Title
MUSCULOSKELETAL INFECTION OF THE EXTREMITIES - EVALUATION WITH MR IMAGING - REPLY

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usually visualized as a wedge-shaped configuration, and its attenuation is usu-
ially higher than that of true space-occupy-
ing lesions. Therefore, uneven opacifica-
tion of liver parenchyma would be cor-
rectly diagnosed after much experi-
ence with AP-CT.

In any case, I think that the readers of
Radiology may find it difficult to under-
stand the low sensitivity of AP-CT be-
cause the contrast between the lesions
and liver parenchyma is most definite on
AP-CT scans compared with that seen on
DS-CT and EOE-CT scans, as shown in
Figures 3 and 4. I hope that Miller et al
reevaluate their data after clarifying their
diagnostic criteria and performing AP-CT
in many more cases.

References
Hepatic metastasis detection: comparison
of three CT contrast enhancement meth-
Liver metastases from colorectal cancers:
detection with CT during arterial por-

Dr Miller responds:

I thank Dr Matsui for his letter. He has
extensive experience in evaluation of the
liver for metastatic disease and has clearly
read our article (1) carefully. He raises
some interesting points.

1. The criteria used for interpreting all
three studies were the same. We looked
for focal areas of decreased attenuation.
Obvious nonmalignant lesions were not
counted. Equivocal lesions were consid-
ered positive; if subsequently shown to
be benign histologically, they were con-
sidered false positive. In Figure 3, the
cyst was not identified as a false-positive
lesion on DS-CT or EOE-CT scans because
it was not detected among the background
of low-attenuation vessels. The area of
fibrosis was considered a false-positive
lesion on EOE-CT scans. Because of the
nature of the study, radiologists inter-
preting individual scans did not have access
to results of any other imaging studies. As
Dr Matsui notes, correlation with other
imaging studies is usually extremely
helpful and may allow exclusion of some
false-positive lesions.

2. Just as Dr Matsui has extensive ex-
perience in the use of AP-CT, we have ex-
tensive experience in the use of EOE-CT
and DS-CT. We have in fact demonstrated
that the sensitivity of DS-CT and EOE-CT
decreases for lesions under 1.5 cm in di-
ameter (1-3), but in this study opacifi-
cation of the hepatic vasculature during
AP-CT did not increase sensitivity or de-
crease the false-positive rate compared
with those achieved with DS-CT or EOE-
CT.

3. I agree that uneven opacification is a
major problem with AP-CT. It is notewor-
thy that this does not occur with DS-CT
or EOE-CT. While flow-related defects are
usually wedge-shaped, they need not al-
ways have this configuration, as shown in
our Figure 5. Obviously, extensive experi-
ence with AP-CT is helpful, but some les-
ions will always be a problem. Inciden-
tially, we were quite careful not to wedge
the tip of the angiographic catheter or di-
rect it into a side branch of the superior
mesenteric artery.

Dr Matsui concludes that the reader
might find it difficult to understand the
low sensitivity of AP-CT because lesion-
Xiver contrast is very high as shown in
our Figures 3 and 4. I would stress that
these figures show false-positive lesions
and not tumor. This was proved histolog-
ically, and I think Dr Matsui’s comment
reiterates our point that AP-CT has an un-
acceptably high false-positive rate. It is
for this reason, and not because of their
sensitivity, that we prefer DS-CT and
EOE-CT for the evaluation of hepatic me-
tastases.

Musculoskeletal Infection of the Extremities: Evaluation with MR Imaging

From: James A. Scott, MD
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Editor:
We were puzzled by several of the con-
clusions drawn by Tang et al (1) in their
article in the January 1988 issue of Radiol-
ogy, which described magnetic resonance
(MR) imaging findings in musculoskele-
tal infection of the extremities. As the au-
thors noted in their Results section, the
experiment lacked several design features
necessary to evaluate sensitivity and
specificity meaningfully. It is therefore
surprising to see the conclusion drawn
that “MR imaging had high sensitivity
and specificity in the detection of active
infection in bone, even in cases of chronic
osteomyelitis with or without previous
surgery or fracture.” The article provided
no information from which this conclu-
sion can be drawn. No statistically mean-
ful conclusions can be drawn from the
data presented because of the described
limitations in experimental design (2).

The authors stated that both T1- and
T2-weighted images are necessary to eval-
uate musculoskeletal infection because of
the nonspecific appearance on T1-weight-
ed images. Thus, the three patients stud-
ied with only one pulse sequence should
presumably have been excluded from
consideration, since it is unclear how a diag-
nosis for these patients was reached on
the basis of MR imaging data. In cases in
which surgical proof was lacking, correla-
tion with clinical course and other avail-
able imaging studies was used as “proof”
(method not described). Despite the fact
that the authors repeatedly referred to
the limitations of these procedures. The
abstract indicated that “MR images pro-
vided more accurate and detailed infor-
mation regarding the extent of involve-
ment than did radionuclide bone scans,
computed tomographic scans, or standard
graphs.” No information about pathologi-
pathological proved extent of disease
was provided. Clearly, the method being
studied cannot be presented as its own
proof.

