On-line Case Report

Neuropraxia of the palmar cutaneous branch of the ulnar nerve during carpal tunnel decompression

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Carpal tunnel syndrome is one of the most commonly encountered conditions in the hand clinic and carpal tunnel decompression is the most frequently performed procedure in hand surgery. It is an effective procedure for patients with carpal tunnel syndrome. However, there is a high risk of complications that can be avoided with an understanding of wrist anatomy, appropriate planning and execution. We highlight one such complication, a case of neuropraxia of the palmar cutaneous branch of the ulnar nerve that followed carpal tunnel decompression.

Key words: Carpal tunnel decompression – complication – motor branch of the ulnar nerve – neuropraxia – palmar cutaneous branch of the ulnar nerve

Carpal tunnel syndrome is one of the most commonly encountered hand conditions in clinics and, carpal tunnel decompression is the most frequently performed procedure in hand surgery. While surgical decompression is a popular and effective means of treatment, complications following carpal tunnel decompression have been reported in 12–20% of cases.¹ These include neurological complications from injuries to branches of the median nerve or the median nerve itself. These injuries are well documented and occur even in the hands of the well-trained surgeon who is aware of the proximity of the palmar cutaneous and motor branches of the median nerve to the plane of dissection.

Reports of injuries to the ulnar nerve during carpal tunnel decompression are less common within the literature.

We report a case of injury to the palmar cutaneous branch of the ulnar nerve and conclude that the surgeon must also be alert to the proximity of the palmar cutaneous and motor branches of the ulnar nerve.

Case Report

A 55-year-old lady was diagnosed with carpal tunnel syndrome in her left hand on the basis of her symptoms and clinical signs. She underwent carpal tunnel decompression of the affected hand with a longitudinal incision in line with the fourth ray. There were no reports of difficulty or abnormal findings during the procedure. At her first postoperative review 2 weeks after surgery, she reported a resolution of her initial symptoms but did complain of pain and paresthesia over the hypothenar region. Clinical examination confirmed altered sensation in the hypothenar region but there was no evidence of intrinsic or hypothenar wasting or weakness or any evidence of haematoma or infection.

At a review 2 weeks later, there was no change in the findings. The plan was to conduct electrophysiological tests if symptoms did not improve by her next visit.

However, 2 months after surgery her symptoms had started to improve and at the 4-month postoperative stage, the symptoms had completely resolved.

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Figure 1 Distribution of cutaneous nerves around a carpal tunnel incision.

A diagnosis of neuropraxia of the palmar cutaneous branch of the ulnar nerve was made and it was felt that it could have occurred due to excessive retraction of the wound margins by the self-retaining retractor used during surgery.

Discussion

Traditional teaching places great emphasis on preservation of the palmar cutaneous and thenar motor branches of the median nerve during carpal tunnel decompression. This has prompted surgeons to approach the transverse carpal ligament from its ulnar border to distance their approach as far as possible from these structures. This does, however, bring their approach closer to other important structures such as the palmar cutaneous and motor branches of the ulnar nerve and, indeed, the ulnar nerve itself.

Terrano *et al.*² reported three cases of division of the deep motor branch of the ulnar nerve as it passes distal to the hook of the hamate; they suggested this should be a landmark for the ulnar border of one's dissection. Engberand and Gmeiner³ reported two cases of laceration to the palmar cutaneous branch of the ulnar nerve and Favero and Gropper⁴ described partial division of the ulnar nerve itself, all following carpal tunnel decompression.

Cadaver dissections by Engberand and Gmeiner³ demonstrated that an incision on the ulnar side of the fourth ray may result in damage to the palmar cutaneous nerve whereas an incision in line with the fourth ray is safe in preserving both ulnar and median palmar cutaneous nerves (see Fig. 1).

In our case, an incision placed in line with the fourth ray resulted in an injury to the palmar cutaneous branch of the ulnar nerve.

Despite the use of a standard safe approach, one is still in close proximity to this branch. Self-retainer retractors applied close to nerves and used with undue tension can impart high pressures and inadvertently cause a traction or pressure neuropraxia. This should explain the sensory deficit noted in the distribution of the palmar cutaneous branch of the ulnar nerve.

Conclusion

1. A surgeon should balance his incision to reduce the possibility of damage to both median and ulnar nerve branches at the wrist and palm.
2. When dividing the carpal ligament, one should ensure the incision is placed with a safe margin radial to the hook of the hamate.
3. Soft tissue handling should be gentle and restrained. If self-retainers are used, care must be taken to avoid inappropriate traction or tension.

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