

OsteoBridge™ IDSF

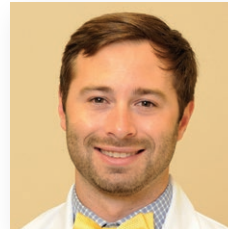
Intramedullary Diaphyseal Segmental Defect Fixation



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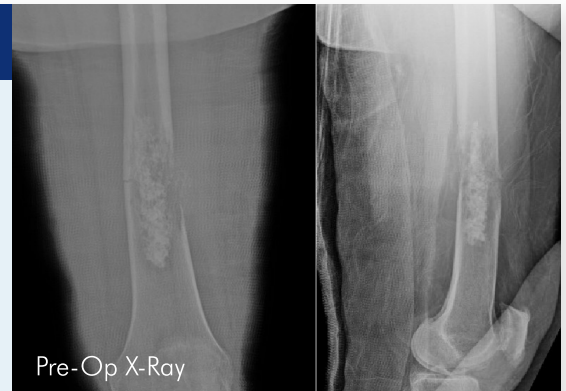
Case Information

Age: 70

Sex: Female

Diagnosis: Chondrosarcoma

Bone: Femur



Patient History

A 70-year-old female had a nondisplaced distal femoral diaphyseal pathologic fracture from biopsy confirmed high-grade dedifferentiated chondrosarcoma (T2N0M0G3, Stage IIB). Recommended urgent wide resection and placement of some form of reconstruction or replacement of excised femur. Determined patient was excellent candidate for a **Merete® OsteoBridge™ Intramedullary Segmental Defect Fixation (IDSF) system**, due to their age, mobilization status, fracture pattern, location of lesion, and possibility of post-operative chemotherapy +/- radiation. However, we determined that due to the metaphyseal extension of pathologic fracture a porous Link® TrabecuLink distal femoral cone would supplement distal fixation due to the distal intramedullary canal measuring roughly 6cm in length.

Management

Under general anesthesia in lateral decubitus position fluoroscopy was used to mark out the tumor and a standard posterolateral approach to the femur was utilized. After performing osteotomies roughly 2cm proximal and distal to the visible tumor involvement (with assistance of pre-operative MRI) the tumor was excised en-bloc with the vastus intermedius and portions of the biceps femoris (measured 11.5cm in length). Surrounding margins were negative intraoperatively. As previously planned, to accommodate the 72mm stem length (on the 90mm implant), the distal segment was lengthened roughly 1cm by placing a 30mm diaphyseal Link® TrabecuLink cone into the distal femur. This was trialed and sat flush with the 14 x 90mm distal stem. Proximal femur was reamed to 12mm and cemented a 140mm stem. Then the distal stem was cemented. After the cement cured, two distal interlocking screws were placed through the distal stem for further fixation. After subtracting the 1cm augment from the removed mass length we planned for a reconstruction with two 5cm diaphyseal segments and an interconnector. These were provisionally tightened, and rotation matched using linea aspera and transepicondylar axis, then final tightened. Patient was made weight bearing as tolerated, but avoid deep flexion, squatting, and twisting activities per preference of surgeon.

Outcome of management and follow-up

Patient discharged from the hospital on post-operative day 3 after walking 25ft with walker to a skilled nursing facility. Was seen at her 4-week post-operative visit doing well and progressing with physical therapy with her continued extremes of motion restrictions. Pathology confirmed negative margins from her surgery and did not require post-operative radiation. Knee range of motion was 0-45° without pain.

Why this patient was a candidate for Merete® OsteoBridge™ IDSF

Other possible options for this patient's presentation include lateral plate or intramedullary nail fixation with auto/allograft reconstruction, distraction osteogenesis, distal femur replacement, or some form of intercalary spacer. Of the listed options, fixation with allograft reconstruction is the most common with good survivorship,¹ but they have a high complication rate and added risk of host rejection.^{2,3,4,5} Vascularized autograft was not an option due to the size of the defect. One of our goals was to preserve the patient's native knee, so distal femur replacement was not a reasonable option as well. Since early mobilization was of utmost importance, distraction osteogenesis was not a reasonable option. Intercalary endoprostheses allow for early mobilization and eliminate several allograft complications.¹ This is imperative in this patient population to decrease morbidity and mortality, allowing for post-operative chemotherapy and local radiation early in their course without causing unnecessary harm to the construct. Historically, intercalary endoprostheses had to be custom-made and posed several difficulties during implantation which are similar to the modular first generation intercalary endoprostheses; these include: Neuropraxia via intraoperative distraction to implant the construct because each intercalary junction is assembled with the nail before they are connected, Lack of independent rotation relative to the proximal and distal nails to connect the ends, and Shorter nails in the remaining intramedullary canal causing increased risk of aseptic loosening.⁶ **Merete® OsteoBridge™ IDSF Fixation System** is a viable modular intercalary endoprosthesis that allows intraoperative implant and rotational adjustments while nails are cemented or locked in the intramedullary canal.⁷ Further this system provides the option to use variable nail diameters and more fitted to the anatomic curvature of various long bones. Therefore, the **Merete® OsteoBridge™ IDSF Fixation System** provided a successful outcome for this patient with the added benefit of early weight bearing and allowing post-operative chemotherapy +/- radiation without complication, despite the patient not requiring it.

1 Ahlmann ER, Menendez LR. Intercalary endoprosthetic reconstruction for diaphyseal bone tumors. *J Bone Joint Surg (Br)* 2006;88-B:1487-91.

2 Brunet O, Anract P, Bouabid S, Babinet A, Dumaine V, Tomeno B, Biau D. Intercalary defects reconstruction of the femur and tibia after primary malignant bone tumour resection. A series of 13 cases. *Orthopaedics & Traumatology: Surgery & Research* 2011; 97:512-9

3 Cara JA, Lacleriga A, Canadell J. Intercalary bone allografts. Twenty-three tumour cases followed for 3 years. *Acta Orthop Scandi* 1994;65:42-6

4 Donati D, Di Liddo M, Zavatta M, Manfrini M, Bacci G, Picci P, et al. Massive bone allograft reconstruction in high-grade osteosarcoma. *Clin Orthop Relat Res* 2000;377:186-94

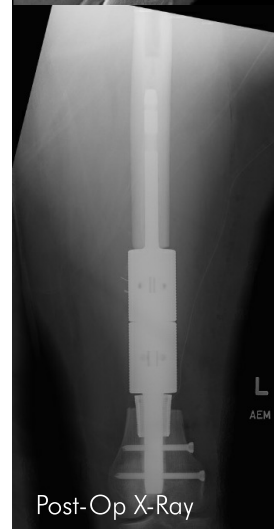
5 Hornicek FJ, Gebhardt MC, Tomford WW, Sorger JI, Zavatta M, Menzner JP, et al. Factors affecting non-union of the allograft-host junction. *Clin Orthop Relat Res* 2001;382:87-98.

6 Benevenia J. OsteoBridge™ Merete® Limb Salvage Systems Intramedullary Diaphyseal Segmental Defect Fixation Clinical Brochure. 2020. <https://mereteusa.com/details/osteobridge-idsf-clinical-brochure/>

7 Benevenia J. OsteoBridge™ Merete® Limb Salvage Systems Intramedullary Diaphyseal Segmental Defect Fixation Clinical Brochure. 2020. <https://mereteusa.com/details/osteobridge-idsf-clinical-brochure/>



Magnetic Resonance Imaging with contrast (pre-fracture) indicative of the 6cm intramedullary canal intact distal to the lesion



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