Radial Shaft Reconstruction with Intercalary Endoprosthesis

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Background: With improvements in imaging and treatment of musculoskeletal tumors, options for reconstruction following joint-sparing diaphyseal resection include the use of autografts, allografts, distraction osteogenesis, custom implants, and segmental intercalary endoprostheses.

Purpose: The objective of this case series is to demonstrate that reconstruction of malignant tumors of the radial shaft with intercalary prosthesis may provide an option for patients with segmental bone loss.

Methods: Three consecutive patients who underwent wide resection of the radial diaphysis followed by reconstruction with a custom intercalary prosthesis between January 2010 and January 2015 were retrospectively identified. A custom intercalary prosthesis with lap joint design was used in all 3 cases. Post-operatively, range of motion, weight bearing status, and MSTS functional outcome scores were reviewed.

Results: The mean follow-up was 18 months (range, 9-25). All patients were weight bearing as tolerated at 1 week post-operatively. At most recent follow-up, patients elbow flexion and extension was at a mean arc of 137 degrees (range, 130-140), mean supination of 60 degrees (range, 30-90) and mean pronation of 70 degrees (range, 60-90) at forearm, mean palmar flexion of 80 degrees (range, 70-90) and mean dorsiflexion of 80 degrees (range, 70-90) at wrist. One patient suffered a minimally displaced periprosthetic fracture after a fall, which healed uneventfully, and resulted in reduced supination. All patients reported minimal to no pain without significant functional limitations, with mean MSTS scores of 26 (87%). At latest follow-up, no return trips to the OR were needed and no patients had infection.

Conclusion: Reconstruction with intercalary prosthesis for patients with metastatic disease to radial shaft is a viable option. All patients had satisfactory results and early return to function; none required return trips to the OR. Possible advantages compared to reconstruction with bone graft or PMMA osteosynthesis include early return to function and minimal weight bearing restrictions post-operatively.

Keywords : Intercalary Prosthesis, Forearm, Radius, Segmental Defect
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