

Delayed union and non-union in pediatric patients treated with ESWT.

Auhtor:

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Device and producing company:

ORTHOSPEC / MEDISPEC

Introduction:

Pediatric patients with bone repair disturbances following corrective osteotomy represent a considerable burden to surgeons and significant delays to surgical schedule processes for each case. Many times these patients exhibit intrinsic bone repair damage, therefore all medical decisions concerning them require expertise.

Methods:

From January 2002 to December 2007 we treated 8 children (3 male, 5 female; average age - 12 years, age range: 4 to 16 years) after failed limb lengthening surgeries. For 5 Delayed Union cases and 3 definite Non-Unions, the main bone diagnosis was: Proximal Femoral Focal Deficiency (PFFD, 3), Pyogenic Hip Arthritis with failed femur-ischial support (2), Idiopathic Short Stature (ISS, 1), Achondroplasia (1) and Tibiae Pseudo-Arthrosis in Neurofibromatosis (NF1, 1). Seven cases received a single session of SW (Orthospec - 5000 impacts-0.33mJ/mm²-40MPa). One case (PFFD, rosary osteotomy into 5 fragments with infected non-union) was treated with three similar sessions over a period of 10 weeks. Immobilization was indicated or maintained on all cases until bone repair.

Results:

Seven cases achieved resolution (average time - 12 weeks) and one case (achondroplasia) failed, maintaining her non-union status longer than 20 weeks and requiring a massive bone graft.

Discussion:

In literature, intrinsic bone repair disturbances are described only for NF1 and Achondroplasia patients. For this last condition, SW failure occurred mainly because we intended to solve a massive lateral defect of the lengthened femur. In this case, despite several previous surgical procedures, including one infected multi-focal non-union and pseudo-arthrosis in Neurofibromatosis, we observed significant bone repair induced by shockwave treatment.

Conclusion:

SW might be the most important post-operative tool for those pediatric patients with post-surgical complications related to bone consolidation. The adequate response of tibiae pseudo-arthrosis in NF1 to shockwaves needs further studies. In this sense, a novel protein specifically associated to osteoblast during osteogenesis (Osteocrin) seems to be a good marker of normal or abnormal bone repair and has been selected as a "bone molecular target" in our experimental studies with SW.