

## Comparison of extraarticular leakage values of radiopharmaceuticals used for radionuclide synovectomy

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**Objectives:** Radionuclide synovectomy is a reliable therapy in patients with chronic synovitis. However, radiation doses delivered to non-target organ systems due to leakage of radioactive material from the articular cavity are an important disadvantage of this procedure. In this study we compared extraarticular leakage values of the 3 commonly used radiopharmaceuticals;  $^{90}\text{Y}$ -citrate,  $^{90}\text{Y}$ -silicate and  $^{186}\text{Re}$ -sulfide colloid. **Materials and Methods:** Thirty-five patients with persistent synovitis were enrolled in the study. Twenty-two hemophilic, 8 rheumatoid arthritis and 5 patients with pigmented villonodular synovitis were studied.  $^{90}\text{Y}$  labeled silicate and citrate were used for knee joints and  $^{186}\text{Re}$ -sulfide for intermediate sized joints. Radiocolloid leakage values were evaluated using a gamma camera with 20% window centered over the bremsstrahlung photopeak of  $^{90}\text{Y}$  and a respective window over the 137 keV photopeak of  $^{186}\text{Re}$ . Regions of interest were drawn over the injection site, the regional lymph nodes and the background areas. Leakage of radiocolloid was calculated by dividing the counts/pixel in the regional lymph node area to the counts/pixel in the injection site. **Results:** No visible leakage was observed. The median leakage values calculated for  $^{90}\text{Y}$ -citrate,  $^{90}\text{Y}$ -silicate and  $^{186}\text{Re}$ -sulfide were found as 1.9%, 2.4% and 2.7%, respectively. The difference between the variability of leakage values was not statistically significant ( $p > 0.05$ ). **Conclusion:** There was no significant difference in terms of extraarticular leakage between  $^{90}\text{Y}$ -citrate,  $^{90}\text{Y}$ -silicate and  $^{186}\text{Re}$ -sulfide radiocolloids.

**Key words:**  $^{90}\text{Y}$ -citrate,  $^{90}\text{Y}$ -silicate,  $^{186}\text{Re}$ -sulfide, chronic synovitis, radionuclide synovectomy