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Advancing women's imaging through collaboration

GE HealthCare and the University of California San Diego School of Medicine have entered into a collaboration aimed at enhancing imaging techniques for female-specific diseases, with a focus on pelvic conditions. This project, spearheaded by Rebecca Rakow-Penner, MD, PhD, Associate Professor of Radiology and Bioengineering at UC San Diego and Co-Director for the Center for Translational Imaging and Precision Medicine, aims to develop advanced MR imaging protocols and educational resources that will improve diagnosis and care for women experiencing complex pelvic health issues.

Addressing an underserved area in women's health

Historically, the diagnosis and treatment of female pelvic conditions such as endometriosis, uterine fibroids and pelvic inflammatory disease have been delayed or overlooked, largely due to the complex nature of these conditions and the limited imaging protocols available to clinicians. Dr. Rakow-Penner's goal is to democratize access to advanced imaging for women and provide standardized protocols and best practices for radiologists to improve diagnostic accuracy.

In this collaboration, GE HealthCare is providing its latest imaging technologies, and together with Dr. Rakow-Penner and her team at UC San Diego, they are working on optimizing MR protocols to enhance SNR and image resolution while also reducing scan times. This will significantly impact how female pelvic conditions are diagnosed and treated, especially for diseases like endometriosis,

which is notoriously difficult to diagnose due to its varied presentation and often subtle signs.

Optimizing MR protocols for pelvic diseases

One of the initial goals of the collaboration is to improve MR protocols specifically for diagnosing endometriosis. With symptoms that often overlap with other conditions, such as irritable bowel syndrome or pelvic inflammatory disease, endometriosis has traditionally been difficult to detect through imaging. This often leads to delayed diagnosis and mismanagement of the condition. To address this, the team at UC San Diego is investigating advanced technologies such as AI-based imaging enhancements like AIR™ Recon DL and 3D imaging techniques to provide higher resolution images that can detect even the most subtle signs of the disease.

"The ability to visualize endometriosis more clearly through MR, without the need for exploratory surgery, is a game-changer," says Dr. Rakow-Penner. "By optimizing these protocols, we can provide radiologists with specific guidelines on what to look for, improving detection and treatment of this challenging condition."

Reducing variability and increasing efficiency

In addition to enhancing diagnostic accuracy, a major focus of the collaboration is efficiency. Dr. Rakow-Penner emphasizes the need to reduce MR scan times without sacrificing image quality. "If we want to democratize MR, we have to be efficient with our time," she says. The goal is to create protocols that are not only accurate

but also efficient, making advanced MR accessible to more healthcare facilities, particularly those with fewer resources.

Currently, the team is focused on minimizing variability between patients by standardizing the collection of imaging data. Together with GE HealthCare's Arnaud Guidon and Adam Casebolt, Dr. Rakow-Penner is optimizing female pelvis MR protocols to improve resolution and SNR while also reducing scan times.

This consistency will not only improve diagnostic outcomes but also streamline the application of AI in imaging analysis. AI holds promise in automating certain diagnostic processes, further reducing the burden on radiologists and improving patient throughput.

