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Subject: Radioactive Sentinel Node Biopsy

Over the last several years, enhanced sentinel node localization, extraction, and, biopsy has been made possible by the use of a radioactive tracer, ^{99m}Tc sulfur colloid. Up to 1 milliCurie (in 4, 250 microCurie syringes) is injected in the local area of the breast tumor and tracks through the lymph system to the sentinel node(s). The surgeon identifies the pathway of drainage as he utilizes a very sensitive radiation probe (Neoprobe, Care Wise, etc.) and the radioactivity aids in localization, identification, and extraction. The quantity of radioactivity present in the specimens (tumor, lymph systems, and nodes) is extremely small (nodes typically contain 1-15uCi), since a majority of the sulfur colloid remains in the tissue surrounding the tumor.

When this method was first tried at the Medical Center several years ago (1995-1998), I was present at each of the cases where radioisotopes were used. Each time, I evaluated radioactive contamination, surgical area dose rates, and radioactivity present in the tissue samples. I followed the samples to Pathology where they were prepared, mounted, and examined. I evaluated the cutting surfaces, the sinks, and the handling devices for contamination and was unable to find ^{99m}Tc present on these surfaces. As a result of these evaluations, and the extremely insignificant amount of activity present in the tissue samples, it was decided that no special precautions were necessary for either the surgeons or the pathologists.

Following our early experience with this modality, these methods became more commonplace throughout the country. Cautiously conservative Medical Health Physicists were recommending that sentinel node biopsy samples "sit for 72 hours" prior to anyone handling them. These recommendations were not based on risk to the handlers, but more upon the premise that if these samples were no longer radioactive, that they could be treated normally.

Our experience has been, and continues to be that these samples are "de minimus" or contain activity at concentrations that are not worth considering since they are so insignificant. Any contamination present from these samples is of no consequence, since as a matter of surgical and pathological technique, gloves are always worn when handling these samples or body fluids. In addition, ^{99m}Tc has only a 6 hour half-life; within 24 hours only about 6% of the initial activity is present. Therefore, any "hazard" it poses is a rapidly diminishing one.

Based on these evaluations and reasoning, there are no special procedures necessary for these particular samples. As the need arises in the future for evaluation of other radiopharmaceuticals used in surgery, I will perform the same safety analyses prior to their full implementation.

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