The aim of this article is to provide a concise review of the basic science of extracorporeal shock wave therapy (ESWT) and to perform a systematic review of the literature for the use of ESWT in the treatment of fractures and delayed unions/nonunions. Articles in the English or German language were identified for the systematic review by searching PubMed-MEDLINE from 1966 until 2008, Cochrane Database of Systematic Reviews, Cochrane Database of Abstracts of Reviews of Effects, Cochrane Central Register of Controlled Trials, and relevant meeting abstracts from 2007 to 2008. Moreover, the bibliographies of the identified articles were reviewed. We included clinical outcome studies of ESWT in the treatment of fractures and delayed unions/nonunions. Reports with less than 10 patients were excluded. Nonunions after corrective osteotomies or arthrodeses were excluded. Sample size, level of evidence, definition of delayed union, definition of nonunion, time from injury to shock wave treatment, location of fracture, union rate, and complications were extracted from the identified articles. Data of 924 patients undergoing ESWT for delayed union/nonunion were extracted from 10 studies. All articles were graded as level 4 studies. The overall union rate was 76% (95% confidence interval 73%-79%). The union rate was significantly higher in hypertrophic nonunions than in atrophic nonunions. Data from level 4 studies suggest that shock wave therapy
seems to stimulate the healing process in delayed unions/nonunions. However, further investigations are required.