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Scientific Publishing

Pulmonary Artery CTA and CT Abdominal Plain Enhancement One-Stop Scanning Methods and Application Value

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Abstract: Objective: To investigate the feasibility and application value of one-stop scanning method of CTA angiography of pulmonary artery and plain abdominal enhancement. Methods: In the following study, a total of two patients were selected from our hospital to undergo CTPA and plain abdominal enhancement scanning, and the feasibility of one-stop scanning was investigated by analyzing the examination parameters of the two patients. Results: The one-stop scanning method of pulmonary artery CTA and CT abdominal plain enhancement can provide accurate clinical information, shorten the examination time and reduce the use of contrast agents after parametric and clinical evaluation.

Keywords: Pulmonary Artery CTA; One-Stop Scanning Imaging; Pulmonary Embolism

1. Introduction

With the development and progress of science and technology, “one-stop” scanning and imaging has become the mainstream scanning method, how to ensure the image quality and diagnostic requirements, as well as to ensure the safety of the patient under the premise of saving the scanning time, reduce the dose of contrast medium, reduce the patient’s examination cycle has become the need to consider the matter of each technician teacher. The present study focuses on the feasibility and application value of CTPA and CT abdominal plain enhancement one-stop scanning method.

2. Information

In this study, the data of one patient with pulmonary artery CTA and one patient with CT abdominal plain enhancement were extracted from the patients examined in our hospital for comparative analysis.

The patient with pulmonary artery CTA (hereinafter referred to as patient A) is a 68-year-old man who came to our hospital for treatment of a right lung space-occupying lesion, with the following clinical diagnosis: right lung space-occupying lesion; right lung patchy shadow: tumor? Other? Lung infection: CT abdomen plain enhancement Patient (hereinafter referred to as Patient B) Male, 81 years old, came to our hospital for treatment of esophageal malignant tumor, clinical diagnosis history: esophageal malignant tumor.

3. Methods

3.1 Before performing the enhanced examination, first of all, the enhanced scanning conditions should be available: contrast infusion facilities are: high-pressure syringes, syringes, infusion devices. High-pressure syringe can be used single or double barrel, no high-pressure syringe hospitals can use ordinary syringe hand-push method or air-pressurized intravenous drip method for CT enhancement scanning. Rescue care facilities: (1) staffing: CT room personnel in addition to physicians and technicians (need to have a license), must be equipped with nurses (need to have a license), with a certain degree of first aid and cardiopulmonary resuscitation ability of nurses is particularly suitable for work in the CT room. (2) First aid cart: first aid medicines, syringes, infusion sets, wheels, oxygen tubes and blood pressure monitors should be placed in order in the first aid cart. (3) Oxygen cylinder, oxygen bag, if there is a central oxygen supply CT room should be equipped with connecting tube. (4) Emergency green channel: Due to the limited resuscitation facilities and resuscitation ability of CT room, when allergic reaction occurs, while actively resuscitating the patient, we should simultaneously ask the emergency room of the hospital or the related clinical departments for assistance, and escort the patient to the emergency center as soon as possible if necessary. Therefore, a green channel for allergy rescue between CT center, emergency center, cardiology, respiratory medicine, anesthesiology and other related departments should be established. [1]

The CT model selected for patient A was the UCT860 256-slice spiral CT of UNION, and the [Pulmonary CTA] examination sequence was chosen, with a collimation width of 80 mm, a pitch of 0.8938, a rotation time of 0.5 S, a minimum layer thickness of 0.5 mm, a dose of 120 KV, and a contrast agent of [iodophorol] (100 ml/74.1 g). During scanning, the monitoring layer was placed at the pulmonary artery, with a detection threshold of 80 HU, the first phase of the pulmonary artery phase, with a trigger time of 5-6 seconds (see below for the monitoring map), and the scanning time was about 10-15 seconds after the injection of the contrast agent, the second phase was the late arterial phase, and the scanning was performed immediately after the end of the scanning of the pulmonary artery phase, which showed a partially strengthened portal vein; all the structures of arterial supply were shown optimally. The scan time is approximately 20-25 seconds after contrast injection.

