Remote acute suppurative tenosynovitis secondary to carpal tunnel release under local anaesthesia

Lowell A Hughes MB BS FRCS(ED) Gordon H Knutson MD FRCSC
Division of Plastic Surgery, University of Toronto, Toronto Western Hospital, Toronto, Ontario

LA Hughes, GH Knutson. Remote acute suppurative tenosynovitis secondary to carpal tunnel release under local anaesthesia. Can J Plast Surg 1993;1(2):95-97. A case of acute suppurative tenosynovitis following carpal tunnel release under local anaesthesia is presented. This complication is believed to have resulted from injection contamination of the flexor tendon sheath during the administration of local anaesthesia. This is supported by the fact that the incisional wound remained healthy and healed uneventfully.

Key Words: Carpal tunnel release, Local anaesthesia, Suppurative tenosynovitis

Téosynovite suppurée aigüe secondaire à un dégagement du tunnel carpien sous anesthésie locale

RÉSUMÉ : Un cas de téosynovite suppurée aigüe secondaire à un dégagement du tunnel carpien sous anesthésie locale est présenté. Cette complication serait attribuable à une contamination de la gaine du tendon fléchisseur lors de l’administration d’une anesthésie locale par injection. Cela est appuyé par le fait que l’incision est demeuré saine et a cicatrisé sans problème.

Carpal tunnel release (CTR) is a commonly performed procedure for entrapment neuropathy at the wrist. This operation is usually uncomplicated and has predictable results.

Even though complications associated with CTR are rare, a number of these have been reported, including infection, palmar hematoma, severance of the motor branch of the median nerve, injury to the palmar cutaneous branch of the median nerve, incomplete sectioning of the carpal ligament, malposition of the median nerve, bow stringing of the flexor tendon, tendon adhesions, reflex sympathetic dystrophy, hypertrophic scars and wrist stiffness (1-4).

Infection is generally accepted as a potential complication of any surgical procedure, but is rarely encountered following CTR. When reported, it is usually related to wound infection. A case of CTR which was complicated by remote acute suppurative tenosynovitis in the absence of a wound infection is presented.

A 51-year-old female patient was referred to a senior hand surgeon after she was evaluated by her general practitioner for typical signs and symptoms of bilateral carpal tunnel syndrome. The patient had nerve conduction studies which revealed delayed conduction across the carpal tunnels bilaterally.

On November 5, 1991 she was taken to the operating room where a carpal tunnel release was performed on her right (dominant) hand under local anaesthesia. The local anaesthetic technique consisted of a 2% solution of lidocaine with 1:200,000 adrenaline, injected just proximal to the wrist crease between the flexor carpi radialis (FCR) and palmaris longus (PL) to block the median nerve, and then infiltrated distally towards the palm, superficial to the transverse carpal ligament.

A 4 cm incision was made in the proximal palmar crease as shown in Figure 1A. An uncomplicated carpal tunnel release was performed under direct vision with the use of loupe magnification (x 3.5). An external neurolysis was performed, completely freeing the nerve from surrounding structures and carefully avoiding entry into any of the adjacent tendon sheaths.

The patient was discharged on the same day and returned to work the following morning. However, she started experiencing severe pain in the hand and had to discontinue work. She was reviewed by the surgeon that day and the wound appeared normal, with no evidence of a median nerve injury. She was given analgesics and advised to elevate her hand. Two days later her hand was swollen, red and tender over the palmar aspect of the proximal phalanx and dorsal aspect of the metacarpophalangeal (MCP) joint of the little finger. She was afebrile and the wound continued to look completely normal (Figure 1).

The patient was admitted to hospital where investigations revealed a raised erythrocyte sedimentation rate (126 mm/h) and an elevated white blood cell count (11.6x10⁹/L) (Table...
1). She was started on high dose intravenous penicillin and cloxacillin. In addition a splint was fabricated and her right hand strictly elevated. The next day the swelling was localized to the proximal portion of the little finger which was displaying a flexed attitude and active motion was restricted and painful. Attempts to extend her finger elicited pain and there was tenderness over the flexor tendon sheath. At this point the patient was suspected of having developed flexor tenosynovitis of the finger, but this diagnosis was difficult to rationalize.

On November 12, there was no satisfactory improvement, in spite of adding clindamycin to the antibiotic regimen. The patient was taken back to the operating room for exploration of the little finger. Under general anaesthesia the flexor tendon sheath of the little finger was explored through palmar and digital incisions. The operative findings included turbid fluid in and around the flexor tendon sheath and a fibrinous exudate, but no frank pus. Wound swabs taken for microscopy and culture testing revealed a few polymorphonuclear cells and a scant growth of diphtheroids after three days. Surgical treatment consisted of thorough irrigation with saline and bacitracin solution and the placement of a penrose drain in the involved site with loose approximation of the wound edges (Figure 2).

**Table 1:** Summary of the white blood cell (WBC) count and erythrocyte sedimentation rate (ESR)

<table>
<thead>
<tr>
<th>Day</th>
<th>WBC ($x10^9$/L)</th>
<th>ESR (mm/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 23, 1991</td>
<td>7.3</td>
<td>N/A</td>
</tr>
<tr>
<td>November 9, 1991</td>
<td>11.6</td>
<td>126</td>
</tr>
<tr>
<td>November 10, 1991</td>
<td>12.5</td>
<td>150</td>
</tr>
<tr>
<td>November 12, 1991</td>
<td>7.8</td>
<td>170</td>
</tr>
<tr>
<td>November 18, 1991</td>
<td>7.9</td>
<td>125</td>
</tr>
</tbody>
</table>

N/A Not available

Postoperatively the patient improved rapidly and was discharged on November 19, 1991 and started on hand therapy. On latest follow up exactly one year later she had complete relief of her carpal tunnel symptoms but had residual stiffness in her little finger with lack of full flexion and full extension (Figure 3).

**DISCUSSION**

Acute flexor tenosynovitis following CTR is a rare complication (1,2). Most infectious complications reported in the literature relate directly to wound infections, either superficial or deep. The risk factors associated with infection following CTR include the use of a surgical drain, flexor tenosynovectomy, and installation of steroid solution in the
carpal canal before wound closure (1). Although none of these factors were present in this case the patient developed a flexor tenosynovitis remote from the operation site and maintained a normal noninfected incision which healed uneventfully.

Our explanation for this complication centres on the possibility of entry into the flexor tendon sheath of the little finger during the introduction of the local anaesthetic at the wrist. This was probably followed by the tracking of contaminated material along the sheath which may be continuous in the little finger (the ulnar bursa).

The possibility that this infection was coincidental cannot be completely overlooked. However, in the absence of any trauma other than surgery, along with the timing of presentation and an anatomically plausible explanation, a coincidental occurrence of this nature seems unlikely.

This complication has not been seen before by the senior surgeon who has been performing this operation for more than 25 years. The unusual nature of this complication, in retrospect, led to some hesitation in the decision to explore this patient’s hand surgically.

We would like to highlight the importance of a cautious technique when using local anaesthesia for this procedure, bearing in mind this possible complication (5). The injection should be superficial to the carpal ligament, combined with a median nerve block just proximal to the carpal tunnel. The administration of local anaesthesia should be performed under sterile conditions, and may be augmented if necessary during the procedure. Should this complication arise, early surgical exploration is apparently superior to antibiotic therapy alone in the management of this potentially devastating situation.

REFERENCES