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Joint Replacements Exploits Magnetic Resonance Imaging

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Image Article

Joint arthroplasty is a clinical procedure that has been performed on millions of patients all over the world with great success, reducing pain and improving function. Embed disappointment, nonetheless, because of such factors as releasing, contamination or unfriendly tissue response, requires amendment medical procedure, which is related with expanded dreariness. Brief acknowledgment of difficulties around equipment is along these lines clinically applicable.

The acquisition of nonfat-suppressed, high resolution, fluid-sensitive techniques that permit the detection and characterization of periprosthetic fluid collections is necessary for the optimization of pulse sequences in the presence of regional field inhomogeneity [1]. Susceptibility artifact and low signal-to-noise ratio make it difficult to use conventional MR methods. Susceptibility artifacts, such as $T2^*$ dephasing, slice and read-out encoding distortions, signal loss and in-plane distortions, will be discussed in detail. Newer pulse sequences designed specifically to reduce artifacts, such as Slice Encoding for Metal Artifact Correction (SEMAC) and Multi-Acquisition Variable-Resonance Image Combination (MAVRIC) will be discussed along with a variety of techniques that reduce artifacts when visualizing both the bone and soft tissue envelope surrounding joint replacements [2]. Examples of typical complications associated with orthopaedic instrumentation and arthroplasty such as infection, loosening, adverse local tissue reaction, and neurovascular impingement, will be provided to illustrate the clinical application of these imaging techniques (Figure 1).

Figure 1: Replacement of Joint.

Data demonstrating the high predictive value of MRI as a biomarker of adverse tissue reactions to implants will be presented, as will a discussion of the biology of implant-related adverse tissue reactions.

Acknowledgement

None

Conflict of Interest

None

References

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