

REPIPHYSIS® Expandable Technology Distal Femur for Skeletally-Immature Children: 6 Year Case History

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Figure 1



Figure 2



PATIENT PROFILE

In 1996, a six-year-old female was diagnosed with Osteosarcoma of the left distal femur (**Figure 1**). Preoperative imaging of the femur indicates tumor extends into the epiphysis. She was treated with induction chemotherapy followed by wide resection and reconstruction with a modular rotating hinge prosthesis (**Figure 2**). After two years, she developed a fatigue fracture of the tibial hinge stem. The revision surgery was completed with a new tibial hinge stem as well as a midsection interchangeable component, with which the patient was lengthened 2cm. At the time of surgery, she was noted to have loosening of the tibial component, which was revised as well (**Figures 3 and 4**).

At age ten, she had developed a limb length discrepancy of 2cm and was projected to grow an additional 7.5cm. This 9.5cm discrepancy would have required a total of 5 midsection exchange surgeries to maintain limb length equality. In order to eliminate four surgeries, it was elected to convert her current modular prosthesis to a REPIPHYSIS® Distal Femoral Implant. The REPIPHYSIS® Distal Femoral Implant was custom designed to attach to the well-fixed femoral stem, with an expansion capacity of 10cm.

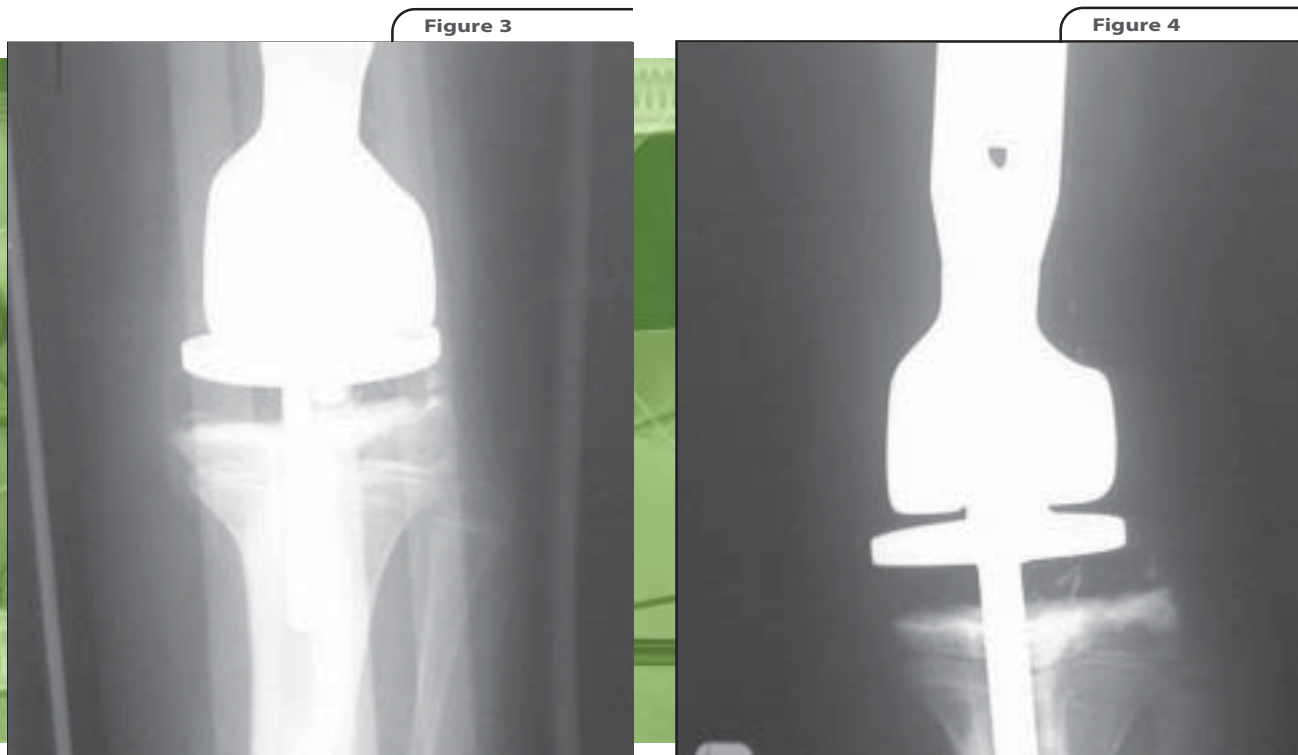
SURGICAL METHOD

The components of the modular rotating hinge prosthesis were removed beginning with the hinge axial pin, followed by the femoral midsection and femoral articulating component. The REPIPHYSIS® Distal Femur Implant was attached to the well-fixed femoral and tibial stems. She was also lengthened 2cm at the time of surgery.

POSTOPERATIVE COURSE

In the 24 months following her conversion, she has undergone 6 expansions, which resulted in 5.75 cm of total growth (**Figures 5-10**). All expansion attempts were successful and free of complication. Her function is in the excellent range on MSTTS scores. Her leg lengths are equal and there is no radiographic evidence of loosening.

Recently, we have seen evidence of closed growth plates on the contralateral distal femur and proximal tibia and further growth is not anticipated in the future. Therefore, the patient will be converted to the GUARDIAN® Modular Oncology System in the near future.

