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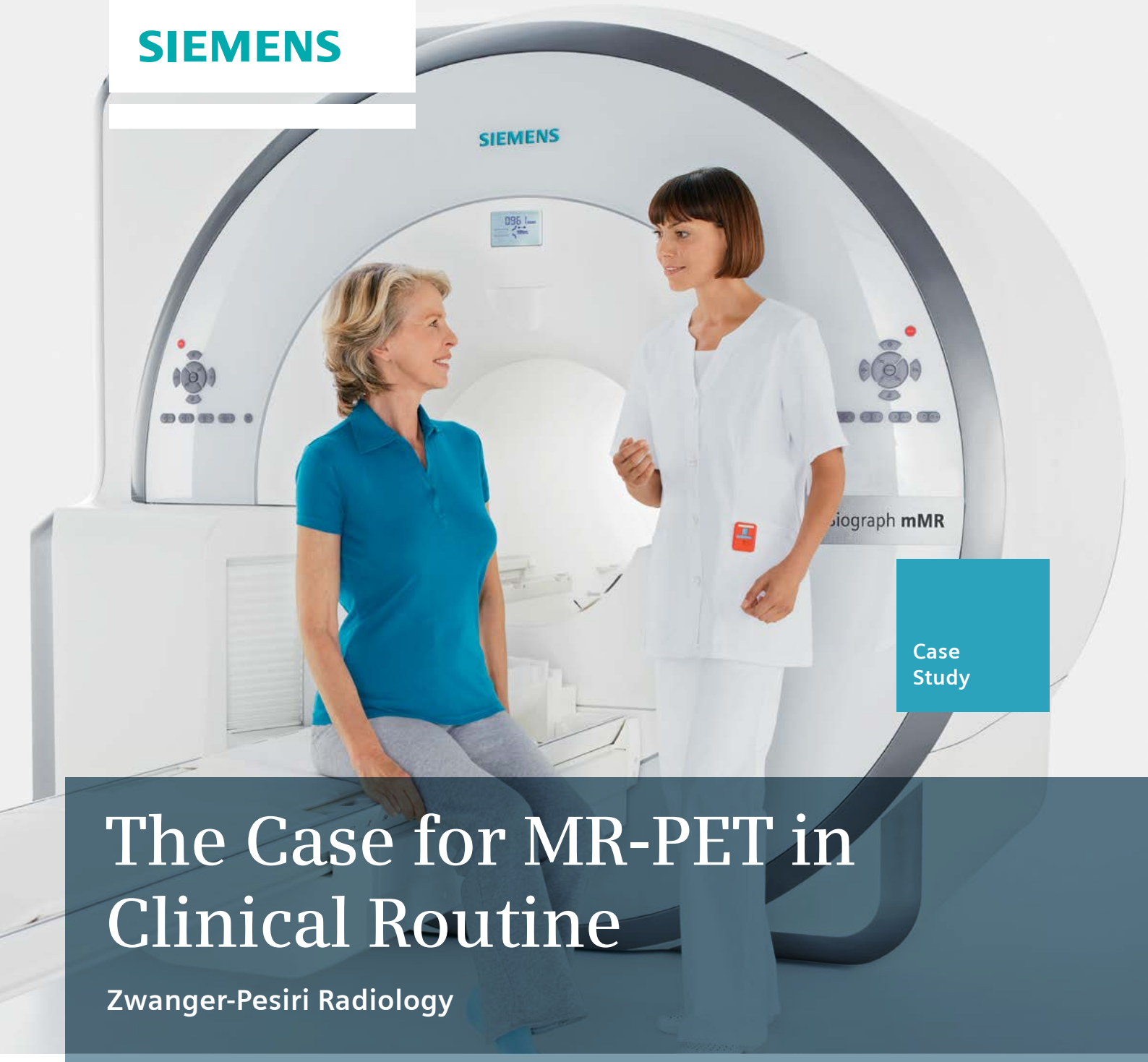

Case Study

The Case for MR-PET in Clinical Routine

Zwanger-Pesiri Radiology

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The Case for MR-PET in Clinical Routine

"In radiology, the biggest miss you can make doesn't come from misinterpreting the findings. It comes from not making the finding in the first place. Simultaneous PET and MRI has given us the ability to see more, enabling us to find disease not previously seen."

