

Magnetic resonance imaging of the prostate

Ressonância magnética da próstata

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The present issue of **Radiologia Brasileira** presents an interesting article aimed at offering radiologists an overview about magnetic resonance imaging (MRI) of the prostate⁽¹⁾. MRI has been utilized since the early years of the eighties for the diagnosis of prostate cancer. The first studies reported the identification of prostate cancer as focal areas with hypointense signal on T2-weighted sequences. Even utilizing mid-field or low-field equipment and body coils, a new, exciting and enthusiastic possibility emerged as a noninvasive method for the diagnosis of prostate cancer and, maybe, a new hope for men who could not endure the digital rectal examination and biopsy...⁽²⁾.

Already by the mid eighties, the zonal anatomy of the prostate could be better demonstrated by high-field and high-gradient equipment. Most tumors were seen as hypointense nodules in the peripheral zone that presents signal hyperintensity. Late in the eighties, several investigators evaluated the possibility of local staging, despite the utilization of body coils. Again, the results seemed to be amazing, or ...optimistic?... achieving 90% accuracy! However, in the nineties, the optimism turned into disappointment with more realistic results demonstrating the low capacity of the method for staging extracapsular invasion⁽²⁾.

In 1986, the introduction of endorectal coils, in the University of Pennsylvania, represented an effort to increase the local signal intensity and resulted in a great improvement in the spatial resolution. The optimism was back...⁽³⁾.

From that moment on, the metabolic study of the prostate by spectroscopy could be developed. The history repeated once again; the first enthusiastic results advocated not only that was the issue regarding staging definitely resolved, but also that the screening for cancer should be performed with MRI. Again, men could count on an additional diagnostic imaging method in the propedeutic arsenal. This method was immediately accepted by the urologists and included in the routine imaging protocols.

The MRI and spectroscopy accuracy is “radiologist’-dependent. Many centers have compared and still compare surgical findings with the radiological evaluation in an attempt to audit their own services. The learning curve is relatively long and depends on the training of the radiologist.

The signal patterns of adenocarcinoma, hyperplasia and prostatitis still may overlap each other, but several study groups have demonstrated that there are significant metabolic differences allowing their differentiation; therefore, combined MRI

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and spectroscopy increases the method accuracy. However, the utilization of this method is still restricted to reference institutions⁽⁴⁾.

Screening for prostate cancer represents a problem completely different from a loco-regional evaluation of a known neoplasm. This method must provide a cancer or non-cancer diagnosis with high sensitivity and high specificity. Additionally, the method must differentiate cancer from prostatitis and hyperplasia, besides the typical variations⁽⁵⁻⁷⁾.

Also, for a prospective evaluation of the spectroscopy clinical utility, it is necessary to understand the rationale of how the metaboloma, in the genomic and proteomic era, offers a potentially powerful tool. One can simply consider metabolites as a final product of proteomic and genomic alterations. Furthermore, with the advantage that metabolites constitute the obvious path/steps of the ubiquitous cellular processes.

Diffusion and perfusion imaging are also added to spectroscopy in the functional evaluation of the prostate, with similar history and results.

Despite this spectrum of possibilities, we are still confronted with comments such as "I'm tired of reading articles with exaggerated false promises."

Even with the current limitations, in the future we will certainly be able to offer a golden-standard-like method for the diagnosis of prostate cancer!!!

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