

ISOLS 2015 (Within 750 words)

## **Soft Tissue Reconstruction with Polypropylene Mesh Improves Joint Stability and Postoperative Function after Tumor Endoprosthesis**

Tomohiro Fujiwara<sup>1,2</sup>, Toshiyuki Kunisada<sup>1,3</sup>, Ken Takeda<sup>1,4</sup>, Toshifumi Ozaki<sup>1</sup>

1. Department of Orthopaedic Surgery, Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences
2. Center for Innovative Clinical Medicine, Okayama University Hospital
3. Department of Medical Materials for Musculoskeletal Reconstruction, Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences
4. Department of Intelligent Orthopaedic System Development, Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences

### **Introduction:**

Limb salvage procedures for musculoskeletal tumors near a joint often necessitate an extended soft-tissue resection. Excision of tumors including surrounding muscles leads to joint dislocation and postoperative functional insufficiency. Since 1993, we have used polypropylene mesh and nonabsorbable polyester thread for capsular and soft tissue reconstruction after tumor endoprosthetic replacement.

### **Questions/Purposes:**

In this study, we investigated the functional outcomes and postoperative complications of the patients who underwent limb salvage procedures with endoprosthetic replacement and capsular reconstruction with polypropylene mesh.

### **Methods:**

We reviewed 33 patients with primary malignant bone and soft tissue tumors in/around the proximal femur (n=14), proximal tibia (n=10) and proximal humerus (n=9), who were treated with limb salvage between 1993 and 2013. The polypropylene mesh was tightened around the prosthesis by Ethibond and all the muscles around the joint were anatomically fixed to the mesh-prosthesis complex. Capsular reconstruction was performed in the proximal femur and proximal humerus, with the polypropylene mesh sutured to the remaining articular capsule before wrapping endoprosthesis. The mean

follow-up period was 5.2 years (1.2–15.4 years). Functional results were assessed at final follow-up visits using the Musculoskeletal Tumor Society (MSTS) System.

**Results:**

Proximal femur: The postoperative mean MSTS score was 79% (70–93%) with the mean flexion was 92° (80–120°). Twelve (86%) patients walked without any support. Although there was one late infection, which healed after debridement and local irrigation, no patient experienced hip dislocation or the other complications. Proximal tibia: The mean MSTS score was 76% (50–100%) with the mean flexion was 90° (45–115°). Their active leg extension showed favorable results with one patient who showed extension lag at 5°. There were no other complications except for delayed wound healing in 3 (30%). Proximal humerus: The mean MSTS score was 77% (70–83%) with the mean flexion was 20° (10–45°). There was one subluxation but no patient experienced dislocation or postoperative infection.

**Discussion and Conclusion:**

The capsular and soft tissue reconstruction on the basis of polypropylene mesh can reduce the postoperative joint instability and provide better function than the reconstruction without synthetic mesh that had been previously reported. Using polypropylene mesh should be considered for patients with tumor resection and endoprosthetic replacement.

**Summary:**

The capsular and soft tissue reconstruction with polypropylene mesh can reduce the postoperative joint instability and provide better function than the reconstruction without synthetic mesh.