

Paper #212

The Effect of Postoperative Extracorporeal Shock Wave Therapy for Jones Fracture

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Summary:

Postoperative Extracorporeal Shock Wave Therapy for Jones fracture shorten the period of bone union and return to play from the surgery.

Abstract:

Purpose

Jones fracture occurs in high level athletes. The goal of its treatment is not to get the bone union but the quickest return to their previous sports activity. Primary surgery is the standard care for athletes but there still remain a common occurrence of delayed union or non-union. Extracorporeal Shock Wave Therapy (ESWT) is well known to have a potential to enhance bone healing. The purpose of this study was to investigate the usefulness of postoperative ESWT for Jones fracture.

Materials And Methods

22 patients who received intramedullary screw fixation for Jones fracture were indicated in this study. Patients were divided into surgery group (group S) and surgery with ESWT group (group E). 12 feet (10 male, 2 female, age 19.3 ± 3.7 years) assigned in group S and 10 feet (7 male, 3 female, age 17.5 ± 1.9) assigned in group E. According to Torg classification, 6 feet (group S: 2, group E: 4) were classified as type I, 15 feet were classified as type II and 1 foot (group S: 1) were classified as Type III. 4.5mm solid cancellous screw or tapered headless screw was used for intramedullary fixation. Group E received 1 to 3 times of ESWT every 2 weeks postoperatively. The energy flux density was 0.07 to 0.45 mJ/mm², 3000 to 5000 impulses were applied per session. The periods of bone union and return to play from the surgery were evaluated and compared between two groups. Bone union was defined as complete obliteration of the fracture line in plane radiographs.

Results

The mean time to complete bone union after surgery were 10.3 ± 2.9 weeks in group S and 7.1 ± 2.6 weeks in group E. The mean time to return to full activity level from the surgery were 11.7 ± 2.6 weeks in group S and 7.9 ± 1.9 weeks in group E. There were significant differences in the time for bone union and time for return to play among two groups. There was no re-fracture case in both groups.

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Discussion

Basic study shows the efficacy of ESWT for bone healing. It stimulates osteoblast and resulting in an increased bone mass and bone strength. It also stimulates mesenchymal stem cell recruitment and differentiation into bone forming cells. From its osteogenic effect, ESWT is used for non-union fracture and stress fracture. Many studies confirm that ESWT increases angiogenesis related markers and produces a significantly higher number of neo-vessels. Jones fracture occurs in proximal 5th metatarsal where watershed area exists, and its poor vascularity makes a difficulty in bone union. The angiogenesis effect of ESWT might work for this disadvantage and accelerates bone formation.

Conclusion

Postoperative ESWT for Jones fracture shorten the period of bone union and return to play.