

## Broadening the Approach to Osteoarthritis: Low Dose Radiotherapy in the Management of Post-Total-Knee-Arthroplasty Aseptic Synovitis

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**Abstract**

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### Abstract

**Purpose:** Low dose radiotherapy (LDRT) for osteoarthritis has a long history and established efficacy, despite only recently seeing a renaissance of its use in the United States. Most publications emphasize its use as a means of avoiding or delaying total joint arthroplasty. Though it has been used anecdotally in patients who encounter persistent symptoms after total joint arthroplasty, to our knowledge, no published work has described treatment with LDRT in the post-total knee arthroplasty (TKA) subpopulation. Our group developed a rationale for its use in patients who are status-post TKA, following the published DEGRO guidelines and technique. Herein we present a modest-size case series of our patients.

**Methods:** Patients included in this retrospective analysis have been under the care of the surgeon performing the TKA for months prior to considering LDRT. Patients who developed persistent and recurrent effusions were aspirated and evaluated to ensure the disease process was not infectious, rather aseptic synovitis. Prior to use of LDRT, the radiation oncologist explained the rationale for LDRT and the alternative of genicular artery embolization, comparatively more invasive. LDRT patients completed the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) to assess pain, stiffness, and functional debility. Patients were treated with the DEGRO regimen of 50 cGy administered via AP/PA radiotherapy portals every other day for six treatments, totaling 300 cGy. Fluid collections were contoured as part of the radiotherapy treatment planning process, as well as the hardware and adjacent bone, to ensure appropriate targeting. Treatment planning included heterogeneity corrections and either 6 or 10 megavolt photons. A field-in-field technique was used to minimize dose heterogeneity created by the presence of surgical hardware. Patients were informed in advance that a second course could be considered 3 months after the first. Administrations of WOMAC were repeated on or shortly after the last fraction of the initial radiotherapy course and again approximately 90 days post-treatment.

**Results:** In general, patients experienced improvement in their symptoms during the standard two week treatment course. This was subjectively observed by patients during physician visits, and borne out in the average change in WOMAC scores. In an attempt to offer the greatest volume of data, we will present analyses of our patient group as observed approximately near the time of this presentation. We will review the specifics of changes in each domain, including pain, stiffness, and functional debility, as well as offer insights into patient experiences broadly.

**Conclusion:** While retrospective, this is the first evaluation specifically addressing the use of LDRT in patients status-post TKA with aseptic synovitis. We will review numerical data afforded by an analyses of WOMAC assessments, which yield substantially greater detail than analyses by visual-analog scale scoring and other methods previously used.