RSNA 2014: South Building, Hall A, Booth 1934

Magnetic resonance imaging (MRI) brings new levels of diagnostic accuracy in patients suspected of prostate cancer

The latest clinical data shows that a simple MRI examination can rule out prostate cancer with more than 89 percent certainty\(^1\), and it provides a highly accurate classification of the disease. That makes prostate MRI the most reliable procedure in prostate cancer diagnostics currently available. SEEit\(^2\), the new solution from Siemens for prostate MRI enables this examination to be made as comfortable as possible: powerful coil technology (Body 60\(^3\) and Tim 4G) and unique applications (RESOLVE) allow a non-invasive examination in less than ten minutes measuring time.

**Medical facts on prostate cancer**

One in every six men\(^4\) will develop prostate cancer during his lifetime. Prostate cancer is also the second highest cause of cancer death amongst men in both the United States and the European Union. Definite diagnosis at an early stage is vital for survival. A treatment in an early stage also minimizes the risk of adverse effects, such as incontinence, erectile dysfunction, or impotence. These can affect about one-third of all treated patients. Latest studies also show, however, that many patients with mild forms of the disease (known as indolent carcinoma) seem to undergo excessive treatment, a consequence of inadequate classification of the disease prior to therapy with the commonly used diagnostic tools.

---

2. 510(k) pending
3. 510(k) pending
Current care scenario
Patients with a rising PSA (prostate-specific antigen) value usually undergo a transrectal ultrasound (TRUS)-guided biopsy, which typically involves sampling of tissue from twelve (sometimes six or as many as 24) points in the prostate in accordance with an established pattern. The probability of detecting a carcinoma using this method is only about 50 percent, since ultrasound shows the prostate itself but often does not reveal the position of a carcinoma. Therefore, critics often describe this procedure as a “blind biopsy.”
A consequence of this scenario is that it may take two or more years before a definite diagnosis is obtained. In the US alone, about one million men undergo this procedure each year, some 38 percent of them more than once.

Magnetic resonance imaging improves diagnostic safety
In a context of very high incidence, relatively low mortality, non-reliable prognostic markers, and a still relatively high probability of treatment-induced morbidity, leading urologists are calling for a non-invasive and reliable method to detect or rule out prostate carcinomas. MRI is thought to be the most promising method.
Multi-parametric prostate MRI, which enables physicians to probe tissue parameters such as cellular density (with diffusion-weighted imaging) in addition to being able to depict the anatomical features, is currently the most reliable procedure available to either classify a prostate carcinoma (if present) or to rule it out. Recent studies suggest that this can be done with more than 89 percent certainty, which means that a patient with a negative MRI result does not need to undergo any further biopsy.
In the past, however, there have been a number of reasons why MRI has not been a focus of attention in prostate cancer diagnosis. It is considered a very time-consuming and demanding examination that tends to be restricted to academic facilities. It also requires the application of a receiver coil (similar to an ultrasound transducer) in the patient’s rectum. Also, because of the volume of data and the need to process it, evaluating the results has been a very demanding task for the treating physician, and the results were often difficult for the referring urologist to interpret.
Powered by Siemens’ new 510k cleared software architecture syngo MR E11, the new SEEit\(^5\) solution offers a method to make this examination as comfortable as possible for the patient. It enables an accurate diagnosis, which can enable prostate cancer to be classified at an early stage, or ruled out with an excellent certainty. A combination of highly refined body coils and dedicated software applications helps to shorten the examination time to ten minutes and makes the use of endorectal coils superfluous. syngo.via, Siemens’ solution for reading and reporting imaging examinations, supports the radiologist in the process of data analysis. Findings can be reported according to the standardized PI-RADS classification and the location of cancer-suspicious foci is intuitively visualized in a schematic drawing of the prostate. This helps referring urologists in interpreting the results and provides them with the best possible support for further examinations and treatment.

**Paradigm shift in early diagnosis of prostate cancer**

The acceptance of new medical services always depends on decisions by the national healthcare authorities. Prostate MRI scans were not mentioned in any form in most national guidelines even just a few years ago, e.g. in the UK’s “National Institute for Health and Care Excellence (NICE) Guidelines” (2008). Now, there are clear recommendations for prostate MR examinations (comprising T2 and diffusion-weighted measurements) first if clinical suspicion remains following the initial biopsy (NICE 2014). If the result of this examination is negative, no further biopsy should be performed. If a suspicious region is identified in the MRI, a targeted biopsy should be taken, for example, under MR-guidance or in the form of an MR-ultrasound-fusion biopsy. Similar recommendations are in place in the Netherlands and Sweden, and have been issued by the European Society for Urological Imaging (ESUI). And some guidelines go even further: for example, the London Cancer Association’s “Best Practice Pathway” recommends an MRI scan when prostate cancer is first suspected (i.e. in the presence of an elevated PSA value) - even before a biopsy is taken. These recommendations have been adopted by – among others – a major British insurance company (BUPA), which has prepared an open letter to its clients in which it recommends not undergoing a biopsy before a prostate MRI has been performed. In conclusion, a paradigm shift in early diagnosis of prostate cancer can be observed in which MRI can develop its full potential.

\(^5\) 510(k) pending
Captions

(Permission: Siemens AG, Munich/Berlin; pictures must bear the credit www.siemens.com/press)

**Body 60 coil**
New Body 60 coil for optimized coverage of the pelvis and improved signal

**3D morphology imaging of the prostate**
Non-invasive 3D morphology imaging of the prostate in 4:58 minutes

**Diffusion-weighted imaging of the prostate**
Non-invasive diffusion-weighted imaging of the prostate with RESOLVE in 4:20 minutes

**MRI findings**
Standardized and easy communication of MRI findings with reporting tool according to PI-RADS

This background information and press pictures are available at www.siemens.com/press/rsna2014.

**Contact for journalists**
Thorsten Opderbeck
Siemens AG
Healthcare
Phone: +49 9131 84-4906; E-mail: thorsten.opderbeck@siemens.com

Follow us on Twitter at: www.twitter.com/siemens_press

Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for more than 165 years. The company is active in more than 200 countries, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is No. 1 in offshore wind turbine construction, a leading supplier of combined cycle turbines for power generation, a major provider of power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. The company is also a leading provider of medical imaging equipment – such as computed tomography and magnetic resonance imaging systems – and a leader in laboratory diagnostics as well as clinical IT. In fiscal 2014, which ended on September 30, 2014, Siemens generated revenue from continuing operations of €71.9 billion and net income of €5.5 billion. At the end of September 2014, the company had around 357,000 employees worldwide. Further information is available on the Internet at www.siemens.com.