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Paper : CT procedure
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Final Term Exam -

Q1- In which circumstances a liver Triphasic Examination is performed, what is general protocol for liver triphasic Examination?

Ans:- A liver triphasic (Computed Tomography (CT) is a standardized procedure for the detection of and characterization of a large variety of benign and malignant liver lesions -

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This help in decide of mortality and morbidity rates among patient with liver diseases -

All liver tumours however get 100% of their blood supply from the hepatic artery,

⇒ Hypervascular tumour will be seen best in the late arterial phase.

⇒ Hypovascular tumours enhance poorly in the late arterial phase, difficult to differentiate from the liver parenchyma -

→ There are two procedures for hypovascular and hypervascular the general protocol for both are -

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General protocol for liver triphasic Examination-

⇒ patient position:-

- ⇒ The patient should be fasting
4 hours before the scan
- ⇒ Contrast should be given orally
- ⇒ The patient will be supine
and feet first.

Imaging protocol:-

- ⇒ Slice thickness should be
 $0.5\text{mm} \times 64$ ($1\text{mm} \times 32$)
- ⇒ pitch should be standard-
Standard pitch is 1.5
- ⇒ kVp is selected 120
- ⇒ MA is selected Exposure
3D standard
- ⇒ Rotation time will be
 0.5s (0.75s)

(4)

Scan Range:-

- ⇒ Start from lung apices in chest and from diaphragm in abdomen
- ⇒ Scan Range End from the lungs base and ischium.

Contrast:-

⇒ Volume = 70 to 130 ml

Contrast volume depend on the patient weight

⇒ Rate ⇒ Contrast should be given at the rate 2 to 4 ml contrast per second (2-4/s)

⇒ Delay:- for hypervascular -

⇒ Arterial = (25)s

⇒ portal venous = (65)s

for hypovascular -

⇒ Arterial = (35)s

⇒ portal venous = (65)s

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Image Reconstruction:-

S/Smm = Body Standard Axial

S/Smm = Lung Standard Axial

Volume = Body Standard Volume

Reformatting:-

Multiview

Coronal

Sagittal

Start

posterior

Left

End

Anterior

Right

Thickness

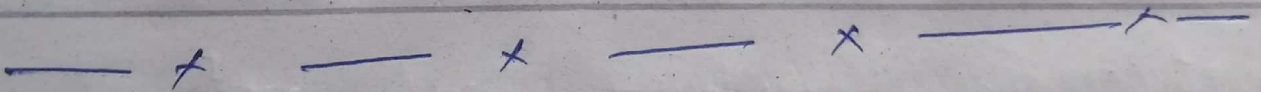
4mm

4mm

Spacing

4mm

4mm



⑥

Q2:- patient of Age 45 years
has complaint anosmia - - - -
- - - - for the Examination -

Ans:- Anosmia is know as
Smell blindness -

it is the loss of ability
to detect smell -

⇒ mostly Anosmia is caused
by sinus infection -

⇒ if a patient have complaint
anosmia we will done
CT head and neck with sinuses

Complete protocol for the
CT head and sinuses is -

⇒ patient position:-

⇒ the patient will lie supine
with head first.

Care must be taken to
positioned the head symmetrically

⇒ Always ask the patient if
there is post surgery
and when it was performed -

(7)

Imaging protocol (Sinuses. HCT 5mm to 5mm)

⇒ the slice thickness will
be 0.5mm x 64

⇒ the pitch will be detailed -

⇒ kVp will 120

⇒ MA will 150

⇒ the Rotation time will 0.5s

Scane Range:-

⇒ Start from below maxillary
sinus

⇒ End above frontal sinuses -

⇒ the plant will be parallel
to head -

Image Construction:-

5/5mm — Bone Sharp

volume — Bone Sharp

(8)

Reformatting:-

| Multiview | Coronal | Sagittal |
|-------------|--------------------------------|--------------------------------|
| ⇒ plane | perpendicular to head plate | perpendicular to head plate |
| ⇒ Start | Anterior to frontals | Middle wall of left orbit |
| ⇒ End | posterior to sphenoid | Middle wall of right orbit |
| ⇒ Thickness | 2mm | 2mm |
| ⇒ Spacing | 2mm | 2mm |

∴ if the position was not correct then the reformation should be done manually to ensure correct anatomical position -

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Q3:- A patient was presented
Chronic lower back pain - - -
- - - - - protocol for the Examination?

