Kontrol kualitas citra MRI menggunakan Spherical Magphan Phantom = Image quality control of MRI using the Spherical Magphan Phantom

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Abstrak

Perkembangan teknologi pada bidang radiologi saat ini sudah semakin pesat, salah satunya ditandai dengan munculnya sistem pencitraan Magnetic Resonance Imaging (MRI). Semakin modern teknologi MRI bukan berarti jauh dari kerusakan, namun tetap saja kemungkinan tersebut dapat terjadi, yang akhirnya akan mempengaruhi hasil diagnosa. Itu sebabnya perlu adanya program kontrol kualitas oleh fisikawan medis untuk menjamin kualitas kinerja pesawat MRI. Penelitian ini dilakukan untuk menguji kualitas citra pesawat MRI GE Signa HDXt 1.5 Tesla menggunakan Spherical Magphan Phantom dengan variasi teknik akuisisi pembobotan T1 (TR=160 ms, TE=13 ms), pembobotan T2 (TR=1380 ms, TE=83 ms), dan pembobotan proton density (PD) (TR=880 ms, TE=38 ms).
Dari hasil penelitian yang meliputi uji geometri irisan scan, uji pemilihan irisan scan, uji sensitometri, uji uniformitas, uji resolusi kontras tinggi, uji distorsi geometri, dan uji sensitivitas kontras rendah, dapat disimpulkan bahwa pesawat MRI yang digunakan masih dalam kondisi baik dan memiliki kesesuaian dengan standar yang direkomendasikan oleh American College of Radiology (ACR). Dari hasil perbandingan tiga teknik akuisisi citra yang digunakan, teknik pembobotan T2 (TR=1380 ms, TE=83 ms) memberikan hasil yang paling baik dalam pengujian kontrol kualitas citra MRI menggunakan Spherical Magphan Phantom.
.....Technological developments in the field of radiology is now growing rapidly, one of which is marked by the emergence of imaging systems Magnetic Resonance Imaging (MRI). The more modern MRI technology does not mean a lot of damage, but still, that possibility can occur, which ultimately will affect the diagnosis. That's why there is need for a quality control program by medical physicists to ensure the performance quality of MRI plane. The study was conducted to test the quality of the image plane GE Signa MRI 1.5 Tesla using a Spherical HDXt Magphan Phantom with T1 weighting variations acquisition techniques (TR = 160 ms, TE = 13 ms), T2 weighted (TR = 1380 ms, TE = 83 ms), and weighted proton density (PD) (TR = 880 ms, TE = 38 ms).
From the research that includes the geometry test scan slices, slice selection scan test, test sensitometri, test uniformity, high contrast resolution test, the test geometry distortion, and low contrast sensitivity test, it can be concluded that MRI is used aircraft is still in good condition and has a compliance with the standards recommended by the American College of Radiology (ACR). From the comparison of three image acquisition technique used, the technique T2 weighted (TR = 1380 ms, TE = 83 ms) to give the best result in the MRI image quality control testing using Magphan Spherical Phantom.