— Gwen Harris, MD
Diagnostic Radiologist
formerly with Zwanger-Pesiri Radiology

“I don’t want to be at the cutting edge. I want to be ahead of the cutting edge.”

— Steven L. Mendelsohn, MD
Chief Executive Officer
Zwanger-Pesiri Radiology

For Zwanger-Pesiri Radiology, long considered one of the most progressive and successful radiology practices in the busy metropolitan area of Long Island, NY, leadership is a fundamental aspect of its reputation. And now, as its website states, Zwanger-Pesiri is “at the forefront of modern radiology technology once again with the first and only outpatient MR-PET scanner in the United States.”

The MR-PET scanner that Zwanger-Pesiri uses is the Biograph® mMR from Siemens Healthineers. Chief Executive Officer Steven L. Mendelsohn, MD, notes a key reason: “I don’t want to be at the cutting edge. I want to be ahead of the cutting edge.”

Yet, in this age of declining reimbursement, why would a clinical practice invest in such an expensive piece of imaging equipment? The following two scenarios, both of which took place at Zwanger-Pesiri, dramatically demonstrate the reason.

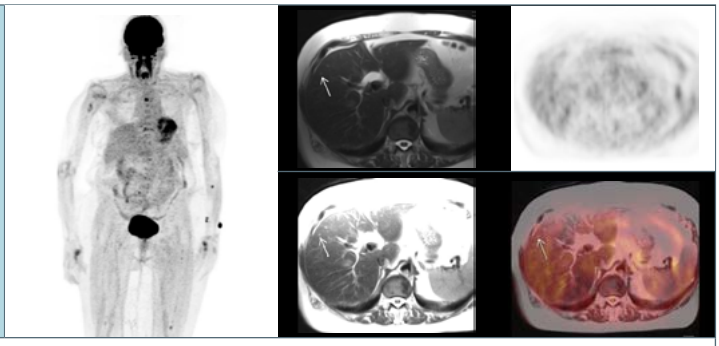
A highly precise, comprehensive picture in only one scan

With its precise alignment of MR and PET images through simultaneous acquisition, Biograph mMR provides one frame of reference for assessment and diagnosis, minimal motion artifacts, and exact spatial registration for virtually seamless spatial alignment. Our industry-exclusive Tim® 4G integrated coil technology is optimized for Biograph mMR, and the materials used in the mMR Tim coils and the mMR Tim table minimize attenuation of the PET signals

Simultaneous scanning also delivers significant productivity advantages. For clinical radiology centers like Zwanger-Pesiri, the ability to obtain PET data and diagnostic MRI data in a single scan streamlines acquisition, supports faster diagnoses, and enables results to be sent to referring physicians more quickly. For patients, the benefits include reduced radiation exposure, shortened exam time, and less strain and effort expended on multiple appointments.

Case Study 1

MR-PET scan reveals small liver metastases not seen on prior PET-CT scans



Patient History

A female patient with stage IV metastatic breast cancer was referred for an MR-PET scan due to rising markers. She was undergoing chemotherapy for known osseous metastasis and prior PET/CT scans revealed a stable disease. Liver function tests were also normal.

Findings

The MRI component of the MR-PET scan revealed four sub-centimeter metastatic lesions in the right hepatic lobe which, due to their small size, could not be identified on the PET images.

