

Surgical Outcome of Single-portal Endoscopic Carpal Tunnel Release Using a Forward-facing Knife in

1,000 Consecutive Hands

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Introduction

Endoscopic carpal tunnel release (ECTR) is becoming widely used as a minimally invasive surgical technique. Among endoscopic procedures, single-portal technique using a forward-facing knife has been rarely described. The authors present surgical experience of 1,000 ECTRs using a forward-facing knife.

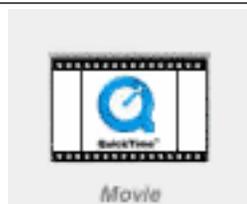
Methods

A total of 1,000 hands in 657 patients with electrodiagnostically-proven CTS underwent ECTR between Jan. 2001 and Mar. 2012. The patients consisted of 594 women (90.3%) and 63 men (9.7%) with a mean age of 53 years (range 20 to 84 years). There were 180 right, 136 left and 342 bilateral hands. Patient's postoperative satisfaction was assessed by improvement of preoperative symptoms, pillar pain and complications after the minimal 3-month postoperative period.

Single portal technique using a forward-facing knife

1. Anesthesia: local, regional, general
2. Arm exsanguination and tourniquet inflation
3. Layer by layer incision under loupe magnification
4. Subligamentous, extrabursal dissection
5. Introduction of slotted cannula
6. Insertion of telescope (2.7mm, 30°)
7. Division of transverse carpal ligament (TCL)
8. Layer by layer closure

Surgical Instruments



Transverse Carpal Ligament (endoscopic view)



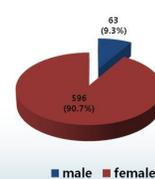
Lt: predivision, Rt: postdivision

Results

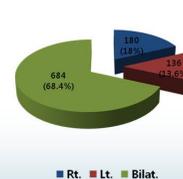
Among 1,000 hands, 970 (97%) hands were satisfied but 30 (3%) hands were dissatisfied. Incomplete release of TCL occurred in 12 hands of 30 dissatisfied hands. Nine hands with severe thenar muscle atrophies and severe electrodiagnostic abnormalities were not improved after ECTR. In addition, 2 hands associated with cervical disc disease, 1 hand with motor neuron disease and 1 hand with fibrolipomatous hamartoma of median nerve were not improved. Five hands of significant complications (one with ulnar nerve injury and the other four with common digital nerve injury) occurred in early experience of ECTRs. Severity of clinical manifestations, electromyogram and age were not correlated with surgical outcome respectively, but dissatisfied patients were older than satisfied ones. Cases of advanced CTS with weakness and muscle atrophy were associated with poor outcome but there's no statistical significance between clinical groups. In addition, symptom duration was not correlated with surgical outcome respectively.

Result of Surgical Experience

Gender of patients



Site of ECTR



Analysis of Poor Outcome

• 30 hands in 26 patients

1. Incomplete TCL release (12)
2. Severe cases (9)
 - severe thenar muscle atrophy
 - hand weakness
 - severe EMG abnormalities
3. Associated diseases (4)
 - cervical HNP (2)
 - motor neuron disease (1)
 - fibrolipomatous hamartoma (1)
4. Major complications (5)
 - common digital N. injury (4)
 - ulnar N. injury (1)

Conclusions

ECTR surgery using a forward-facing knife is an effective, minimally-invasive surgical technique with a low complication rate with cost-effectiveness.

Learning Objectives

By the conclusion of this session, participants should be able to describe the importance of endoscopic treatment of carpal tunnel syndrome and discuss surgical technique as well as complications.

References

1. Jimenez DF, Gibbs SR, Clapper AT: Endoscopic treatment of carpal tunnel syndrome: a critical review. J Neurosurg 88:817-826, 1998
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3. Chen AC, Wu MH, Chang CH, et al: Single portal endoscopic carpal tunnel release: modification of Menon's technique and data from 65 cases. International Orthopaedics 35:61-65, 2011