

# Shock wave therapy in the treatment of non-unions and delayed unions of long bones

## Author:

Carlo De Durante, A. Pellegrino, M. Buffolano, F. Tedesco, C. Colella

## Institution:

S. G. Moscati Hospital - U.O.C. of Orthopedics and Traumatology, Via Gramsci, 81031, Aversa (CE), Italy

## Device and producing company:

Modulith SLK by Storz Medical

## Introduction:

Over the last 10 years, shock wave therapy has changed the treatment approach of many orthopaedic pathologies. In this paper the authors would like to contribute to the international literature by presenting their methodology concerning the treatment of long bones non-unions and delayed unions.

## Methods:

Ninety-seven patients affected by delayed consolidation and non-union of long bones were treated with shock waves; 58 male and 39 female, average age 42.5 (min. - 17, max. - 72); 43 femurs, 34 tibias, 13 humeri, 4 ulnas, 3 radii. The device used was Modulith SLK by Storz Medical, equipped with radiological computerized aiming system; treatment protocol consisted of three sessions performed every two days, each session consisting of 4000 pulses with energy varying from 0.60 to 0.90 mJ/mm<sup>2</sup>. The treatment, which did not need anesthesia, involved progressively increasing the energy and gently maneuvering the source to include all the tissue in the focus.

## Results:

All the patients were examined clinically and with X-rays before treatment and one and six months after treatment.

## Final results:

- Femur: 35 cases of total consolidation (83%)
- Tibia: 28 cases of total consolidation (80%)
- Humerus: 11 cases of total consolidation (84%)
- Ulna: 3 cases of total consolidation (75%)
- Radius: 3 cases of total consolidation (100%)

In 35 patients (36%) who presented partial consolidation at one month follow-up (12 femur, 14 tibia, 6 humerus, 2 ulna, 1 radius) a second treatment was performed.

## Discussion:

We believe the failures were primarily due to the following factors:

- 1) atrophic non-unions
- 2) defect of stability of the bone segment
- 3) distance (> 5 mm) between the bone fragments

## Conclusion:

The authors consider shock wave therapy the first choice in the treatment of non-unions and delayed unions of long bones; no complications were observed and percentages of success were very high.