

Early Standing with Prosthesis and Orthosis in a Transtibial Amputation with Other Limb Fractures

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Introduction

Lower limb amputation due to an external injury commonly accompanies fracture in the other limb, which hinders early mobilization with prosthetic fitting of the amputee side until complete healing of the fracture. Many cases often result in poor rehabilitative outcome as excessive immobilization causes muscle atrophy, joint contracture, synovial adhesions, and cartilage degeneration. This Case report reveals an exemplary good outcome of early standing training for a lower limb amputation combined with the other limb fractures.

Case report

A 75-years-old man suffered from a crush injury by a metal beam falling on October 19th, 2013. At the day of the accident, he undertook transtibial amputation on right leg and external fixator insertion for left tibial shaft open fracture. Five days later, he received open reduction and internal fixation for fractures in left medial condyle, distal radius and ulna. He was transferred to rehabilitation ward on 28th November. Prosthesis prescription took place at the same time with the evaluations for underlying cardiopulmonary function, nutrition, and psychologic status. Nine days later, partial weight bearing on amputee leg with prosthesis initiated on a tilt table twice a day. His prosthesis was composed of patellar tendon bearing socket, silicon suction typed suspension, endoskeletal shank, energy-storing ankle and dynamic response foot. On 19th December, 2013 he was discharged for improved general condition while waiting for healing of Lt. upper limb and lower leg fractures. Before 2nd admission, He did self exercises including stretching for prevention of contracture, strengthening of hip and knee muscles on the amputee side. Weight bearing exercise with prosthesis continued. After 4 months, on 9th April, 2014 he was re-admitted to rehabilitation ward for gait training. X-ray of Lt. tibiofibular fractures still showed incomplete healing but with progress of callus formation. Parallel bar walking with prosthesis and the other on KAFO was initiated from 10th April, 2014. Enough wt. bearing to promote bone union was applied without a full wt. lode to fractured side. Gait training gradually progressed to walking with monocane from 13th May and walking on ramp from 30th May. After 1 year since injury, he could walk up and down stairs while holding bar and lower leg fractures were healed.

Discussions

Combined fractures are common in lower limb amputation from trauma. There are many complications such as wound infections or non-unions, which tend to delay rehabilitation until complete healing of the fracture. In this case, early wt. bearing training with prosthesis results in good rehabilitative outcome. Here, the initial purpose of prosthesis fitting was not for gait training but for early standing. Restoring the physical condition through early standing with a proper prosthesis and orthosis may shorten rehabilitation period, promote bone healing, and finally advance functional independence.



Progression of bone union on serial X-ray of left tibiofibular fracture : post-operation status



Progression of bone union on serial X-ray of left tibiofibular fracture : at the time of transferring to rehabilitation



Progression of bone union on serial X-ray of left tibiofibular fracture : 1 year after injury