



Title: Treatment of complex foot & ankle deformities combined with neurotrophic deficiency

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Abstract:

Objective: To investigate the Ilizarov technique in the treatment of complex ankle deformity complicated with neurotrophic disorder. **Methods:** From January 2014 to May 2019, complicated ankle deformity with nerve injury was treated. Among them, there were 5 cases with obvious reduction of ankle and foot sensation in spina bifida sequelae, 1 case with complete disappearance of sensation in the sole and part of the back of the foot, and 4 cases with injury of the common peroneal nerve after trauma. Unilateral in 6 cases, bilateral in 4; 2 cases with lower leg bone scar; 2 cases with limb shortening greater than 5 cm; 7 cases had compression ulcer before operation; ankle joint activity range was less than 10° in 8 cases; 6 males and 4 females; Age 13-57, average 27.9. Time to treatment 10-30 years, average 26 years. Preoperative assessment of soft tissues of the foot and ankle, whether combined with compression ulcer, infection, whether the need for preoperative management; foot and ankle muscle strength; According to the principles of Paley deformity correction, the deformity center of rotation angulation (CORA) was determined, and the configuration of the circular external fixator was personalized designed. Minimally invasive surgery, muscle balance, and circular external fixator were applied to gradually correct each deformity. All patients wore orthopedic shoes and walked from partial load to full load within 1 week after the operation. All patients were discharged from the hospital 3-6 days after the operation, followed up, adjusted the external fixator and rehabilitation under the guidance of our teams. After the mineralization of regenerated bone reached the standard of bone healing, the external fixator was removed, protected with orthoses for 3-6 months. The ankle and hindfoot scoring system of AOFAS was used to evaluate the function before and after the treatment. **Results:** 10 patients were followed up for 12 months to 3 years, with an average of 1.9 years. The deformity of all 10 patients was corrected for 2– 6 months, and the removal time of the external fixator was from 5 months to 1.5 years. Neurological function recovered in 3 cases during the treatment. The AOFAS score was (90.2 ± 9.0), which was significantly higher than that before operation (41 ± 9.1) (P < 0.01). The AOFAS score was excellent in 4 cases, good in 5 cases, and fair in 1 case. **Conclusion:** Ilizarov technique combined with minimally invasive osteotomy and muscle balance can safely correct complex ankle deformity complicated with the neurotrophic disorder.