Transection of the Ulnar Nerve as a Complication of Two-Portal Endoscopic Carpal Tunnel Release

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The endoscopic technique for the surgical treatment of carpal tunnel syndrome has been used to decrease postoperative complication rates and hasten the patient's return to activities of daily living and employment. Despite the success of this procedure, complications may occur, such as release of incomplete retinaculum, severance of the median nerve, injury to the palmar branch of the median nerve and the thenar branch, injuries to vessels, and accidental release of Guyon's canal.

Carpal tunnel release has traditionally been performed using the classic open technique. While relief of symptoms is typically achieved in a high percentage of patients, complications such as insufficient releasing of flexor retinaculum, injury to palmar cutaneous nerve, tenderness of the subcutaneous nerves, reflex sympathetic dystrophy, strictures, intrafascicular fibrosis, and delayed return to work have been reported frequently [1–5]. The current trend in surgery using ever shorter incisions is directed towards reducing postoperative morbidity and recovery time [2,3].

We report a case with ulnar nerve transaction as a complication of the two-portal endoscopic carpal tunnel release to emphasize the potential for accidental injury to the ulnar nerve, especially for the inexperienced surgeon.

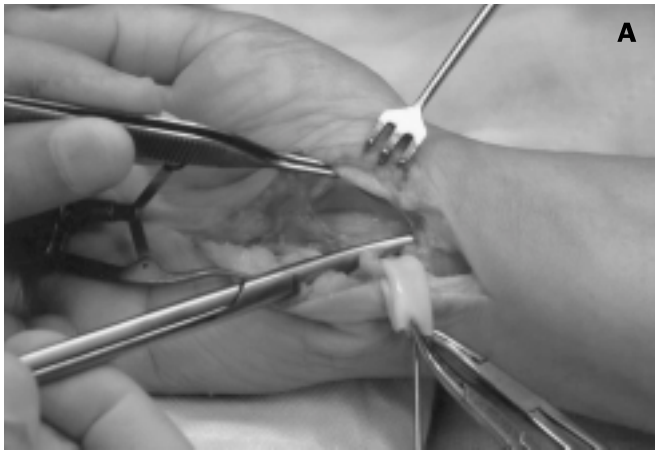
Patient Description

A 32 year old right-handed women presented to another hospital with a 3 month history of numbness and paraesthesias involving the median nerve distribution of the right hand. A clinical diagnosis of right carpal tunnel syndrome was confirmed electrodiagnostically. She underwent an endoscopic carpal tunnel release according to the Chow technique. She presented to us 3 months after her initial surgery with well-developed signs and symptoms of ulnar palsy and no relief of carpal tunnel symptoms. Electrodiagnostic studies performed 3 months after the surgery were consistent with persistent right carpal tunnel syndrome and injury of the ulnar nerve. The carpal tunnel and ulnar nerve were explored [Figure A]. The ulnar nerve was completely transected at the level of Guyon's canal [Figure B]. The nerve repair was performed. Ten months later, there was improvement in sensation to the fourth interdigital web space and the electrodiagnostic studies showed some recovery.

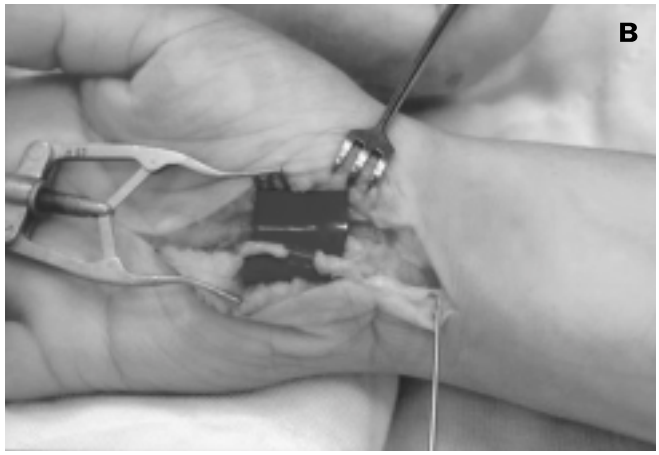
Comment

The current trend in surgery using ever shorter incisions is directed towards reducing postoperative morbidity and recovery time [1,2]. Patients undergoing endoscopic surgery may develop complications, such as insufficient releasing of the flexor retinaculum, tendon injury, and neurovascular injury such as lesion of the superficial palmar arch, severance of the motor branch of the ulnar nerve, transaction of the ulnar nerve, and injury to the median nerve [1–5].

We report an additional case with the major complication of complete ulnar



[A] Intraoperatively, it was seen that the retinaculum flexorum was not released.



[B] Intraoperatively, it was seen that the total transection of the ulnar nerve had occurred at the Guyon channel.

nerve transaction following endoscopic carpal tunnel release. The probable reason is that the primary surgeon had not received training in the procedure and had not performed this procedure on cadavers. Inadvertent initial placement of the trochar into Guyon's canal was performed by the inexperienced operator.

To our knowledge, four cases have been reported in the literature [1,3,4]. Nath et al. [3] reported total ulnar nerve transaction in their patient treated with the two-portal Chow technique. An ulnar nerve gap was reconstructed by sural nerve graft. This complication most likely occurred because of inadvertent initial placement of the trochar into Guyon's canal. Stark [4] encountered two cases of similar ulnar nerve injury related to the two-portal Chow method of endoscopic carpal tunnel release. He thought it would be possible to loop the ulnar neurovascular bundle around the two-portal endoscope if the endoscope was introduced medial to the ulnar neurovascular bundle rather than lateral radial to the ulnar neurovascular bundle. In the operation performed by De Smet and Fabry using the Chow technique under Bier block anesthesia, the ulnar nerve was completely transected [1]. Although these surgeons had trained on cadavers, they had little clinical experience at that point. Finally, a nerve repair was performed. They believed that the ulnar nerve could be lifted off and stretched over the slot of the cannula when the probe "hugged" the hook of the hamate. With extreme extension of the wrist the nerve would flatten and could be cut with the endoscopic knife.

Knowledge of relevant hand anatomy in the area of the carpal tunnel is mandatory. There is a tendency of surgeons to perform endoscopic carpal tunnel release for financial and recovery time reasons. However, endoscopic carpal tunnel release is more complex than standard open procedures and carries a risk for incomplete ligament release and damage to important anatomic structures [1,3]. The technique has a steep learning curve and requires that the operator practice on cadaveric specimens after attendance at one of the available courses. For this reason, we contend that endoscopic carpal tunnel release should not be performed because of demands by the instrument makers and patients.

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