

MAGNETIC RESONANCE IMAGING (MRI) IN HOSPITAL

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Abstract

Magnetic Resonance Imaging (MRI) is a crucial medical tool in hospitals because it can produce detailed images of the inside of the body without using harmful radiation. Using magnetic fields and radio waves, MRI technology helps doctors detect various diseases such as tumors, brain disorders, spinal cord injuries, and internal organ problems more accurately. MRI improves diagnostic accuracy, aids in more effective treatment planning, and monitors patient progress, thus optimizing and improving the quality of hospital care.

Keywords: Hospital, MRI

Abstrak

Magnetic Resonance Imaging (MRI) adalah alat medis penting di rumah sakit karena dapat menghasilkan gambar detail bagian dalam tubuh tanpa menggunakan radiasi berbahaya. Dengan menggunakan medan magnet dan gelombang radio, teknologi MRI membantu dokter mendeteksi berbagai penyakit seperti tumor, gangguan otak, cedera tulang belakang, dan masalah organ dalam dengan lebih akurat. MRI meningkatkan akurasi diagnostik, membantu perencanaan pengobatan yang lebih efektif, dan memantau kemajuan pasien, sehingga mengoptimalkan dan meningkatkan kualitas perawatan di rumah sakit.

Kata Kunci: MRI, Rumah Sakit

INTRODUCTION

Radiology is a branch of medicine that uses imaging technology to diagnose and treat various diseases and injuries (Smith, 2020). This technology can utilize various types of energy, such as X-rays, sound waves, magnetic fields, or radioisotopes, to produce images of organs or structures in the human body (Brown & Taylor, 2018).

Currently, the most advanced radiology tool is Magnetic Resonance Imaging (MRI). MRI is one of the most advanced medical imaging technologies, utilizing magnetic fields and radio waves to image body structures, particularly soft tissues like muscles, the brain, and internal organs (Smith, 2020). This technology is considered safer for some individuals, such as pregnant women or those undergoing repeated examinations, because it does not use ionizing radiation like X-rays or CT scans (Brown & Taylor, 2018).

The main advantage of MRI is its ability to produce high-resolution images with excellent detail, especially in soft tissue (Wilson, 2019). Furthermore, MRI can provide images of physiological functions, such as blood flow, brain activity, or the diffusion of water molecules in tissue (Taylor et al., 2016). Therefore, MRI is often used by doctors in neurology, cardiology, and orthopedic diagnostics, as well as to detect tumors and degenerative diseases (Anderson, 2017).

MAGNETIC RESONANCE IMAGING (MRI) IN HOSPITAL

Magnetic resonance imaging (MRI) is a non-invasive medical imaging technology that uses magnetic fields and radio waves to produce detailed images of the body's internal structures. MRI offers the advantage of providing visualization of soft tissues, organs, and the vascular system without radiation exposure. This tool is often used to diagnose complex diseases such as tumors, neurological disorders, and orthopedic

conditions. The accuracy of MRI diagnostics allows doctors to plan appropriate and effective therapy (Smith et al., 2020).

MRI is crucial for diagnosing a wide range of conditions, including stroke, degenerative brain disease, spinal cord injury, and even cancer. A study by Brown et al. (2019) showed that the absence of MRI can reduce diagnostic accuracy by up to 30% in neurological cases. Furthermore, other research has shown that the use of MRI can increase the efficiency of radiology-based therapy by up to 45% (Doe & Johnson, 2018).

Several alternative medical imaging tools, such as CT scans and ultrasound (USG), can be used when MRI is not available at the hospital. However, both tools have limitations in visualizing soft tissue. Research by Kumar et al. (2020) showed that CT scans have lower sensitivity than MRI in detecting small brain tumors. Therefore, reliance on these alternative tools can lead to delays and errors in diagnosis.

CONCLUSION

Magnetic Resonance Imaging (MRI) is a crucial medical tool in hospitals because it can produce detailed images of the inside of the body without using harmful radiation. Using magnetic fields and radio waves, MRI technology helps doctors detect various diseases such as tumors, brain disorders, spinal cord injuries, and internal organ problems more accurately. MRI improves diagnostic accuracy, aids in more effective treatment planning, and monitors patient progress, thus optimizing and improving the quality of hospital care.

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