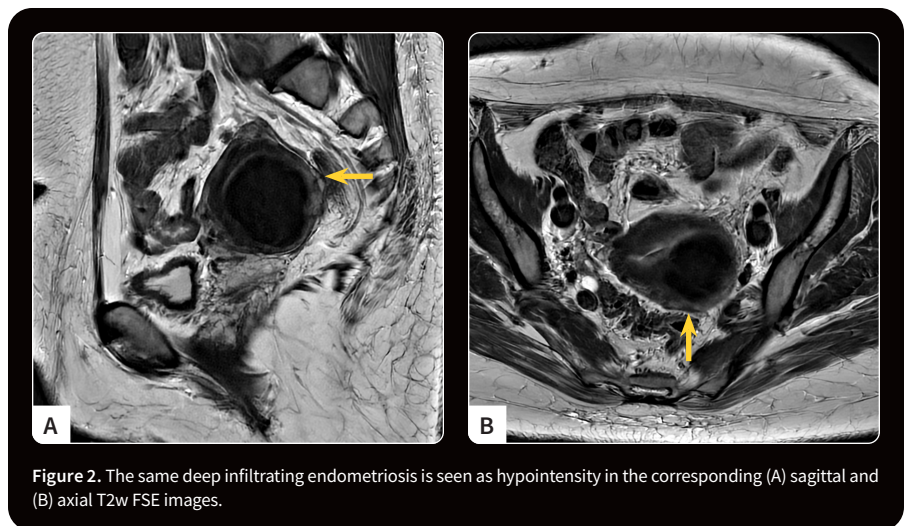
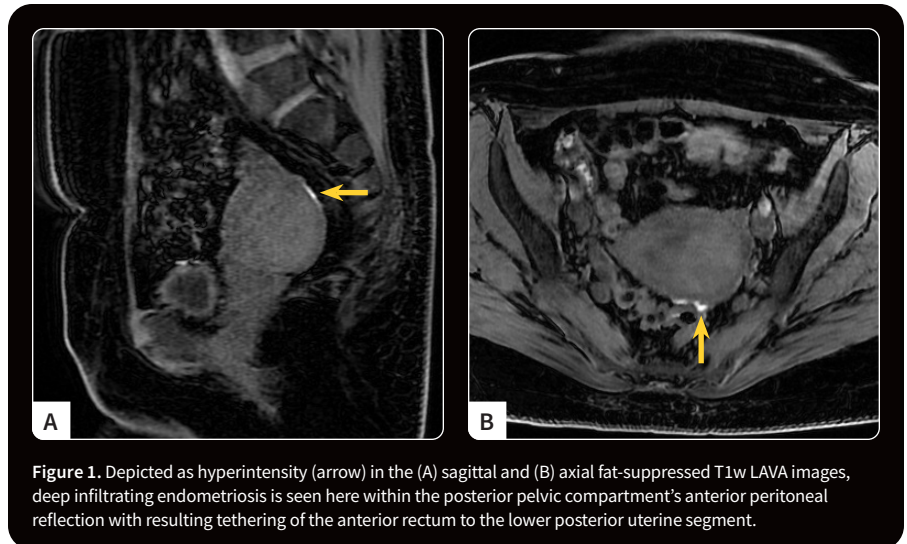
Raising awareness of MR's value in women's health

Dr. Rakow-Penner points out that many women suffering from pelvic pain do not receive adequate imaging until they come to larger academic medical centers like UC San Diego, often after years of suffering without a clear diagnosis. This delay in care highlights the need for increased awareness among healthcare providers about the value of MR in diagnosing female pelvic conditions.

By creating comprehensive educational materials and best practice guidelines, this collaboration seeks to empower radiologists in community hospitals and smaller practices to utilize advanced MR technology in diagnosing women's pelvic health issues. "We need to minimize the variability between patients and how we collect the data by standardizing protocols that will then be more streamlined for AI approaches," says Dr. Rakow-Penner.

A vision for the future

Dr. Rakow-Penner has ambitious goals for the future of women's imaging. Her vision is to develop an MR protocol that can comprehensively assess multiple causes of female pelvic pain in under 30 minutes. This would allow for a faster, more accurate diagnosis, helping alleviate the suffering



of countless women who endure years of misdiagnosis or delayed treatment.

"We're pushing the technology to overcome the challenges of sub-millimeter resolution with very good SNR, while also aiming for high temporal resolution in dynamic contrast-enhanced acquisitions," says Dr. Rakow-Penner. These technological advancements will not only benefit patients suffering from endometriosis but also those with other pelvic conditions such as uterine fibroids, ovarian masses, adenomyosis and pelvic venous disorders.

This work marks an important step forward in improving the diagnosis and treatment of women's pelvic health conditions. By developing advanced MR protocols, utilizing cutting-edge AI

technologies and providing educational resources, this collaboration aims to bridge the gap between diagnostic imaging and women's healthcare. This initiative holds the potential to transform how pelvic diseases are diagnosed, offering new hope for women who have long struggled with delayed diagnoses and insufficient care. **S**