

Abstract

Healing of severe fractures using a synthetic graft combined with drugs

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When a critical defect occurs and the fracture fails to heal an extensive treatment method is required. The Masquelet technique is a promising approach to treat these kinds of fractures. In the Masquelet technique a membrane is induced and is thereafter filled with a graft. Today, autograft is normally used, however the usage is not without complications. A better option would be a synthetic graft and the challenge is then to enable a sufficient natural bone ingrowth. The osteoinductive BMP in combination with the anticatabolic drug bisphosphonate zoledronate are predicted to improve the new bone formation. At Lund University a study was investigating if these drugs combined with a scaffold could improve the fracture healing. This was tested on fractured rat femurs that have been given different treatments in four separate groups A) BMP, B) Scaffold, C) BMP+Scaffold D) BMP+Scaffold+Bisphosphonate Zoledronate. As a part of the study, this project used microCT to study the fracture healing. The images were then analyzed in MatLab. The results indicated that the combination in group D was the most beneficial alternative to enhance new bone formation. This combination used with the Masquelet technique is a promising treatment option for critical defects.

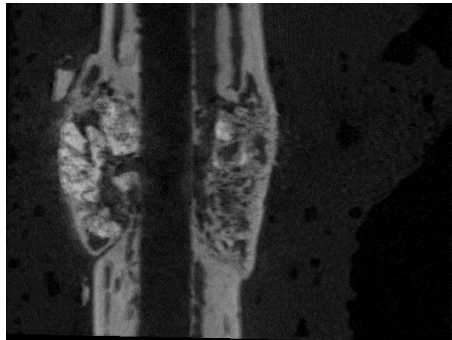


Figure 1: MicroCT scan of fractured bone. New bone has been formed within the critical defect. A callus can be seen around the fracture