

One-step Management of Severely Deformed, Long-Neglected Club Feet

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Introduction/Purpose: Early management of the club foot using the Ponsetti technique has almost eliminated severe residual deformities from this problem. Unfortunately, in remote regions of the world patients may not have been afforded the benefits of this technique. The consequences are severely deformed, long-neglected foot deformities. Interventions to mitigate this problem have included talectomies, osteotomies, tendon transfers, gradual corrections using Ilizarov principles and as a last resort, transtibial amputations. All have undesirable features such as inadequate corrections with residual deformities, need for additional surgeries, intensive post-operative management and/or need for custom orthotics or prostheses. We propose a one-stage, single setting approach to this problem that fully realigns the foot and requires minimum of post-operative management.

Methods: During a 2017 humanitarian mission to Vietnam, six patients with severely deformed, long-neglected club feet were managed at a remote orthopaedic rehabilitation facility using our one-stage, single surgery approach. The six-step procedure included: 1) Percutaneous tri-hemisectomies (Hoke) of the Achilles tendon, 2) Excision of lateral ulcers/bursas, 3) Minimally invasive releases of all constricting soft tissues structures, 4) Closing wedge osteotomy at apex of deformity, 5) Manual reduction to achieve plantigrade foot, and 6) Maintenance of correction with temporary spanning external fixation in five patients and percutaneous Steinmann pins in a four-year old patient. No tendon transfers were done. No tourniquets or perioperative antibiotics were used with these minimally invasive and percutaneous interventions. At six weeks, the external fixation was removed, walking casts were applied with minimal manipulations to optimally position the feet. At 12 weeks the casts were removed, patients allowed to use footwear of their choosing.

Results: Follow-ups initially obtained weekly, then monthly through e-mails by a co-author fluent in Vietnamese were supplemented with photographs. Near-plantigrade feet axially aligned with the leg were obtained with all the initial corrections. By 48 hours pain was reported as minimal even though marked tension occurred across intact joint capsules in order to achieve the corrections. One skin, pin tract infection was reported that resolved once the pin was removed. Follow-up information at six months report that the corrections have been maintained with high satisfaction in all patients.

Conclusion: Our innovative approach to deformed, neglected club feet is supported by appreciating the biomechanics of the problems. Dynamic deforming forces (tendons and muscles) must be released. Tendon transfers are inadequate to correct contractures. Bony deformities must be osteotomized. Viscoelasticity of ligaments and joint capsules deform with time and need not be released; corrections initially obtained using the fixators become permanent with time. Our experiences support the use of our approach for the patient population with which we dealt and suggest that earlier soft tissue releases of dynamic deforming forces be done in conjunction with the Ponsetti technique.