
RSNA Press Release

Image-guided Bone Biopsy: Faster, Easier, Safer

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OAK BROOK, Ill.--As many as nine out of ten patients who have a bone tumor may now be able to get an exact tissue diagnosis without having to undergo open surgical biopsy, suggests a study published in the June issue of the journal *Radiology*. The alternative outlined in the study is a percutaneous (through-the-skin) needle biopsy closely guided by an imaging procedure, either computed tomography or fluoroscopy.

"The single most outstanding attribute of this method," said lead author James S. Jelinek, M.D., of the Washington Cancer Institute at the Washington Hospital Center in Washington, D.C., "is that a patient can have a biopsy the same day he or she sees the orthopedic oncologist about a tumor."

Today's imaging-monitored percutaneous techniques have drastically reduced the need for surgical biopsy to sample tumors in the chest, abdomen and pelvis, as well as some soft tissue masses. While the technique has been shown to be a sensitive and specific approach, orthopedic surgeons have been slow to accept the needle method out of concern that it will not yield enough tumor tissue to enable an accurate diagnosis. With malignant tumors, it is crucial to get enough tissue to be certain exactly what type of tumor is present, so that treatment - whether surgery, radiotherapy and/or chemotherapy - may begin as soon as possible. "Before you can treat, you need a tissue diagnosis," Dr. Jelinek asserted. "We worked closely with an orthopedic oncologist on all biopsies."

The study showed that percutaneous biopsy, in most cases guided by CT, was performed on 110 patients with primary bone tumors and provided a conclusively correct tissue diagnosis 88 percent of the time, which is comparable to an open surgery biopsy result. The most important question - whether a given tumor is benign or malignant - was answered correctly in all but two instances, for an impressive 98 percent rate of accuracy. It is important to note that initial biopsy in open surgery on these two cases also did not yield a correct diagnosis.

As with surgical biopsy, the risk of error reflects the experience of both the physician doing the procedure and the pathologist who interprets the findings. Fewer than 10 percent of patients required surgical biopsy because of uncertain needle biopsy findings. Complications were limited to a single small blood clot at the biopsy site; no blood vessels or nerves were

injured.

An open biopsy is surgery in every sense, including the need for planning and advanced scheduling. The patient receives a general anesthetic, and an incision is made that takes about 10 days to heal and leaves a two- to five-inch scar. No tumor treatment is recommended for two weeks.

In contrast, needle biopsy can be done immediately in the outpatient department. If indicated, treatment may begin the following day. The surgical incision is replaced by a small needle hole. Instead of general anesthesia, the patient is given a combination of intravenous sedation and local anesthetic to numb the biopsy site. The procedure itself takes less than an hour to remove an average of five tissue samples, and the anesthesia wears off within two hours. X-ray exposure is not excessive.

Among the advantages of percutaneous bone biopsy, compared to the traditional surgical method:

- Specimens may be taken from different parts of a tumor, not just the exposed portion.
- A cytopathologist can determine immediately if enough tissue has been taken; if not, the biopsy can continue.
- It is much less invasive, allowing the treatment team to proceed almost immediately with tumor chemotherapy, radiation or surgery if needed.
- It is at least three times more cost effective.
- Complications are far less frequent.

With a skilled bone radiologist, pathologist and orthopedic surgeon working together, Dr. Jelinek believes that "today there is very little reason for an open surgical biopsy of a musculoskeletal tumor." The findings indicate that percutaneous image-guided bone biopsy is a highly accurate and patient-friendly alternative.

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"Image-guided Primary Bone Tumor Biopsies: Experience with 110 Primary Tumors." Collaborating with Dr. Jelinek on this study were Mark D. Murphey, M.D., James A. Welker, D.O., Robert M. Henshaw, M.D., Mark J. Kransdorf, M.D., Barry Shmookler, M.D., and Martin M. Malawer, M.D.