A study conducted by Lin, et al., 2020, reported on the value of CT images in the course of diagnosing an asymptomatic novel coronavirus pneumoniae (COVID-19) patients. In this patient with laboratory-confirmed COVID-19, CT findings preceded symptoms and included bilateral pleural effusions, previously not reported in association with COVID-19. A study conducted Zhang, et al., 2020, reported on the use of chest CT images to diagnose pneumomediastinum in association with diabteic ketoacidosis in diabteic patients. A study conducted by He, et al., 2020, reported on the use of CT imaging in the diagnosis of early-stage lung adenocarcinoma, which os manifested as isolated pulmonary nodules and ground glass nodules on CT. CT scans produce detailed images of many structures inside the body, including the internal organs, blood vessels and bones. CT scans can be used to diagnose conditions including; damage to bones, injuries to internal organs, problems with blood flow, stroke, and cancer.

CT advantages

Advantages of CT include; the production of a three dimensional image compared to x-ray which gives only a two dimensional image, application to all parts of the body, ability to differentiate between soft tissues, excellent for use in delineation of bone disease, high resolution of up to 0.1mm which is much higher than the resolution obtained through x-ray or ultrasound (0.5mm) imagine, faster imaging (minutes) in comparison to MRI (minutes to hours), and relative inexpensiveness compared to MRI.

CT disadvantages

Disadvantages of CT scans include; the use of ionizing radiation, especially in comparison to x-rays as CT uses a higher dose of radiation, relative expensive equipment required especially in comparison to ultrasound and x-ray imaging, slower imaging in comparison to ultrasound (seconds to minutes), lower patient in comparison to ultrasound and x-ray imaging, and potential toxicity of intravenous contrast agents.

MRI principles

All atomic nuclei consist of protons and neutrons, with a net positive charge. Certain atomic nuclei possess a property known as spin dependent on the number of protons. The nucleus spins around its own axis inducing a magnetic movement, generating a local magnetic field with north and south poles. Application of a strong, external magnetic field (B0) alings the nucleus either in parallel with or perpendicular to the external field. Nuclei that possess spin can be excited within that static magnetic field, by application of a second radiofrequency (FR) magnetic field (b1) applied perpendicular to B0. The absorption of energy by the nucleus causes a transition from higher to lower energy levels and vice versa on relaxation. The energy absorbed and subsequently emitted by the nucleus induces a voltage that can be detected by a coil of wire, amplified and displayed as the free induction decay (FID). multiple FR pulses are applied to obtain multiple FIDs, which are then averaged to improve the signal-to-noise ratio (SNR). the signal- averaged FID is a time-domain signal. It will be made up of contributions from different nuclei within the environment being studied. The signal-averaged FID can be resolved by a mathematical process into either an image (magnetic resonance image (MRI), or a frequency spectrum, providing biochemical information. MRI scanners use cryogenic superconducting magnets 15. Tesla or 3 Tesla. Relaxation described the process by which a nuclear spin returns to thermal equilibrium after