Comparison of the Novel Coin Test and the Modified Japanese Orthopaedic Association (mJOA) Score in Assessing Cervical Spondylotic Myelopathy: Preliminary Results.

Introduction: Cervical spondylotic myelopathy (CSM) diagnosis often requires a combination of clinical evaluation such as Hoffman's and Tandem Gait, as well as further imaging modalities such as MRI for accurate diagnosis. The novel Coin Test (CT) introduces a simple yet effective assessment tool for evaluating upper extremity function, aiding in the diagnosis of CSM compared to other traditional assessment tools. This study aims to assess and correlate pre- and postoperative CT times and modified mJOA scores, as well as to explore potential correlations between CT results and severity of cervical cord compression observed on MRI scans in CSM patients.

Methods: A prospective observational study was conducted, comparing 32 patients diagnosed with CSM based on clinical examination findings and MRI scans. The novel CT was administered and recorded both pre- and postoperatively, in conjunction with mJOA scores. In the CT assessments, patients diagnosed with CSM were instructed to transfer five coins (dime) from a randomly arranged starting position on a flat surface to an adjacent stack. Subsequently, the duration required to complete this task was recorded for each patient. Cervical cord compression ratio was quantified for all 32 patients and subsequently compared with preoperative CT results and mJOA scores to evaluate correlation utilizing the Pearson correlation test.

Results: The study cohort had a mean age of 66 years old. The mean preoperative mJOA score was 11.9, indicating moderate CSM. Following anterior cervical decompression and fusion surgery, the mean postoperative mJOA score improved to 15.1, reflecting a shift to mild CSM. Preoperatively, the mean CT completion time was 34 seconds, which decreased to 16.8 seconds postoperatively, resulting in a mean improvement in CT completion time of about 17.4 seconds. The mean postoperative follow-up duration was 4.9 months. Statistical analysis using paired T-test revealed a significant decrease in CT time ($p < 0.001$) (fig. 1) and increase in mJOA scores ($p < 0.001$) (fig. 2) postoperatively. Furthermore, preoperatively, longer CT times were significantly associated with poorer mJOA scores, as evidenced by Spearman's Correlation test ($r = -0.646$; $p < 0.001$) (Fig. 3). Additionally, CT time exhibited a significant negative correlation with recorded cervical spine cord compression ratio, indicating that longer CT times correlated with more severe cord compression ($r = -0.498$; $p = 0.004$). Interestingly, there was no significant correlation observed between cord compression and the traditional mJOA score ($r = 0.305$; $p = 0.095$).

Conclusion: Our preliminary findings underscore the efficacy of the Coin Test (CT) as a simple and effective tool for assessing upper extremity function in CSM patients. CT times exhibited a promising significant correlation with disease severity, as evidenced by their association with both preoperative mJOA scores and cervical spine cord compression. These results highlight the potential of the CT to complement traditional assessments and provide valuable prognostic information for CSM management
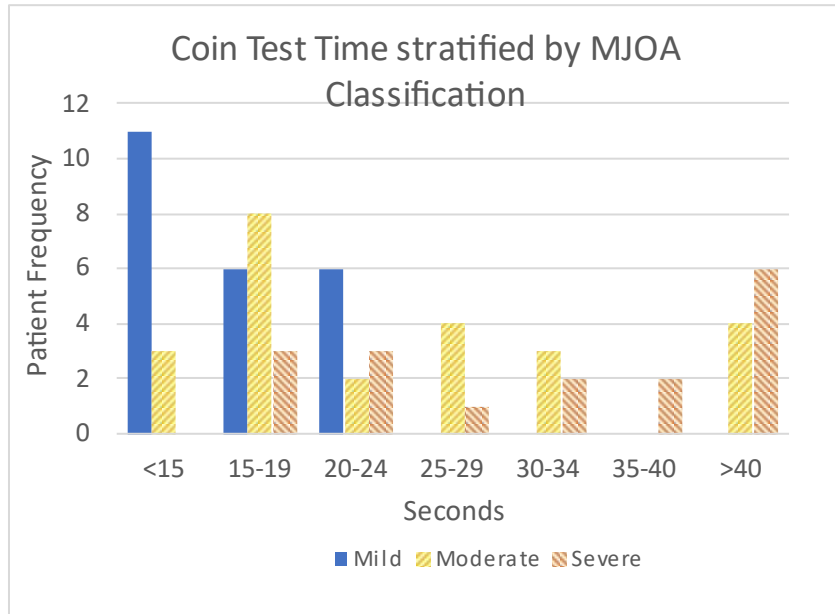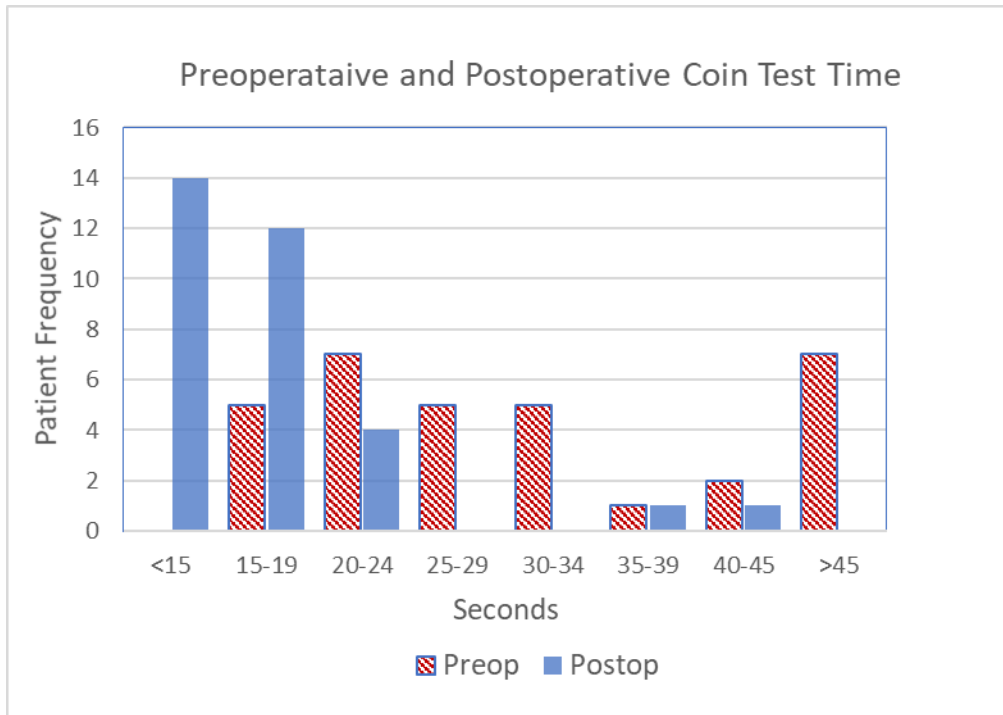
Figure. 1

Figure. 2

Figure. 3

Preoperataive and PostoperativeModified Japanese Orthopaedic Association Score