Imaging In Orthopaedic Surgery

By Thomas J. Haverbush, M.D.
Orthopaedic Surgeon

Transforming patient information into patient understanding.

Imaging studies are essential in the evaluation and treatment of Orthopaedic Surgery conditions and injuries. All the modalities that we have available provide their own unique valuable information.

Many times it has been said in these articles that a thorough history and careful examination must be done first and that provides a working diagnosis. Sadly, too often this aspect of good patient care is considered less important by other doctors. This working diagnosis will then lead to the selection of the proper imaging modality.

O.K. So what are these modalities as they are called?

Radiography (Plain X-rays)

X-rays are obtained by projecting x-ray beams through a subject onto an image detector or x-ray film. When the beam goes through tissues radiation is absorbed, which decreases the amount of radiation projected onto the x-ray film. Where the radiation was decreased a bright or white image appears on the x-ray film. Plain x-rays have been extremely valuable in Orthopaedic Surgery diagnosis for generations.

Standard and sometimes specialized views are taken of the affected areas and evaluated by the Orthopaedic Surgeon and Radiologist. Lead shields are used whenever possible to protect from unnecessary radiation exposure especially in areas of radiation sensitive tissue and in children.

Computed Tomography

Known commonly as CAT Scan or CT. (I wonder if dogs ever get jealous. Hmm) The CT images look completely different from plain x-rays because you have to think in 3D in order to interpret them.

CT is very helpful when further detail is needed to evaluate complex fractures.

Soft tissue evaluation can be enhanced by using IV contrast dye to evaluate masses and tumors.

Drawback: it subjects patients to increased radiation exposure.

MRI (Magnetic Resonance Imaging)

Hold up your hand if you knew what the 3 letters stood for. I thought so.

It is used for evaluation of:

- soft tissue
- the spine
- tumors
- bone infection
- stress fractures

Because the images are produced using a powerful magnetic field, MRI’s cannot be done on a patient who has certain kinds of metal implanted in their body.

Other drawbacks are patients who are claustrophobic or are too large to fit in the machine. Open MRI scanners are needed for these patients. MRI studies come at a very high cost generally.

Bone Scan
A bone scan detects the distribution of a radioactive isotope that is injected intravenously. The isotope is detected by a special camera that produces images that appear very different from other studies. Bone Scans are used to detect:

- Infections
- Tumors
- Spread of tumor (metastases)
- Certain metabolic diseases

P.E.T. scans are another unusual type of imaging study which we infrequently use in Orthopaedic Surgery and is beyond the scope of this article.

**Ultrasound**

Ultrasound is used in evaluation of the musculoskeletal system because of its safety and relative low cost. Basically when sound waves bounce off certain structures, echoes are produced. Different tissues have their own echo pattern. A hand held device called a transducer converts the echoes into images.

It is technically hard to perform and interpret.

Orthopaedic Surgeons use ultrasound to detect joint swelling and fluid collections, tendon and ligament damage, soft tissue masses and infant hip dysplasia.

Well, we are at the end of our short course on Imaging in Orthopaedic Surgery. Hope you learned something and have a good week.

*My patients put their trust in me and what I do improves the quality of their lives.*

**Office Website and Gratiot County Herald Archive**

Thank you loyal readers for joining us each week. Do yourself a favor and log onto [www.orthopodsurgeon.com](http://www.orthopodsurgeon.com).

It contains a world of musculoskeletal information you and your family and friends can use!

Website, Your Orthopaedic Connection, Archive of all previous GCH articles.

Please check it out. Be well.

Good health, good life, all the best to you.

315 Warwick Drive
Alma, Michigan 48801
Phone 989-463-6092 for an appointment

Dr. Haverbush