AL- Mustaqpal University

Science College

Dep. Medical Biotechnology

Second Stage

Lec 11

ct-scan

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ct-scan

A computerized tomography scan, also called a **CT scan**,is a type of imaging that uses X-ray techniques to create detailed images of the body. It then uses a computer to create cross-sectional images, also called slices,of the bones, blood vessels and soft tissues inside the body.

CT scan images show more detail than plain X-rays do.

A **CT scan** has many uses. It's used to diagnose disease or injury as well as to plan medical, surgical or radiation treatment.

Why it's done

Your healthcare professional may suggest a CT scan for many reasons. For instance, a CT scan can help:

- Diagnose muscle and bone conditions, such as bone tumors and breaks, also called fractures.
- Show where a tumor, infection or blood clot is.
- Guide procedures such as surgery, biopsy and radiation therapy.
- Find and watch the progress of diseases and conditions such as cancer, heart disease, lung nodules and liver masses.
- Watch how well certain treatments, such as cancer treatment, work.
- Find injuries and bleeding inside the body that can happen after trauma.

Risks

Radiation exposure

During a CT scan, you're briefly exposed to a type of energy called ionizing radiation. The amount of radiation is greater than the amount from a plain X-ray because the CT scan gathers more-detailed information.

The low doses of radiation used in CT scans have not been shown to cause long-term harm. But for repeated scans, there may be a small increase in the lifetime risk of cancer. This can affect children more than adults.

CT scans have many benefits that outweigh any small risk. Healthcare professionals use the lowest dose of radiation to get the needed medical information. And newer, faster machines and techniques use less radiation than older CT scans did.

Harm to unborn babies

The radiation from a CT scan is unlikely to harm baby unless the scan is of the belly or pelvis. But your health professional might suggest another type of exam so that the baby isn't exposed to radiation. Exams that don't use radiation include ultrasound and MRI.

Contrast material

A special dye called contrast material is needed for some CT scans. The dye appears bright on images. So it makes certain areas of the body that are being scanned show up better. This can help make blood vessels, intestines or other structures easier to see.

Contrast material might be given:

- **By mouth.** By mouth. If your esophagus or stomach is being scanned, you may need to swallow a liquid that has contrast material. This drink may not taste good.
- **By shot, also called injection.** Contrast agents may be given through an artery or vein in the arm. A person may feel warmth or a metallic taste in the mouth when the tincture enters their body.
- **By enema.** A contrast material may be placed in the rectum to show the intestines. This action can make a person feel bloated.

Reactions to contrast material

Although rare, medical problems or allergic reactions can happen with contrast material. Most reactions are mild and result in a rash or itchiness. More rarely, an allergic reaction can be serious, even life-threatening.

How to prepare for a CT scan

- Take off some or all your clothing and wear a hospital gown.
- Remove metal objects, such as belts, jewelry, dentures and eyeglasses, that might affect image results.
- Not eat or drink for a few hours before your scan.

What you can expect

You can have a CT scan in a hospital or an outpatient facility. CT scans are painless. With newer machines, scans take only a few minutes. The whole process most often takes about 30 minutes.

During the procedure

A CT scanner is shaped like a large doughnut standing on its side. You lie on a narrow table with a motor that slides through the center of the scanner into a tunnel. Straps and pillows may be used to help you stay in place. During a head scan, the table may be fitted with a special cradle that holds your head still.

While the table moves you into the scanner, the X-ray tube rotates around you. Each time it rotates, it gives images of thin slices of your body. You may hear buzzing and whirring noises.

A healthcare professional called a CT technologist sits in another room and can see and hear you. You can talk with the technologist through an intercom. To help you keep still during the scan, the technologist might ask you to hold your breath at certain points. Movement can blur the images.

After the procedure

After the exam you can return to your regular routine. If you were given contrast dye, you may be asked to wait for a short time before leaving to make sure that you feel OK after the exam. You also might be told to drink lots of fluids to help your kidneys remove the dye from your body.

