Treatment for Osteonecrosis of the Femoral Head: Comparison of Extracorporeal Shock Waves with Core Decompression and Bone-Grafting

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There is continuing controversy regarding the optimal treatment for patients with symptomatic earlystage osteonecrosis of the femoral head. We compared the results of noninvasive treatment with extracorporeal shock waves with those of core decompression and bone-grafting in similar groups of patients.

Patients with stage-I, II, or III osteonecrosis were randomly assigned to be treated either with shock waves or with core decompression and nonvascularized fibular grafting. The shock-wave group consisted of twenty-three patients (twenty-nine hips), and the surgical group consisted of twenty-five patients (twenty-eight hips). The patients in the two groups had similar demographic characteristics, duration and stage of disease, and duration of follow-up. The patients in the shock-wave group received a single treatment with 6000 impulses of shock waves at 28 kV to the affected hip. The evaluation parameters included clinical assessment of pain with a visual analog pain scale, Harris hip scores, and an assessment of activities of daily living and work capacity. Radiographic assessment was performed with serial plain radiographs and magnetic resonance imaging.

Before treatment, the two groups had similar pain and Harris hip scores. At an average of twenty-five months after treatment, the pain and Harris hip scores in the shock-wave group were significantly improved compared with the pretreatment scores ($p < 0.001$). In this group, 79% of the hips were improved, 10% were unchanged, and 10% were worse. Of the hips treated with a nonvascularized fibular graft, 29% were improved, 36% were unchanged, and 36% were worse. In the shock-wave group, imaging studies showed regression of five of the thirteen lesions that had been designated as stage I or II before treatment and no regression of a stage-III lesion. Two stage-II and two stage-III lesions progressed. In the surgical group, four lesions regressed and fifteen (of the nineteen graded as stage I or II) progressed. The remaining nine lesions were unchanged.

Extracorporeal shock-wave treatment appeared to be more effective than core decompression and nonvascularized fibular grafting in patients with early-stage osteonecrosis of the femoral head. Long-term results are needed to determine whether the effect of this novel method of treatment for osteonecrosis of the femoral head endures.