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Utility of neurophysiology in the diagnosis of tethered cord syndrome (TCS)

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Background: Tethered cord syndrome, a condition in which the spinal cord stretches as a child grows, can cause various clinical symptoms. Occult TCS (OTCS) is a condition where a child displays some or many clinical symptoms of TCS, but no radiographic abnormality confirms the presence of a tethered cord (1-4). Diagnosis of OTCS in children is invasive and multi-factorial. The current diagnostic approach involves three

main factors- clinical signs and symptoms, radiographic evidence, and motor evoked potentials (MEPs) tested under general anesthesia. Transcranial magnetic stimulation (TMS) is a non-invasive testing method for OTCS. It can replace MEPs, which are conducted under general anesthesia. Methods: We will conduct a case-control series of children at our center who have undergone TMS. We will characterize the children who have TCS and suspected OTCS and detail the children's current diagnosis methods and outcomes in a technical note. We will then compare their pre-operative and post-operative data. Results: So far, we have conducted TMS on 10 children to help diagnose occult TCS. Conclusions: This approach is a novel and effective way to improve the accuracy of diagnosis in children, potentially preventing unnecessary surgery, or detecting patients who would otherwise suffer from the condition.