Treatment of seawater immersion-complicated open-knee joint fracture


1Department of Orthopaedics, The 180th Hospital of PLA, Quanzhou, China
2State Key Laboratory of Trauma, Burns and Combined Injury, Department 4, Research Institute of Field Surgery, Daping Hospital, Third Military Medical University, Chongqing, China

Corresponding author: J.G. Ai
E-mail: jianguoai.cn@163.com

Received June 17, 2013
Accepted March 24, 2014
Published July 25, 2014
DOI http://dx.doi.org/10.4238/2014.July.25.6

ABSTRACT. The current study aimed to select suitable remedies for seawater immersion-complicated open-knee joint fracture by exploring the effects of different treatment methods. Forty adult rabbits weighing 2.20 ± 0.25 kg were divided equally into internal fracture fixation group (A), seawater-immersed group with primary internal fixation (B), seawater-immersed group with secondary internal fixation (C), and seawater-immersed group with external fixation (D), using the random-digit table method. Open-femoral internal condylar fracture models were established. Group A was left untreated for 2 h, whereas the other three groups were subjected to seawater immersion for 2 h. Afterwards, groups A and B underwent debridement and steel plate and screw internal fixation. Group C underwent debridement and external fixation, which was followed by secondary steel plate and screw internal fixation after the wound healed. Group D underwent transarticular arthrodesis. Wound infection, joint functional rehabilitation, and radiological and histopathological changes in fracture healing in each group were assessed. The results showed that delayed internal fixation effectively
reduces the infection rate of seawater immersion-complicated open fracture and benefits joint function rehabilitation.

**Key words:** Seawater immersion injury; Knee joint; Open fracture; Fracture fixation; Rabbit