

Growing the PIP straight with the Digit Widget

All PIP contractures are secondary to force imbalance. There is either too much flexor torque or not enough extensor torque or a combination of the two. In Dupuytren's disease, at least initially, all PIP contractures are secondary to increased flexor torque. In advanced and long standing contractures, especially those with previous surgery, decreased extensor torque serves to frustrate the surgeon's best efforts at restoring joint extension.

As Dupuytren's progressively limits PIP extension, ***all*** tissues palmar to the joint's axis of rotation contract thereby creating additional short, but otherwise normal, collagen to join the disease itself as a mechanical constraint to active and passive extension.

Each angular degree of PIP contracture produces a secondary force imbalance for its MP joint and thereby creates a torque imbalance that favors MP hyperextension. Ironically, the contracture Dupuytren's creates at the PIP is easier to treat if there is a concomitant MP contracture...ideally one just adequate to prevent MP hyperextension. Such constraints to MP hyperextension assure maximal transmission of intrinsic and extrinsic muscle forces to extend its interphalangeal joints.

External splints and casts are impotent to reverse PIP contractures; their potential to reverse contractures are limited by their interface pressures that create ischemic skin: 30 grams/square cm is about all the precious dorsal skin can take.

Skeletal extension torque reverses PIP contractures by "growing" the contracted tissues back toward normal length. By transmitting forces to the joint via skeletal pins, extension torque creates a selective growth of short tissues. Extension torque causes skin and joint capsule on the extensor side of the PIP to exhibit the opposite phenomenon by contracting. Most importantly, extension torque avoids the soft tissue tearing and hemorrhage that accompanies joint manipulation into extension.

Simple mechanical analysis of finger contractures is of value in approaching all finger contractures.