Discussion

1. **What does a CT scan primarily use to create detailed body images?**
   a) Ultrasound waves
   b) Magnetic fields
   c) X-ray techniques
   d) Laser beams
   e) Radio waves
   Answer: c) X-ray techniques
2. **What type of images does a CT scan produce?**
   a) 3D holographic images
   b) Cross-sectional images
   c) Photographic images
   d) Blurred images
   e) Surface images
   Answer: b) Cross-sectional images
3. **CT scans show more detail than which type of imaging?**
   a) MRI scans
   b) Ultrasound
   c) Plain X-rays
   d) PET scans
   e) Nuclear imaging
   Answer: c) Plain X-rays
4. **Which condition can a CT scan diagnose?**
   a) Muscle and bone conditions
   b) Psychological disorders
   c) Skin infections
   d) Sleep apnea
   e) Hearing loss
   Answer: a) Muscle and bone conditions

5. **Why might a CT scan be used during treatment?**

   a) To replace surgical procedures

   b) To guide procedures like biopsies

   c) To avoid radiation exposure

   d) To treat allergic reactions

   e) To monitor pain levels

   Answer: b) To guide procedures like biopsies

6. **What is a risk associated with repeated CT scans?**

   a) Memory loss

   b) Increased lifetime risk of cancer

   c) Skin burns

   d) Dehydration

   e) Hair loss

   Answer: b) Increased lifetime risk of cancer

7. **What kind of imaging exam is safer for pregnant women?**

   a) CT scan

   b) X-ray

   c) MRI

   d) Nuclear scan

   e) PET scan

   Answer: c) MRI

8. **What substance is sometimes used to improve CT scan images?**

   a) Iodine

   b) Contrast material

   c) Barium sulfate

   d) Calcium

   e) Saline solution

   Answer: b) Contrast material

9. **How can contrast material be administered for a CT scan?**
   a) By injection
   b) By enema
   c) By mouth
   d) All of the above
   e) None of the above
   Answer: d) All of the above
10. **What sensation might you feel when injected with contrast dye?**
   a) Cold
   b) Warmth
   c) Tingling
   d) Dizziness
   e) Numbness
   Answer: b) Warmth
11. **What allergic reaction can occur due to contrast material?**
   a) Rash or itchiness
   b) Coughing fits
   c) Vision loss
   d) Hair loss
   e) Frequent urination
   Answer: a) Rash or itchiness
12. **What should you remove before a CT scan?**
   a) Watches
   b) Jewelry
   c) Dentures
   d) All of the above
   e) None of the above
   Answer: d) All of the above

13. **What is the shape of a CT scanner?**

    a) A cube

    b) A tunnel

    c) A large doughnut

    d) A sphere

    e) A flat table

    Answer: c) A large doughnut

14. **How long does a CT scan procedure usually take?**

    a) Less than 5 minutes

    b) About 10 minutes

    c) About 30 minutes

    d) Over an hour

    e) Several hours

    Answer: c) About 30 minutes

15. **What noises might you hear during a CT scan?**

    a) Loud alarms

    b) Buzzing and whirring

    c) Clicking sounds

    d) Soft music

    e) Complete silence

    Answer: b) Buzzing and whirring

16. **What might the CT technologist ask you to do during the scan?**

    a) Hold your breath

    b) Move frequently

    c) Keep talking

    d) Stand still

    e) Close your eyes

    Answer: a) Hold your breath

17. **Why might you be asked to drink lots of fluids after a CT scan?**

a) To recover energy

b) To flush out the contrast material

c) To hydrate the brain

d) To reduce fatigue

e) To improve digestion

Answer: b) To flush out the contrast material

18. **What preparation is needed for a CT scan of the stomach?**

a) Wear heavy clothing

b) Eat a large meal beforehand

c) Swallow a liquid with contrast material

d) Avoid resting before the scan

e) Avoid drinking water for days

Answer: c) Swallow a liquid with contrast material

19. **What ensures clear imaging results during a CT scan?**

a) Use of special lighting

b) Absolute stillness

c) Use of headphones

d) Keeping eyes open

e) Closing the scanner lid

Answer: b) Absolute stillness

20. **What can a CT scan detect in the case of trauma?**

a) Surface cuts

b) Internal injuries and bleeding

c) Psychological distress

d) Fever

e) Muscle fatigue

Answer: b) Internal injuries and bleeding