

Endoscopic Versus Open Treatment of Carpal Tunnel Syndrome: Postoperative Complications in patients with Diabetes Mellitus

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INTRODUCTION: Patients with Type 2 diabetes (T2DM) are at increased risk of developing carpal tunnel syndrome (CTS). CTS can be managed surgically with endoscopic carpal tunnel release (ECTR) or open carpal tunnel release (OCTR) when conservative measures fail. While these surgical methods have been studied extensively in the general population, limited information exists on outcomes of T2DM patients undergoing these procedures. This study aims to compare complication rates between ECTR and OCTR in the T2DM patient populations.

METHODS: This was a retrospective cohort study using the TriNetX database where we selected patients with T2DM who underwent ECTR or OCTR with T2DM and collected demographic data, medical comorbidities, and complication rates were analysed. The groups were matched and controlled for confounding variables. A multivariate analysis was performed to identify differences in postoperative complication rates in patients with T2DM undergoing either ECTR or OCTR.

RESULTS SECTION: We identified 56,741 patients with T2DM undergoing ECTR (N=14,949) or OCTR (N=41,792). Patients with T2DM undergoing ECTR had a significantly lower incidence of 90-day wound infection ($p<0.001$), 90-day wound dehiscence ($p<0.001$), and nerve injury ($p<0.001$) when compared to patients who underwent OCTR. After matching, there was a significantly higher number of T2DM patients undergoing ECTR who had peripheral vascular disease ($p=0.045$) and hypertension ($p=0.020$) when compared to the OCTR group. These patients also had a lower incidence of fluid and electrolyte disorders ($p=0.002$) and chronic blood loss anemia ($p=0.025$).

DISCUSSION: In the outcome measures identified by this study, ECTR yielded significantly lower rates of wound infection, wound dehiscence, and nerve injury within 90 days post-surgery compared to OCTR—reducing the risk by 31%, 58%, and 59%, respectively. Hand surgeons adept in both procedures should consider performing an ECTR rather than an OCTR in patients with T2DM due to the decreased postoperative complication risks.

CLINICAL RELEVANCE: T2DM is an independent risk factor contributing to CTS which can be managed surgically with CTR and an independent risk factor for postoperative complications in many surgeries. This study demonstrates that ECTR has less risk of postoperative complications compared to OCTR in patients with T2DM as there is a lower 90-day incidence of wound dehiscence, wound infection, and nerve injury.

Table 1. Matched Outcomes of Endoscopic Versus Open CTR in Patients with T2DM

Outcomes	RR	95% CI	p-value
90-Day Wound Infection	0.69	(0.57-0.83)	<0.001
90-Day Wound Dehiscence	0.42	(0.31-0.57)	<0.001
Nerve Injury	0.41	(0.24-0.71)	<0.001

RR, Relative Risk; CI, Confidence Interval