ESWT as treatment in adult delayed & non-union fractures: Considerations about failures

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Device and producing company:
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Introduction:
1% to 3% of all fractures fail to consolidate. ESWT shows remarkable results for treating this pathology. Failure analysis should improve our success rate.

Methods:
From November 1999 to February 2006, 31 adult patients with 26 non-unions (7 scaphoids, 7 humeri, 5 femurs, 4 tibia, 1 metatarsal, 1 pubis, 1 pelvis) and 5 delayed union (2 humeri, 1 femur, 1 metatarsal, 1 tibia), diagnosed by x-rays, MRI and/or CT scan were treated (19 - Orthospec, 0.33mJ/mm2, 5000 to 12,000 pulses administered in I to 3 sessions; 12 - Compact Alpha, single session, 4000 shots, 0.5-0.7 mJ/mm2). Appropriate bone stabilization was assessed accurately pre- and post- ESWT, through individual analysis. Failures were determined when: a) clinical /radiological non-healing was present one year after treatment; b) patient opted to receive surgery during the first year of follow-up.

Results:
Success was achieved in 21 (68%) of patients (all delayed unions went into resolution), with 10 failures (32%). In cases failing ESWT and needing surgical intervention histological analysis has been performed. These indicated some information of the working mechanism of ESWT and the reasons for failures.

Discussion:
Carpal scaphoid non-unions represent 40% of the failures in this study. This study includes 24 B3 cases and 2 A3 cases (ISMST Classification), so the vascular aspect was a relevant factor in the failures. One tibia failure was considered a recalcitrant non-union (the condition having existed for more than 10 years).

Conclusion:
1. Before ESWT we must asses the vascular status of bones and their environment.
2. Carpal Scaphoid requires special consideration.
3. Long standing non-unions merit special analysis.