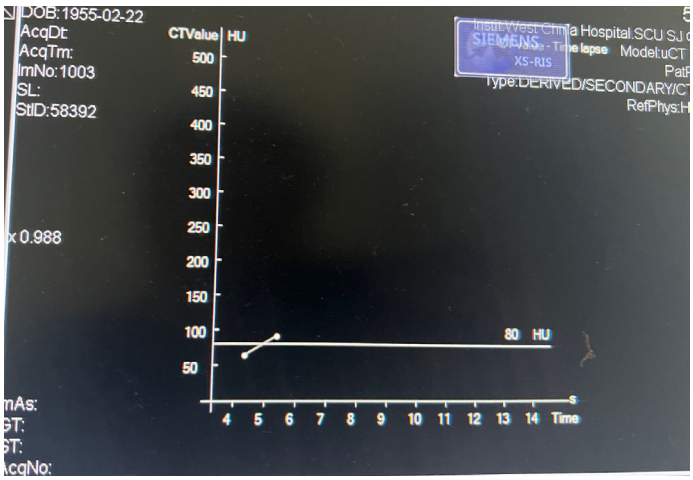

Figure 1:The patient A's Monitoring charts

The CT model selected for patient B was the UCT860 256-slice spiral CT with [Abdomen C] examination sequence, collimation width of 80 mm, pitch of 0.9937, rotation time of 0.5 S, minimum layer thickness of 0.5 mm, dose of 120 KV, and contrast agent of [iophorol] (100 ml/74.1 g). During scanning, the monitoring layer was placed at the descending aorta with a monitoring threshold of 210 HU, and the detection started after 10-12 seconds, with a trigger time of about 15 seconds (see below for the monitoring map), plus the breathing preparation and scanning time, which was approximately 18-25 seconds after contrast injection.

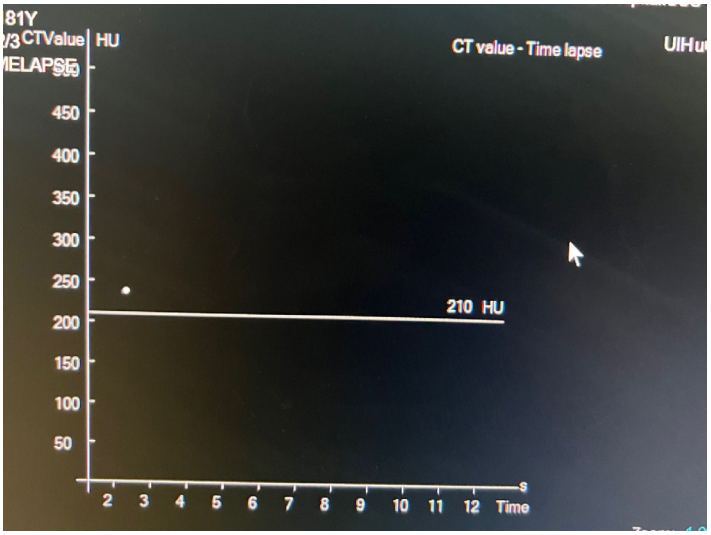

Figure 2:The patient B's Monitoring charts

3.2 "One-stop" scanning: Assuming that patient C wishes to undergo both "CTPA" and CT abdominal plain enhancement, the sequence can be changed to a first pulmonary phase, with the monitoring layer placed at the pulmonary artery, and the scanning of the chest, resulting in the pulmonary artery being visualized by the contrast and the aorta not being visualized. The aorta is not visualized. The second phase is

the aortic phase, which is scanned immediately after the completion of the first phase and covers the chest plus the abdomen, with an approximate scan time of about 20 seconds after contrast injection, resulting in visualization of both the aorta and the pulmonary arteries. The third phase is the venous phase, which takes about 1 minute and 10 seconds and covers the entire abdomen. The result is visualization of the veins.

4. Discussions

Pulmonary CTA has good clinical diagnostic significance for patients with pulmonary artery embolism. Among 31 patients with pulmonary artery embolism taken from the relevant literature, the presence of lobar and segmental pulmonary artery embolism accounted for 64.52%, the presence of segmental and subsegmental pulmonary artery vascular embolism accounted for 32.26%, the presence of embolism of both sides of the lower pulmonary arterial trunks accounted for 35.48%, and the presence of embolism of the left pulmonary arterial trunks and the right The percentage of embolization in the main trunk of left and right pulmonary arteries was 29.03%, and the percentage of embolization in segmental and subsegmental pulmonary arteries only was 19.35%. In 17 cases, the improvement rate of pulmonary embolism was 58.82%, and the thrombus clearance rate was 41.18% when the pulmonary artery CTA was performed again after 1 month to 6 months of treatment. Therefore, in the clinical diagnosis and outcome assessment of patients with pulmonary artery embolism, adopting the method of pulmonary artery CTA examination can get better results. [2] And the accuracy rate of enhanced CT in diagnosing abdominal tumors in patients (90.74%) was significantly higher than that of conventional CT diagnosis (72.22%), and the difference between the two groups was statistically significant ($P<0.05$). The accuracy of enhanced CT in diagnosing abdominal metastasis of the patient's tumor was significantly higher (94.44%) than that of CT (72.22%), and the difference between the two groups was statistically significant ($P<0.05$). The length of implant foci, width of implant foci and minimum area of implant foci in patients detected by enhanced CT were smaller than those detected by CT, and the difference between the two groups was statistically significant ($P<0.05$). Therefore, enhanced CT has good effect in diagnosing intra-abdominal metastasis of tumors in patients with abdominal tumors, which can well determine the tumor foci and metastasis status of patients, and can detect smaller tumor tissues, which has high clinical application value. [3] Since the two patients use the same concentration of contrast agent and the scanning time is approximately the same, after diagnosis and clinical assessment of the effect of the diagnostic criteria, at the same time, it can greatly reduce the amount of contrast agent, shorten the examination cycle, saving time and economic costs for patients, if there is a need for the two kinds of examination to be carried out at the same time, it can be popularized and used.

References

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