Total Hip Arthroplasty after Stem Cell Transplant and CAR-T Cell Therapy

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INTRODUCTION:

Stem cell transplants and CAR-T cell therapy are performed for multiple types of cancers. The prolonged high-dose steroids required in addition to other treatments put the patient at risk for avascular necrosis, particularly of the femoral head. In many cases, total hip arthroplasty is the only treatment option that can provide long-term pain relief and improvements in function. Even after transplant, patients can have a poor immune system and have other complications including graft versus host disease. The aim of this study is to evaluate the survival of total hip replacements in patients who have undergone a stem cell transplant or treatment with CAR-T cell therapy.

METHODS:

A retrospective review of all patients who underwent a total hip arthroplasty after stem cell transplant or CAR-T cell therapy from January 1992 through October 2023 was performed. The following data was collected from all patients: age at the time of transplant and hip replacement, sex, American Society of Anesthesiology (ASA) score, body mass index (BMI), steroid use, diagnosis, side and approach of the replacement, complications, and time to follow-up and survival of the implant or death were evaluated.

RESULTS:

Ninety-seven patients with 136 total hip replacements were identified. The average age of the patient at their first surgery was 44.88 years (range 15.07 to 75.45) and average follow-up was 9.47 years (range 4.96 months to 31.09 years). Sixty-five males and 32 females were treated. Sixty-two were performed on the right side and 74 on the left-side with 96 posterior approaches, 38 anterolateral and 1 direct anterior approach. One-hundred twenty-two hips had avascular necrosis, 9 had osteoarthritis, 4 had femoral neck fractures, and 1 had a prior infection. Seventy-one of the patients were diagnosed with graft versus host disease and 61 required post-operative steroid use. The average ASA score was 3.12 (range 2 to 4) and the average BMI was 26.6 (range 16 to 42) with the most common diagnoses including AML in 31 patients, ALL in 16, CML in 10 and multiple myeloma in 10. One complication occurred intraoperatively (0.74%) with a fracture of the greater trochanter. Eight hips required a second surgery (5.88%) at an average of 6.92 years after surgery (range 1.84 months to 20.14 years). Two revisions were performed due to infections, 6 due to aseptic loosening and 2 due to dislocations. Thirty-five patients with a total of 45 hips passed away during the follow-up period at an average of 7.78 years after surgery (range 4.96 months to 24.87 years).

DISCUSSION AND CONCLUSION:

Overall, the patient survival and complication rate for total hip arthroplasty after stem cell transplant was acceptable. Although these patients have altered immune systems and may be on chronic steroids or other medications for graft versus host disease, only 2 cases of infection occurred, with the majority of revisions secondary to aseptic loosening. Further studies are required to determine the functional outcome of this patient population.