• SINGLE APPLICATION OF EXTRACORPOREAL SHOCK WAVES IN 97 PATIENTS WITH NONUNIONS OR DELAYED HEALING FRACTURES

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This prospective clinical study was designed to test the effect of shock waves on patients with fracture healing problems.

Extracorporeal shock waves are successfully used for the disintegration of urinary tract concrements since more than 15 years. Experimentally applied to bone shock waves were found to be responsible for new bone formation. 97 patients (mean age 43.5 yrs.) with 97 fractures were treated by a single shock wave exposure either in general (56), regional (38) or local (3) anaesthesia. There were 63 shaft fractures in long bones, and 34 fractures in cancellous bone. In 19 patients fracture treatment was conservative, 78 patients had operative treatment. Of these 24 patients were operated upon twice, the other 24 three times or more. 20 patients had deep wound infection prior to shock wave therapy. In 32 patients the delay to the initial injury was 3 to 6 months (delayed healing), in 65 patients it was more than 6 months with a range of up to 25 yrs. (non-union). Actual follow-up time is 20 months (range 6 to 48).

For evaluation bony consolidation of the fracture/non-union on plain radiography or CT was judged. There were no complications in any form from shock wave exposure, except local swelling, haematomas or petechial bleeding without clinical impact. In 71 of the 97 patients (73.2%) bony union was achieved within 6 months. There was no significant difference in the results between delayed healing 23 (71.8%) non-unions 49 (75.4%) and infected non-unions 15 (75%). Our results suggest that shock waves have a stimulating effect on osteoformation justifying its application in delayed fracture healing or in non-unions.