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The Construct Validity of the HUESAD (Hiroshima University Endoscopic Surgical Assessment Device)

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With the spread of endoscopic surgery, significant attention has been focused on training and education for safe endoscopic surgery. The establishment of a system for an objective assessment of endoscopic surgical skills is therefore needed. We developed our own motion analysis system, called the Hiroshima University Endoscopic Surgical Assessment Device (HUESAD), which can record the movement of the tip of an endoscopic instrument precisely. The aim of this study was to demonstrate the construct validity of the HUESAD

We analyzed three dexterity parameters (the integrated deviation, the peak velocity and the approaching time) from participants (experts and novices). These participants performed HUESAD tasks 5 times by each subject with the dominant hand. The data in the expert group were significantly lower than those in the novice group about the integrated deviation and approaching time (integrated deviation $p < 0.001$, approaching time $p < 0.001$). The peak velocity to perform tasks in the expert group were significantly faster than those in the novice group ($p = 0.007$).

In conclusion, the HUESAD is able to differentiate the endoscopic surgical skills between experts and novices by three dexterity parameters.