Motor Evoked Potential Recordings from the Urethral Sphincter Muscles (USMEP)

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Abstract

Introduction: *Bowel and bladder function are at risk during tumor resection of the conus, cauda equina, and nerve roots. This study demonstrates the ability to acquire Transcranial electrical Motor Evoked Potentials (TCeMEPs) from the urethral sphincter muscles (USMEP) by utilizing a urethral catheter with an electrode attached.*

Methods*: A retrospective analysis of IONM data from nine intradural tumors, four tethered cord releases, and two spinal stenosis procedures were performed (n15). The cohort included seven females and eight males (median 38.91 years). A catheter with urethral electrodes attached was used for recording TCeMEPs and s-EMG from the External Urethral Sphincters (EUS).*

Results: *USMEPs were obtained in 14 patients (93%). The reliability of TCeMEP from the External Anal Sphincter (EAS) was variable across all patients. In patient # 7, the TCeMEP recordings from the urethral sphincter were not present before incision; however, following the resection of the tumor, the USMEP*

recordings were obtained and remained stable for the remainder of the procedure. Patient # 7 had subsequent improvement in bladder function postoperatively. Patient # 4 exhibited a 50% increase in the amplitude of the USMEP as well following tumor resection. Patient # 4 also showed improved bladder function post-operatively

Conclusions: *In this small series, we were able to acquire consistent and reliable MEPs when recorded from the urethral sphincters. More study is needed to establish a better understanding of the value added by this modality. USMEPs can be attempted in surgeries that put the function of the pelvic floor at risk.*

Keywords: *External urinary sphincters, urinary incontinence, motor evoked potentials, cauda equina tumors, tethered cord.*