

AbstractID: 7288 Title: Delineation of synovial tissue in MR images of the knee for feasibility in patient specific dosimetry planning of radionuclide synovectomy.

Purpose: Delineation of synovial tissue in MR images of the knee for feasibility in patient specific dosimetry planning of radionuclide synovectomy.

Method and Materials: A semi automated method based on marker controlled watershed was developed to delineate the synovial tissue in MR images of the knee. Markers were calculated using gray reconstruction algorithm. Segmented regions were extracted interactively by using a graphical user interface. Images used for testing were T1-weighted spin echo (TR 800, TE 20), post contrast enhanced, acquired using 1.5 Tesla MR Units (Siemens, Magnetron) and polarized knee coil. Image slices were of 0.625mm x0.625mm in size and 3mm in thickness. Only one patient's data was used. Various performance metrics were determined for evaluating the method.

Results: Results obtained from the semi automated method were compared with the manual results. Maximum overlap ratio of 86.3 % was achieved between the manually delineated and semi automatically delineated synovial tissue regions. Mean percentage error of 19% in the surface area of synovial tissue was recorded.

Conclusion: This study indicates that developed method has more robustness and reproducibility as compared to the manual method. For future work this method can be applied to other patients data, pre contrast enhanced images for volume calculation of the synovial tissue and also to individualize radionuclide synovectomy treatments.