- What is Radiology?

  In the past, when talked about radiology we only think about diagnostic x-ray uses

  Today, diagnostic imaging methods such as computed tomography, magnetic resonance, nuclear medicine and ultrasonography have emerged.

  Therefore, all these diagnostic techniques should be understood when said RADIOLOGY.

- So why diagnostic imaging is so important?

  The vast majority of diseases are manifested by different clinical reflections.

  At the end, all of these «anamnesis, clinical and physical examination findings of the patient and numerous other diagnostic methods» and RADIOLOGICAL EXAMINATION are important aid methods for diferantial diagnosis.

  Radiological Imaging, as is sometimes seen in the diagnosis of orthopedic diseases; is an important diagnostic tool and it can be more important than other diagnostic methods and may be sufficient for the diagnosis of a disease alone.

  In this course, we will learn how different imaging modalities can help patients and us.

- RADIOLOGICAL IMAGING METHODS

  After the discovery of X-ray and x-ray film; radiology has been an integral part of medicine, particularly surgery.

  In the following years, many radiological imaging methods have been demonstrated. Developments in computer technology are also transferred to imaging methods; Modern methods have been developed, which have been in use for many years and have become increasingly popular nowadays.

- Radiography----------»convensional methods
  Radioscopy – Skopi----------»

  scintigraphy----------»
  Computed tomography (CT)----------»modern methods
  Magnetic Resonance Imaging (MR)--»

  Ultrasonography
  thermography

- Radiological Imaging Methods

  The main radiological imaging methods which used today are;

  - X-ray
  - Computed Tomography
  - Magnetic Resonance Imaging
  - Ultrasonography
  - Radionuclide Imaging (scintigraphy)
- They can be examined under 5 main headings.

  Nowadays, with the development of computer technology, x-ray has a sub-group such as digital x-ray.

- Energy and the image receiving systems used in these imaging methods is different based on different physical principles also different contrast agents often used to enhance the image quality.

- - Emission

  - Transmission

  - Reflection

- Emission
  In this imaging method, the energy source is in the body. The energy released from the body must be acquired and processed to generate the image.

  In order to generate energy in the body, a number of radionuclide agents must be delivered to tissues and organs in different ways, such as in radionuclide imaging.

  As with magnetic resonance imaging (MR), it is necessary to stimulate tissues with radiofrequency

- Transmission

  The energy used in imaging methods based on this principle; must pass through the organism and reach the recipient of the opposite side. Here the energy source and the receiver are different.

  This principle applies in X-ray and computed tomography method.

- Reflection

  In this principle; the energy source and the receiver are on the same side. After the produced energy is sent to the organism, the energy reflected by striking the tissues and organs is collected again to create the image.

  Ultrasonography works according to this principle.

- Diagnostic Radiology - Radiography

  Here, the images are obtained using x-rays. X-rays obtained from the x-ray tube pass through the patient and reach the x-ray film or special recipients. This process is called RADIOGRAPHY.

  With radiography, the image recorded on the film is called a "radiogram" or "radiograph". Specially used films used in diagnostic radiology are called "radiography film"

  The location, size, shape and density of the structure are examined and evaluated by radiography.

- Fixed images can be displayed in X-ray film, special cassette or digital media

  Moving studies can be performed by fluoroscopy. The images can be viewed in real time

  Radiography; is a two-dimensional image based on three-dimensional bodies, density and shapes

- The bones in the organism have a more dense structure than soft tissues and can be easily visualized by direct (plain) radiography as they have less X-rays.

  The abdominal organs such as esophagus, stomach, intestines, liver and kidney has similar dansities and they cause superposition on each other because they are anatomically coexisting. In addition, there are some difficulties in evaluating the radiographs and diagnosing diseases because they do not have enough contrast on the radiogram.

  For this reason, artificial densities are created in such organs so they can be seen different from similar organs in the environment. This process is called contrast radiography.


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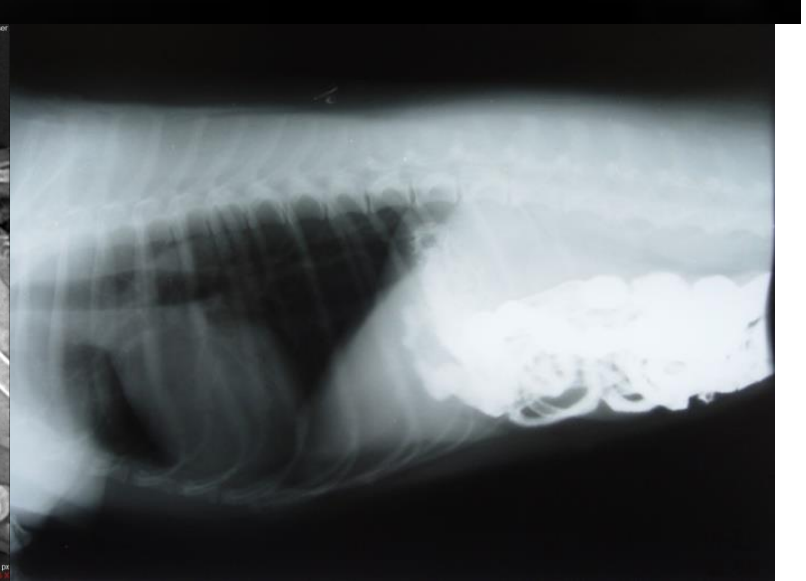

- Indications for radiography;

  Identification of a specific condition
  Evaluation of the spread of a disease or pathological formation
  Follow-up of a disease or pathological formation after treatment

- Ultrasonography

- Diagnostic ultrasound uses high frequency sound waves to produce an image of the body. The fundamental principle of diagnostic ultrasound is that sound waves pass through the tissues and are either reflected, refracted or absorbed. The sound waves which return to the transducer are responsible for producing the image.

- The size, shape, echogenicity (bright spots and dark spots) and position of structures examined by ultrasonography

  Anatomical structures within the body are evaluated.

  Images moves during ultrasound and ultrasound waves cannot pass to air or bone

  The experience of the physician and the knowledge of anatomy is very important in ultrasonographic examination