Ans:- Sciatica is a pain originated
along with the Sciatic
Nerve -

⇒ If the diagnosis was Sciatica
then we will do the
procedure of CT Lumbar Spine

Complete protocol for
CT lumbar Spine:-

⇒ patient position:-

⇒ The patient will lie
Supine on table with
feet first

⇒ * if the patient was unable
to lie supine then a patient →

⇒ sponge under the knee must
be kept

* should be performed in
lateral or prone position

(10)

Imaging protocol

⇒ lumbar spine 3mm (0.5mm)

⇒ The Scan Slice thickness should be 0.5mm x64

⇒ The Scan pitch will be Detail pitch

⇒ kVp will be 135

⇒ MA will be Exposure

3D High quality

⇒ Rotation time will be 1.0s to 1.5s

Scan Range:-

⇒ Levels specified, otherwise

Routine L2-S1

if the patient Age is less

than 30 year the L3-S1

- unless a specific symptoms at L2

⇒ Start above the pedicle of L2

⇒ End Below the S1

(increase scan Range for sufficient data (L5-S1) for MPR)

Image Reconstruction:-

3/3

Spine Thoracic Lumbar

3/3

Bone Standard

volume

Spine Thoracic Lumbar

Reformatting:-

The multiplanar Reformation (MPR)

Should be use for spine-



Q4:- Write the patient position and Examination protocol for the CT procedure advised for tarsal coalition?

Ans:- A tarsal coalition is an abnormal connection that develops between two bones in the back of the foot (tarsal bone)

- This abnormal connection can be composed of bone, cartilage or fibrous tissue,
- it may lead to limited motion and pain in one or both feet.
- ⇒ for tarsal coalition we will perform a procedure CT Ankle.

Complete protocol for CT Ankle
 ⇒ patient position:-

⇒ the patient will lie supine on table with feet first.

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⇒ The ankle of interest will be at centre of field of view (FOV)

⇒ The other leg will be bent up.

⇒ The ankle will be immobilized by using strips -

Image protocols: - Ankle 2m/6.5mm

⇒ The slice thickness will be 0.5mm x 64

⇒ The pitch used for ankle will be detail pitch

⇒ kVp will be 120

⇒ MA will be 100

⇒ Rotation time will be 0.5s

(14)

Scans Range:-

- ⇒ Start From Above the ankle joint
- ⇒ End on below the calcaneum
- ⇒ plane will straight gantry

Image Reconstruction:-

- 2/2mm - Bone Sharp
- volume - Bone Sharp
- volume for 3D - Soft Tissue standard-

⇒ Reformating:-

| | Coronal | Sigittal |
|-----------|------------------------|-------------------|
| plane | True Coronal | True Sigittal |
| start | Posterior to calcaneum | Lateral to fibula |
| End | Anterior to navicular | Medial to Tibia |
| Thickness | 2mm | 2mm |
| Spacing | 2mm | 2mm |

⇒ if there is fracture then 3D CT will required-

(15)

Q5:- Which CT Angiography procedure should be performed for investigation Coronary Artery Disease (CAD) Explain the complete protocol-?

Ans:- Coronary Artery disease (CAD) is the most common type of heart disease, it is the leading cause of death

⇒ CAD happen when the arteries that supply blood to heart muscle become hardened and narrow

⇒ For CAD A Cardiac Angiography is usually perform-

Complete protocol for Cardiac Angiography

patient position:-

⇒ The patient will lie supine with feet first-

⇒ The patient will up the arm above the head-

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⇒ ECG dots will be placed on the patient chest.

Imaging protocol (cardiac CTA (0.5mm))

⇒ the scan slice thickness

will 0.5mm x 64

⇒ the pitch used for cardiac angiography will determine by score Cardio TM.

⇒ the kVp will 120

⇒ the mA will 400

⇒ Rotation time will also determine by the score Cardio TM.

Scan Range:-

⇒ Start from Caring

⇒ End below apex of the heart -

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Contrast:-

⇒ The single phase contrast injection protocol will use which is -

phase 1 = xx ml at the rate of 4-5 ml/s

phase 2 (saline) = 50 ml contrast at the rate of 4.5 ml/s

$$xx = (\text{Scan time} + 10) \times \text{injection rate}$$

⇒ Scans start on descending aorta at the level of pulmonary trunk triggered at 180 HU -

Image Reconstruction -

use Image iact to determine the optimal phase for motion -

free Image -

= volume - Cardiac CTA

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Secure Cardid should be
used to ensure the
pitch, rotation speed, and
reconstruction method are
optimized for the scan-

THE END

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