Predictors and Outcomes of Converting Endoscopic Carpal Tunnel Release to Open

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Background

- Compression of the median nerve at the carpal tunnel occurs in about 4.5.8% of adults in the United States.
- Carpal tunnel release for carpal tunnel syndrome (CTS) is commonly performed when conservative treatment has failed, leading to the most common hand operation in the United States, be it open carpal tunnel release (OCTR) or endoscopic carpal tunnel release (ECTR).
- Both OCTR and ECTR are well tolerated with no significant differences in complications, functional outcomes, or symptom severity. However, the conversion rate of having to convert from ECTR to OCTR is underdetermined, with rates ranging from <1% to 13.5%.

Objective:
We sought to evaluate:
1. conversion rates in ECTR to OCTR cases
2. the outcomes of OCTR to ECTR converted cases compared with successful ECTR cases
3. predictive risk factors of ECTR to OCTR converted cases

Patients and Methods

- All adult patients who underwent ECTR by a single surgeon over a 3-year period at a single institution were retrospectively studied (April 2015- July 2018).
- Conversion from ECTR to OCTR was defined as cases where MicroAire ECTR system was first attempted prior to OCTR.
- Outcomes included postoperative symptoms and functional recovery.
- Patient epidemiologic and electromyography characteristics were also assessed.

Results

Conversion rate
- During the 3-year study period, 13 (5.7%) patients required conversion to OCTR of the 225 patients in whom ECTR was first attempted.

Outcomes
- Reasons for conversion to OCTR included inability to safely visualize the carpal tunnel due to:
  - severity of inflammation (54%)
  - difficulty with introduction of endoscopic instrument (23%)
  - aberrant anatomy (15%)

Postoperative factors
- The endoscopic group reported residual numbness for an average of 2.3 (SD of 0.9) weeks while those in the conversion to open release reported residual numbness for an average of 8.6 (SD of 3.4) weeks. The difference in mean duration of residual numbness between the two groups was significant (P-value <0.01).
- Similarly, those in the endoscopic group had on average 1.7 (SD of 1.1) clinic follow-up visits while the conversion to open group had on average 3.5 (SD of 1.8) clinic follow-up visits. This difference in mean follow-up visits was significant (P-value <0.01).

Conclusions

- Conversion rate from ECTR to OCTR is low (5.7%).
- Converted patients had significantly higher rates of subjective numbness at 1-month follow-up compared to successfully completed ECTR cases.
- Concurrent diagnosis of tenosynovitis, severe compression on nerve conduction studies, and duration of disease are the strongest predictors for conversion from endoscopic carpal tunnel release to open surgery.

Take Home Messages

- Preoperatively: Patients with severe inflammatory tenosynovitis or prolonged duration of disease should be counseled that they may need conversion to open approach versus initial open approach.
- Intraoperatively: Conversion to open is advocated if difficulty during insertion of the blade or aberrant anatomy is recognized in order to avoid complications of median nerve injury and bleeding.

References