

Abstract

The ideal scenario for ulnar nerve and median nerve repair is primary end-to-end neurorrhaphy in a tension-free environment. However, this could be complicated by soft tissue loss, scarring, and neuroma formation in a delayed injury, creating a nerve defect. With a wrist-level nerve defect, a flexion position can help shorten the nerve gap; however, maintaining the position can be challenging intraoperatively and postoperatively. Previously, we proposed our method of using a 2.0-mm K wire for radius-lunate-capitate pinning of the wrist in flexion to minimize the nerve gap, thereby facilitating neuroma excision and end-to-end neurorrhaphy in delayed ulnar and median nerve injury.

High median nerve injury presents a particular challenge for reconstructive surgery because the distance from the injury site to the intrinsic hand muscles far exceeds the range covered by axonal regeneration. Distal nerve transfer has become a breakthrough reconstruction strategy for high-level injuries in recent years. Its principle is to move the coaptation site closer to the target muscle, thereby bypassing the inherent long-distance regeneration limitations of proximal repair, effectively shortening the regeneration distance and preserving end-organ viability. However, for complex high median nerve injuries requiring simultaneous repair of both motor and sensory functions, the literature lacks comprehensive case reports and follow-up on the staged hybrid reconstruction strategy, which combines proximal branch-directed repair and multiple distal nerve transfers. Therefore, surgical strategy planning and early efficacy observation for such complex injuries are areas worthy of further research.