Bridging the Gap between the MR Suite and the Emergency Room

Elmar M. Merkle, MD

Title: From the ER to the MR Suite at a Major Academic Hospital: A Body Imager's Perspective

Over the past fifteen years, the radiologic community has seen a steady rise in the number of cross sectional imaging studies requested by emergency room physicians. This holds true for a wide variety of patients ranging from the pediatric age group to geriatric patients and from stroke to motor vehicle accidents, and blunt and penetrating trauma. While patients with neurologic diseases sometimes end up in the MR suite as a first line imaging modality, patients with abdominal or pelvic diseases follow quite a different imaging route. These patients are usually examined first using ultrasound and/or computed tomography, and it is not unheard of that these patients even see an imaging suite first before being examined by an emergency room physician.

Why is that? In a perfect world, an emergency physician would be available as soon as a patient shows up at the emergency room door. Following a thorough 'history and physical', the emergency physician would access the patient's medical record including all the prior imaging information, and finally, after consulting with the radiologist, the ER physician would select the most appropriate imaging modality. Unfortunately, we are not living in this perfect world, and the scenario outlined above does not exist anywhere on this planet (if I am wrong, please let me know and I will try to schedule my next ER visit appropriately). In the real world, the emergency room is a very expensive 'real estate' in every hospital, and is amongst the most common 'bottlenecks' in terms of patient flow. Decisions need to be made quickly, and sometimes the very best imaging strategy may not be the most appropriate one. In addition, there appears to be a disconnect between the MR community and the 'real world'. While the MR community rightfully claims that computed tomography comes with a hefty price in terms of radiation exposure, the deficits of magnetic resonance imaging are oftentimes neglected. These are: availability, robustness, length of examination, and MR safety. CT is available 24/7, and is incredibly robust with non diagnostic examinations occurring in less than 1% of cases. CT can easily be performed within a 15 minute time window meaning in room time! Finally, there are no implants which are not CT safe. MR imaging on the other hand oftentimes is not available 24/7, and if so, sometimes an MR technologist needs to be called in first. However, this 24/7 availability is a key requirement to bridge this gap! In addition, abdominal and pelvic

MR imaging is not as robust as CT in uncooperative patients with the potential of delaying the patient's care. Finally, MR still takes too long to be a real competitor, but here the gap is certainly getting closer.

This lecture will discuss the status quo of CT and MR in the setting of emergency body imaging, and will highlight what it takes for MR to be a true alternative to CT for patients referred to the ER for abdominal and pelvic problems.