Neuroma of the distal posterior interosseous nerve

A CAUSE OF IATROGENIC WRIST PAIN

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We describe four women and two men who had persistent wrist pain and reduced function after minor operations on the dorsum, usually for ganglia. They had diffuse pain and paraesthesia over the dorsum of the wrist, thumb, index and middle fingers, which was worse and different from that before operation.

They all had temporary relief of symptoms after block of the posterior interosseous nerve with bupivacaine. Later, excision of the terminal branches of the nerve at the wrist cured three patients completely and gave marked improvement in the other three, with no complications.

Great care is required at operations on the dorsum of the wrist, but pain from a neuroma can be relieved by local excision.

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Simple procedures on the wrist sometimes cause persistent and disabling chronic pain. One possible cause is a neuroma of the posterior interosseous nerve (PIN), which is not well described in anatomy texts.

The PIN passes deep to the superficial head of supinator, then divides into a motor branch and a mixed nerve. The motor branch supplies the superficial extensors of the forearm (extensor carpi ulnaris, extensor digitorum communis and extensor digitorum minimi). The mixed nerve divides into a motor branch to the deep extensor muscles of the forearm (extensor pollicis longus, extensor pollicis brevis, abductor pollicis longus, extensor indicis) and a sensory branch which emerges on the radial aspect of the wrist and

terminates at the radial border of the fourth extensor compartment deep to extensor digitorum communis. It supplies afferent twigs to the dorsal wrist capsule, the dorsal intercarpal ligaments, the intercarpal joints and the carpometacarpal joints of the index, middle and ring fingers.^{1,2} This sensory branch of the PIN is thought to have a proprioceptive function; damage may cause ill-defined burning discomfort on the dorsum of the wrist and hand, in a pattern different from that of a neuroma of a sensory cutaneous nerve. Such pain may persist, but can be abolished by excision of the distal nerve.³

Patients and Methods

We reviewed four women and two men referred to Wrightington Hospital with chronic pain in the right wrist and reduced movement after previous surgery. Five had undergone excision of ganglia and one a Blatt procedure. Three of the patients had had repeated excision of ganglia at the same site. Before ganglionectomy, they all had the typical aching sensation after activity, but after operation pain had become worse with radiation indicative of nerve damage. The symptoms had lasted from seven months to 15 years (mean 47.5 months). Follow-up after excision of the neuroma was from six months to five years (Table I).

The diagnosis of neuroma of the PIN was made and confirmed by temporary relief of pain and improvement in the range of movement after injection of local anaesthetic around the distal PIN at 3 cm proximal to the radiocarpal joint. The distal part of the nerve was then excised at operation.

Results

Three of the six patients had complete relief of pain and two reported definite improvement in its intensity. All patients have returned to their previous occupation, although one is awaiting arthroscopy for carpal instability. All reported an improvement in wrist movement with loss of stiffness.

In all six, histological examination confirmed that the nerve specimen contained the abnormally large amount of fibrous tissue seen in neuromas (Fig. 1).

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Table I. Details of six patients with neuroma of the posterior interosseous nerve

Case	Age (yr)	Gender	Occupation	Pathology	Duration of symptoms
1	50	M	Pattern moulder	Ganglion	5 yr
2	48	F	Nurse	Ganglion	1 yr
3	43	M	Painter and decorator	Ganglion	15 yr
4	22	F	Housewife	Blatt stabilisation	11 mth
5	33	M	Sales advisor	Ganglion	15 mth
6	26	F	Bartender	Ganglion	7 mth

Fig. 1

A high-power view of a resected distal PIN, showing the surrounding fibrous tissue.

Fig. 2

The normal appearance of the PIN at wrist level.

Discussion

The superficial sensory branch of the radial nerve often forms a neuroma, either because of inherent susceptibility or because of the frequency of surgery over its superficial position on the dorsoradial aspect of the wrist. Once a neuroma is established, it is refractory to treatment.⁴⁻⁶ Injury to the terminal branches of the PIN at the wrist is less frequently recognised, but may result from operation on the dorsal capsule of the wrist.

After the radial nerve divides high in the forearm, the PIN passes through supinator as a large branch which runs distally towards the wrist. The distal nerve and its accompanying artery pass behind the interosseous membrane and pronator quadratus into the third and fourth extensor compartments (Fig. 2). Damage to the nerve is usually distal to the wrist, and may cause tethering, producing pain on palmar flexion of the wrist which may also inhibit movement.

The six patients whom we report all developed chronic pain after routine minor operations. The pain was more severe and different from that before operation. All had temporary relief after local anaesthesia, and excision of the distal part of the nerve reduced or abolished wrist pain and improved function. There were no complications, as reported by others.^{7,8}

Simple ganglionectomy at the dorsum of the wrist should be undertaken only with due consideration of the course of the PIN and its branches. Careful dissection can avoid a preventable cause of pain and disability. When a painful neuroma has developed, early diagnosis and treatment can cure or minimise pain and disability.

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