While these results are interesting, they
do not support modification of currently
accepted protocols for the evaluation of
osteomyelitis.

References
1. Tang JSH, Gold RH, Basset LW, Seeger LL.
Musculoskeletal infection of the extremi-
ties: evaluation with MR imaging. Radiol-
ogy 1988; 166:205-209.
2. Scott JA, Phillips WC, Blaszczyinski GM.
Statistics for diagnostic procedures. AJR
1983; 141:409-411.
management of osteomyelitis. Because MR imaging is relatively nonspecific, we have always emphasized the need to interpret its findings in the light of those of other imaging modalities, especially plain radiography.

From: John S. Tang, MD Richard H. Gold, MD Lawrence W. Bassett, MD Leanne L. Seeger, MD Department of Radiological Sciences University of California Los Angeles School of Medicine Los Angeles, CA 90024

Transthoracic Needle Aspiration Biopsy: Evaluation of the Blood Patch Technique

From: Edgar L. Surprenant, MD Department of Radiology Pacific Hospital 2776 Pacific Avenue Long Beach, CA 90806

Editor:

In their article in the January 1988 issue of Radiology, Bourgouin et al (1) reported their incidence of pneumothorax after transthoracic needle aspiration biopsy performed with a coaxial system. They reported that pneumothorax occurred in 28.8% of the patients (15 of 52) in whom the blood patch technique had been used (group A) and in 34.1% (30 of 88) of those who underwent biopsy without this technique (group B). Chest tube insertion was required in 7.7% of the first group and 9.1% of the second. The authors concluded that, in their series, the blood patch technique failed to affect the frequency of postbiopsy pneumothorax.

Our first 55 biopsies performed with the blood patch technique in 50 patients were reviewed. Pneumothorax occurred in only three of the procedures (5.5%), and chest tube insertion was not needed in any of the cases. No patient experienced significant hemoptysis or any other complication.

Our technique is similar to that used by Bourgouin et al. A preliminary chest radiograph was obtained. A coaxial needle system with a 19-gauge introducer needle and a 22-gauge aspiration cannula was used for all biopsies. The patients were not sedated before the biopsy. After installation of a local anesthetic, the 19-gauge needle was directed toward the target during quiet breathing. The pleura was punctured only once. Upon completion of the biopsy, 5–10 mL of autologous clotted blood was injected through the introducing needle as it was withdrawn.

Our technique varied as follows. The patients were usually supine or prone, but occasionally an oblique or decubitus position was employed, either for patient comfort or for better access to the lesion. All biopsies were performed under computed tomographic guidance (not fluoroscopy). The 19-gauge needle was advanced to or into the periphery of the lesion (not 1 cm from it). Aspiration was performed through the 22-gauge needle with a 20-

Dr Shepard and McLeod respond:

We commend Dr Surprenant for his low complication rates, including a pneumothorax rate of 5.5% (three of 55) and a chest tube insertion rate of 0% (zero of 55). However, we dispute his advocacy of the blood patch technique for the prevention of pneumothorax based on his series of 55 biopsies.

Dr Surprenant states that his was “an older population in which a significant incidence of emphysema would be anticipated.” However, he did not specifically determine the prevalence of emphysema or indicate the depth of the lesions that were sampled in his patient population. We contend that our series comprised a large number of high-risk patients. Radiographic evidence of emphysema was present in 19.6% (nine of 46) in group A and in 21.7% (18 of 83) in group B.

Furthermore, Dr Surprenant’s series did not include a control group. Without a control group he cannot correctly attribute the lower complication rate to the blood patch technique. Our series included a control group in which both the prevalence of emphysema and depth of the lesions were similar. Because Dr Surprenant’s series did not include a control group and because the risk factors in his patients were not stated, we believe that his advocacy of the blood patch technique is unsound.

We do have reason to believe that Dr Surprenant’s postbiopsy care may have contributed in part to his better results. Dr Surprenant kept his patients in the horizontal position for 1 hour after the biopsy. In our series the patients underwent erect chest radiography within 10–15 minutes of the biopsy. Asymptomatic patients were allowed to remain upright in bed or to walk.

Recently, we too have adopted a similar postbiopsy routine. Our patients now remain supine or prone for 30–45 minutes after the biopsy, pending a rapid cytologic interpretation. After an upright posterior-anterior chest radiograph is obtained, they remain in the horizontal position for an additional hour. In a review of our last 242 cases managed in this manner, we have found that although our pneumothorax rate has remained the same, 31.8% (77 of 242), the chest tube insertion rate has declined to 2.5% (six of 242). (Approximately 75% of the biopsies entailed a single pass with a 22-gauge aspiration cannula or the use of a coaxial technique.)

In comparing Dr Surprenant’s technique with our own reported series, the only significant difference that is readily apparent is the method of postbiopsy care. Keeping patients horizontal for at least an hour after the biopsy appears to contribute to a lower incidence of pneumothorax for which chest tube insertion is needed.

Reference


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