EDITORIAL

Capromab Pendetide Imaging of Occult Lymph Node Metastases

Capromab pendetide (ProstaScint®, Cytogen Corporation, Princeton, NJ), an ^{111}In-labeled murine monoclonal antibody immunoconjugate reactive with prostate specific membrane antigen (PSMA), recently received Food and Drug Administration (FDA) approval for detection of soft-tissue metastases in patients with prostate cancer who are at high risk for metastatic disease. In the setting of newly diagnosed, biopsy proven prostate cancer, ProstaScint® imaging should be reserved for those patients with a high likelihood of metastatic disease based on Gleason score, prostate specific antigen (PSA) level and clinical stage. A positive scan confirming the pretest probability of metastatic disease may direct the patient toward systemic treatment options or directed biopsy for histopathologic confirmation whereas a negative scan would encourage a pelvic lymph node dissection and, if appropriate, definitive local therapy (radical prostatectomy or radiation therapy).

In my experience, ProstaScint® imaging is more commonly requested in the postprostatectomy patient with an elevated PSA who is considering salvage radiation therapy (RT). The article by Hinkle et al. (*1*) in this issue of the *JNM* nicely illustrates the ability of ProstaScint® to identify occult lymph node metastases in this clinical setting. As the authors point out, approximately 50%–75% of patients who elect salvage RT fail to achieve a durable PSA response, probably because many had occult metastatic disease outside the RT field at the time of treatment. In patients with metastatic disease identified by ProstaScint® imaging, the cost and morbidity of futile RT may be avoided.

In a retrospective study by Kahn et al. (*2*), 65% (23 of 36) of patients with ProstaScint® scans negative for metastatic disease achieved a durable PSA response after salvage RT versus 25% (2 of 8) of patients with scans positive for metastatic disease outside the RT field. The two responders with positive scans had elevated serum PSMA levels and may have non-PSA producing metastases. A larger prospective study is planned to confirm these findings.

Although there are other published reports (*3*) of pathologically confirmed ProstaScint®-positive retroperitoneal lymph node metastases, the sensitivity and specificity of ProstaScint® for detection of extrapelvic lymph node metastases is not well defined since most patients with scans positive for retroperitoneal or mesenteric lymph node metastases do not undergo surgical exploration (or autopsy). The reported sensitivity and specificity for pelvic lymph node metastases based on a study of primary disease patients before pelvic lymph node dissection are 62% and 72%, respectively (*4*). I would expect the sensitivity and specificity for detection of abdominal lymph node metastases to be significantly higher. It has been my experience that the intensity of uptake in ProstaScint® positive abdominal lymph nodes is significantly greater than in pelvic lymph nodes. The former are usually obvious on planar imaging whereas the latter are usually identified only by SPECT. It should also be pointed out that the pre-pelvic lymph node dissection study was completed before optimal imaging parameters were established. For example, blood-pool imaging, currently routinely obtained to minimize false-positive results due to vascular asymmetry, was not required. Imaging beyond 48 hr postinjection was also not required whereas we now realize that imaging is optimal between 72 and 120 hr. Imaging too soon after injection is likely to increase the false-negative rate since substantial residual blood-pool activity may obscure uptake in positive lymph nodes immediately adjacent to blood vessels.

ProstaScint® imaging is technically demanding and scan interpretation is challenging, particularly SPECT imaging of the pelvis for detection of iliac lymph node metastases. For this reason, the FDA approved ProstaScint® for use "only by physicians who have had specific training in the interpretation of" ProstaScint® images (*4*). To address this concern and to minimize interpretation errors as experience with this new agent is developed, Cytogen Corporation, the manufacturer of ProstaScint®, has established a Partners in Excellence (PIE℠) program. Cytogen has arranged for a nuclear medicine technologist trained in ProstaScint® image acquisition and processing to be present during a physician's first few scans to help train his or her own technologists. To help with image interpretation, the first ten scans are sent to a nuclear medicine physician experienced in the use of ProstaScint® who provides prompt feedback regarding the technical quality of the study and the scan interpretation. Once ten cases have been successfully completed, the site is inspected and, where appropriate, accredited to perform ProstaScint® imaging by the American College of Nuclear Physicians.

There is presumptive evidence that training and experience with ProstaScint® results in improved performance. To date, the agreement between the on-site scan interpretation and the experienced reviewer's opinion, on average, has improved from 70% on the first and second scans to 86% on the ninth and tenth. It is also noteworthy in the prepelvic lymph node dissection study that the sensitivity and specificity for detection of pelvic lymph node metastases was significantly higher at sites performing ten or more scans (65% and 78%, respectively) versus sites performing less than ten (58% and 62%).

ProstaScint® imaging provides a new means of staging patients with prostate cancer. When performed by trained nuclear medicine professionals skilled in its use, it has the potential to improve patient management.

Michael K. Haseman
Sutter Community Hospitals
Sacramento, California

Received Jun. 26, 1997; accepted Jun. 27, 1997.

For correspondence or reprints contact: Michael K. Haseman, MD, Department of Nuclear Medicine, Sutter General Hospital, 2801 L St., Sacramento, CA 95816.

Note: Dr. Haseman is also a consultant to the Cytogen Corporation.

REFERENCES

1. Hinkle GH, Burgers JK, Olsen JO, et al. Prostate cancer abdominal metastases detected with indium-111 capromab pendetide. *J Nucl Med* 1998;39:650–652.
2. Kahn D, Haseman MK, Libertino J, et al. Indium-111 capromab pendetide (ProstaScint®) imaging of patients with rising PSA post-prostatectomy [Abstract]. *J Urol* 1997;157:204.
3. Burgers JK, Hinkle GH, Haseman MK. Monoclonal antibody imaging of recurrent and metastatic prostate cancer. *Semin Urol* 1995;13:103–112.
4. ProstaScint® Kit (capromab pendetide), Kit for preparation of indium 111 capromab pendetide for intravenous use only. Package insert.