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Short Communication

MRI in Orthodontics

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Magnetic resonance imaging (MRI) was introduced as a clinical tool in the early 1980's and since then its progress has been phenomenal. The degree of blackness, whiteness or tone of gray depends on the composition of the anatomical structure being imaged. In MRI, appearances of the images generated are not only dependent on the inherent tissue properties, but also on operator. Selected variables such as pulse sequences and instrumentation factors such as magnetic field strength. The MR imaging process can be divided into a few simple steps.

1. The patient is placed in a magnetic field and essentially becomes a magnet.
2. A radio wave is sent in.
3. The radio wave is turned off.
4. The patient emits a signal
5. The signal is received and used for reconstruction of the picture.

The important hardware components of a typical MR machine can be added to this simple frame work. The patient is placed in the main magnet, which produces an external magnetic field, made more uniform by smaller "shim" coils. Transmit radio frequency (RF) coils send radio waves into the patient while receiver (rf) coils receive the signals emitted from the patient, these coils are also known as surface coils e.g. Head, body, spine, T.M.J. Image processing and display are done by a computer.

The accuracy of clinical diagnosis of normal and abnormal disc position has been reported to be 73% with M.R.I. The M.R.I. Scanning can be used to determine the relationship of the Disc to the condyle. The location of reference points in 3 dimensions for Radiographic Cephalometry can be done with M.R.I. with respect to imaging of the human skill. The availability of 3-D, Reconstruction of data from CT and MRI scans provide. The most realistic means of visualizing structures. MRI can be used to collect growth data without exposing the patient to radiation hazards. MRI can be used to assess tongue volume correctly. They are superior to cephalograms and other imaging techniques for the estimation of oropharynx and hypopharynx sizes.

Although a dentist or a Radiologist interpret Radiographs, MR images are analyzed because they represent a computation of data analyzed by a Radiologist. In the MR images of the Jaws, the extent margin and to some degree, composition of contents of an abnormal Area can be analyzed with some accuracy. Many clinicians compare MRI findings with plain radiographs to determine the histological nature of the abnormality. In the future, using software (Analytical) the molecular composition of an area can be analyzed for specific disease processes and histological diagnosis. Spatial Resolution of MRI is lower and examination time longer. Examination is not conveniently extended from one organ to another or from one part of the body to another. Contact involvement arising from bone tissue are not always demonstrable. Patients with pacemakers must be excluded. It is not easy to subject seriously ill patients, those connected to support apparatus or those under G.A. to an MR Examination. Greater tissue contrast. Ease with which views in any place are obtained. The absence of artifacts due to bone or air.

Generally, it is agreed that MRI was the most important innovation in Diagnostic imaging in the 1980's. Its immense value in the diagnosis of CNS pathologies, in particular is beyond doubt. Its utility in many extra neurological contexts needs to be carefully examined and compared with that of longer established diagnostic methodologies. The costs of MR, its intrinsic limitations, and as yet unsettled problems of hazards should be weighted. Despite the diverse image acquisition technologies currency available, standards have to be adopted in an effort to balance the anticipated benefits with the associated costs and risks [1,2].

Bibliography

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