Extracorporeal Shock Wave Treatment For Osteonecrosis Of The Femoral Head

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Purpose:
A prospective clinical study was performed to evaluate the efficacy of shock wave treatment for osteonecrosis of the femoral head.

Patients and Methods:
This study consisted of 22 patients with 29 hips in the study group and 5 patients with 5 hips in the control group. The study group included 18 males and 4 females with an average age of 43 years. The average duration of symptoms was 4.9 months and the average follow-up time was 20 months. Each hip was treated with 4000 impulses of high-energy shock waves at 28 Kv. The control group received sham treatment without shock waves. Clinical assessments included pain scores and Harris hip scores. Radiographs and magnetic resonance images (MRI) were used to evaluate the size of the lesion, congruency of the femoral head and bone marrow edema of the hip joint.

Results:
The study group showed significant improvement in pain scores ($p < 0.001$) and Harris hip scores ($p = 0.001$) after shock wave treatment, whereas the changes in the control group were statistically not significant ($p > 0.05$). The overall clinical outcomes of the study group were 76.2% improved, 19.1% unchanged and 4.7% worsened in patients with stage II lesions; and 62.5% improved, 12.5% unchanged and 25% worsened in patients with stage III lesions. All cases in the control group showed unchanged results. The complications are mild and negligible. MRI showed significant reduction in bone marrow oedema of the affected hip after shock wave treatment ($P < 0.000$) despite non-significant changes in the size of the lesion and the congruency of the femoral head.

Conclusion:
High-energy shock wave treatment appeared to be effective in pain relief and improvement of hip function for osteonecrosis of the femoral head in short-term follow-up. The results are more successful in patients with stage II than stage III lesions. Despite satisfactory early results, the results of long-term follow-up are needed to further verify the efficacy of this novel treatment.