

## **Pathological Fractures (Biphosphonate) of the Femur—Presentation, Diagnosis and Treatment of Non Unions**

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Bisphosphonates have indeed been shown to cause atypical femoral shaft fractures in the subtrochanteric zone of a femur as well as at the tip or femoral stems in periprosthetic fractures.

Both fractures show similar pathology with relatively transverse fractures that require excellent fixation and good constructs that can withstand delayed healing. It can take up to 5 months for an atypical femoral shaft fracture and up to 8 months for a periprosthetic femoral fracture.

The fixation construct for an atypical shaft fracture is a cephalomedullary nail with two locked distal screws. This allows excellent relative stability and permits early callous formation while protecting the whole femur against the potential for a femoral neck fracture.

If a femoral nonunion occurs, which can happen in over 15 % of these fracture , a plan has to exist as to how this should be approached.

In the initial nonunion, most would recommend an exchange femoral nail with an extra 2 mm of reaming and a larger nail locked proximally and distally. Most would not graft at this time but a planned open autogenous graft if minimal healing is seen by 3 to 6 months would be recommended.

If a second nonunion occurred, DCP compression plating with an open autogenous iliac crest bone graft would be the consensus at this time. This should be done with a long plate construct and the compression devise should be utilized to achieve very aggressive compression at the nonunion site. Early weight bearing would be allowed in most cases.

Periprosthetic atypical femoral fractures can also exist and if a nonunion occurs in this instance (usually after 8 to 9 months) then compression plating and bone grafting as described above would be the anticipated treatment. These constructs should be long and should allow early weight bearing.

In conclusion

Bisphosphonates can cause harm and should be used wisely and for 2 to 3 years and then re-evaluated.

Make sure your construct will survive an extra long period of healing and will permit early weight bearing.

Aggressive compression at the fracture site should be the plan in nonunions