Analysis

Dr. Gwen Harris analyzes this case:

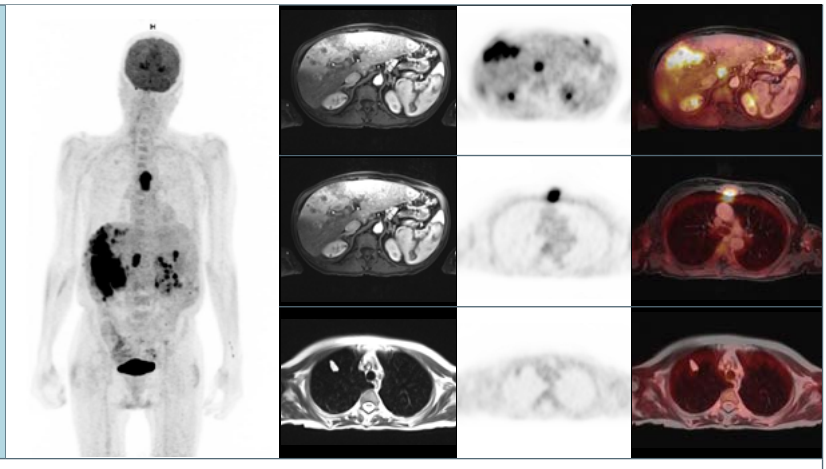
The patient originally underwent several PET/CT scans due to her increased markers thought to be from the bone metastases. Since liver function tests were within normal limits and prior PET/CT scans revealed stability in her osseous metastases, there would likely have been no change in her care management. However, because the MR-PET scan revealed tiny liver metastases, which caused her rising markers, the patient's treatment was significantly altered.

Dr. Harris believes it was the additional soft tissue characterization provided by the MRI scan that made the difference. "For a patient like this," she says, "who has something subtle like small liver metastases, there would have been no way of knowing what was being missed without the MR-PET scan."

Dr. Mourtzikos is a firm believer in PET-CT, but she is also aware of its limitations. "Everybody agrees on the importance of PET-CT in oncologic imaging. But no one is reading the CT diagnostically and saying, 'I'm hanging my hat on that answer.' What we're finding with MR-PET is that not only are we increasing our specificity, but our sensitivity is exceptionally high. That's exactly what you want in cancer imaging."

Dr. Jesse Stoff, a clinical immunologist who refers to Zwanger-Pesiri, views the difference this way: "MRI delivers much better tissue definition than CT alone and differentiates tissue density around the mass itself. That allows me to see how the immune system attacks. You gain more information with clearer pictures, and you're using far less radiation."

Case Study 2
MR-PET scan identifies second primary hepatocellular carcinoma in lung cancer patient



Patient History

A 67-year-old female patient with a lung nodule with sternal involvement was referred for an MR-PET scan for staging. A biopsy of the lung lesion revealed lung cancer; a biopsy of the sternal lesion revealed a lung cancer metastasis.

Findings

The MRI component of the MR-PET scan revealed four sub-centimeter metastatic lesions in the right hepatic lobe which, due to their small size, could not be identified on the PET images.

Analysis

Dr. Karen Mourtzikos, director of Molecular Imaging at Zwanger-Pesiri Radiology, analyzes this case:

"Traditionally, a PET/CT scan would have been ordered in this particular case. In fact, after all findings were confirmed, the patient's physician stated that had he received only the PET-CT results, he would have determined the liver findings to be a lung metastasis. He would have not biopsied the liver, and the patient would have been treated for lung cancer only. However, the additional HCC findings led to a drastic change in this patient's care."

"What's happening now is there are people doing fellowships today who are learning how to use MR-PET. When they enter the 'real world,' they're going to demand it. We'll be ready for them, which means we'll be the ones attracting tomorrow's best talent, too."

— Anthony Pavone
Executive Vice President of
Clinical Imaging
Zwanger-Pesiri Radiology

The imperative to decrease radiation

For Robert Day, Zwanger-Pesiri's chief operating officer and chief technical officer, MR-PET offers yet another critical benefit. "In radiology, we know we're producing ionizing radiation. Our goal is to limit it as much as possible and still produce an accurate image."

Dr. Mendelsohn backs up that approach with numbers. "If you're doing a full-body CT scan on a patient, you're injecting twice as much isotope with a PET-CT than with an MR-PET. That difference could be the equivalent of about 250 chest X-rays."