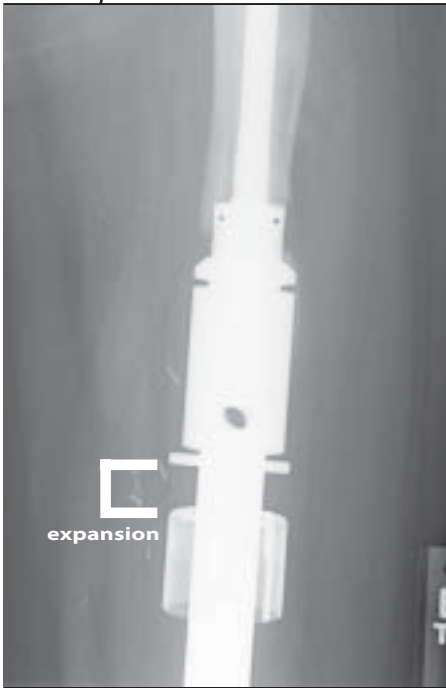


DISCUSSION

When faced with 9.5cm potential limb length discrepancy, it was an easy decision to revise the patient to a noninvasive expandable prosthesis. The patient gained a total of 7.75cm of expansion with this conversion surgery and subsequent expansions. If we had continued with the modular prosthesis, she would have undergone three additional surgeries within 24 months.

The REPIPHYSIS® Noninvasive Expandable Prosthesis has provided a stable reconstruction while maintaining limb length equality without additional expansion surgeries.

Figure 5



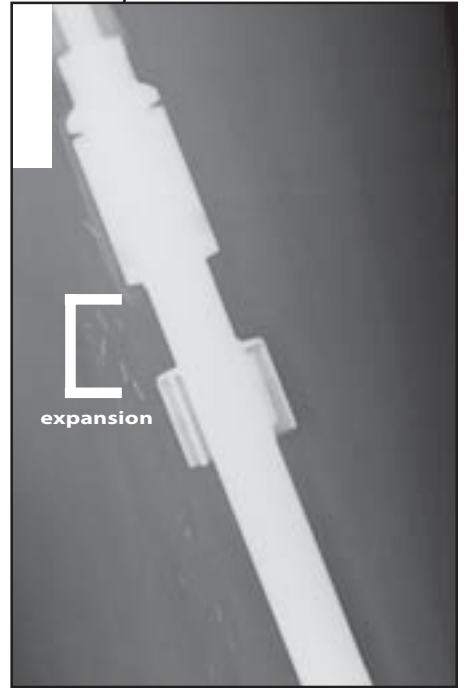
June 19, 2001

Figure 6



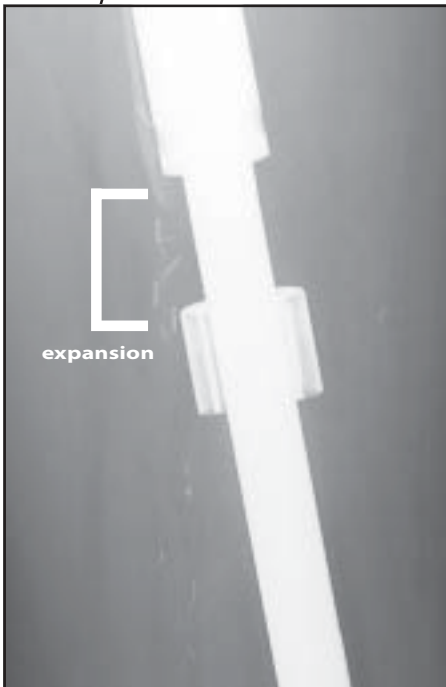
September 27, 2001

Figure 7



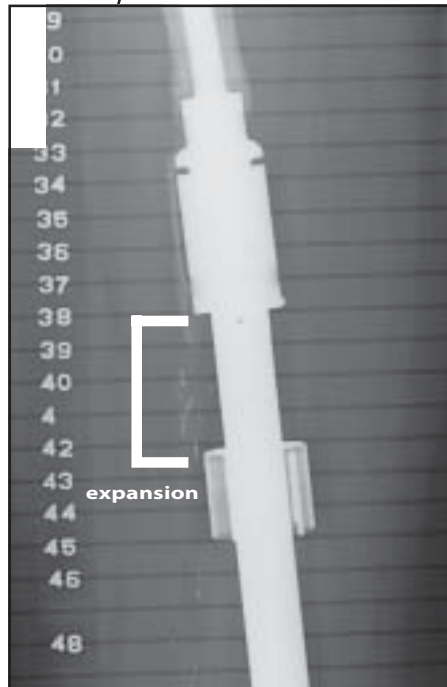
January 9, 2002

Figure 8



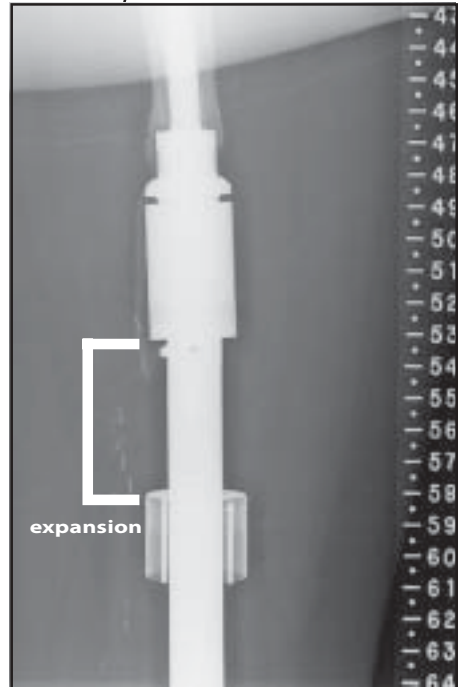
May 7, 2002

Figure 9



August 27, 2002

Figure 10



January 6, 2003



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