUSION

The Thorax CT Scan examination procedure in cases of lung tumors at Bhayangkara Makassar Hospital follows the existing SOP but there are differences in Slice Thickness and delay time for contrast injection. Bhayangkara Makassar Hospital uses a Slice Thickness of 3 mm, whereas in theory it uses a Slice Thickness of 5 mm - 10 mm, and uses a post-injection delay time of 35 seconds, whereas in theory it uses 45 - 70 seconds. By setting the parameters according to the SOP at Bhayangkara Makassar Hospital, it is optimal in showing the existing pathology in the patient.

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