The reduced radiation of MR-PET makes it invaluable for pediatric oncologists. "We get truly enthusiastic referrals from pediatric oncology groups," notes Dr. Harris.

"After all, if you're going to image teenagers over and over for a curable lymphoma, wouldn't you prefer to minimize their radiation exposure as much as possible?"

Richard Solazzo, MD, a specialist in integrative and complementary cancer care, is emphatic about the benefits of MR-PET: "I have some patients who need PET scans every three months. That could be 500 chest X-rays or more. If you figure they get about half the radiation from MR-PET, you could potentially save them the equivalent of about 250 chest X-rays. That's a huge difference."

Zwanger-Pesiri physicians use MR-PET imaging to diagnose and treat the following conditions:

- Alzheimer's Disease
- Brain Tumor
- Breast Cancer
- Cervical Cancer
- Colon Cancer
- Dementia
- Esophageal
- Head & Neck
- Liver Cancer
- Lung Cancer
- Lymphoma
- Melanoma
- Myeloma
- Ovarian Cancer
- Pancreatic Cancer
- Prostate Cancer
- Renal
- Sarcoma
- Testicular
- Thyroid
- Uterine Cancer

"MR-PET will become the standard of care. It might be three, five, or ten years from now. But it will become the standard of care."

— Robert Day
Chief Operating Officer
and Chief Technical Officer
Zwanger-Pesiri Radiology

A true consideration for the patient

As a private practice, Zwanger-Pesiri is intensely invested in throughput. In fact, across its 21 locations, Zwanger-Pesiri performs between 600 and 700 MRI exams a day on 20 scanners. Yet, there's little question that MR-PET is a time-intensive technology. As Dr. Harris puts it, "It's a benefit that MR-PET gives us more data to make a diagnosis than PET-CT, but it can be time-consuming to interpret so much information."

How long does it take the radiologists at Zwanger-Pesiri to do an MR-PET scan? Dr. Mourtzikos is proud to answer. "We get good answers at 45 minutes. That's a complete scan," she says. "Our PET-CT scans, for an average patient, take about 25 to 35 minutes, and they have to keep their arms up. However, when we tell patients that their combined MR-PET scan will be 45 minutes, and they can keep their arms down, they're fine with it. Plus, no oral contrast has to be given."

Dr. Harris notes that simultaneous MR-PET may also help improve a cancer patient's quality of life. "It's hard to be sick. It's hard to make all of the necessary appointments," she says. "Every time there's an equivocal finding on a PET-CT that requires an MRI, the patient has to make another appointment, take off another day from work, and then be scanned again. It's much better patient care to do all the needed imaging in one visit."

The power of leadership

For Dr. Mendelsohn, there is much to be gained from Zwanger-Pesiri's unique position as a clinical practice that offers MR-PET. "Having an MR-PET capability absolutely gives us added credibility," he notes. "People know about our leadership in the field today, and it's all part of our reputation."

Day agrees. "Strictly from a marketing standpoint, MR-PET isn't just helping us, it's frankly hurting our top competition. They can't say they're ahead of us. They can't even say they've caught up to us. Our radio advertising tells the whole New York metropolitan area that we are the first outpatient center in the country to offer MR-PET. It's one more way we show we are ahead of cutting edge."

Executive Vice President of Clinical Imaging Anthony Pavone points out that in addition to the diagnostic, productivity, leadership, and patient benefits the Biograph mMR delivers, there is another significant reason Zwanger-Pesiri decided to bring MR-PET into the clinical space. "What's happening now," he states, "is there are people doing fellowships today who are learning how to use MR-PET. When they enter the 'real world,' they're going to demand it. We'll be ready for them, which means we'll be the ones attracting tomorrow's best talent, too."

Day puts it most succinctly. "MR-PET will become the standard of care. It might be three, five, or ten years from now. But it will become the standard of care."

The outcomes achieved by the Siemens customer described herein were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, and level of IT adoption), there can be no guarantee that others will achieve the same results.

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