

# RADIOSYNOVIORTHESIS: RADIOISOTOPE THERAPY FOR ARTHRITIC CONDITIONS

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## **Introduction**

Radiosynoviorthesis (Radiosynovectomy, RSO) is an established treatment for arthritis having been successfully used for over 60 years. It involves an intra-articular injection of small radioactive particles to treat the inflamed synovia. Commonly used isotopes include Y-90, Re-186, Er-169 and P-32 (for hemophilic arthropathy). A new isotope, Sn-117m, is now being evaluated to treat small joints in human and veterinary conditions. Recent data also suggests that larger joints can be treated with this isotope.

## **Discussion**

In Europe, frequent indications for RSO are rheumatoid and poly-arthritis. In Germany RSO is the second most common therapy in nuclear medicine with over 50,000 treated joints per year. In Spain, USA, Turkey, Argentina and the Philippines the therapy has focused more on treating hemophilic arthritis with excellent results. This application is particularly important in developing countries where the availability and affordability of clotting factors make this a cost effective therapeutic option for repeated bleedings. The special focus in these countries is maintenance of mobility and work ability.

In many countries only the knee and medium joints (ankle, elbow and shoulder) are treated using Y-90, Re-186 or P-32. However, in rheumatoid arthritis the most common affected joints are the fingers. For the treatment of these small joints, Er-169 is necessary but, unfortunately, Er-169 is only available in Europe. A new isotope, Sn-117m, is being developed to treat small joints. This product has a similar dose profile to Er-169 and has demonstrated exceedingly high retention in the joint (no systemic distribution). In animal studies dogs are showing robust results well beyond a year after treatment with this product.

The response rates in rheumatoid and poly-arthritis range from 60% to 80%. Hemophilic arthritis with response rate of >90% and a significant reduction of bleeding frequency are reported. Further indications for RSO are osteoarthritis and the articular effusion after joint replacement. In general, the therapy is well-tolerated with a low rate of side effects. Because of the specific uptake of particles into the synovia and the short range of beta radiation, the radiation exposure outside the joint is low.

## **Conclusions**

RSO has advantages in comparison to surgical synovectomy: it's a low cost minor intervention and simultaneous treatments of multiple joints or repeat treatments are possible. The use of multiple isotopes to treat different sizes of joints adds cost and complexity to this procedure. A new isotope (Sn-117m) product being evaluated could allow for the treatment of all joints thereby improving the logistics and demand for this very successful procedure.

**Keywords:** radiosynoviorthesis, arthritis, colloids, therapy, radiosynovectomy, Sn-117m