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## Comparison of three pain scales after impacted third molar surgery

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**Objective.** Recently, a pain assessment scale called “full cup test” (FCT) has been suggested for pain evaluation. It is claimed to be easier to use for the patient, and it allows using parametric tests for statistical analyses. The aim of this study was to evaluate the validity of the FCT in third molar surgery.

**Study design.** The FCT was compared with 2 well accepted pain scales. Forty-eight patients who had fully impacted lower third molars were included. All patients were asked to fill 3 pain scales—visual analog scale (VAS), verbal rating scale (VRS), and FCT—daily during the first postoperative week. Then the scales were collected and data statistically analyzed. Agreement among VAS, VRS, and FCT was evaluated using the Spearman rank coefficient.

**Results.** Correlations among 3 scales were very high and significant ( $P < .001$ ).

**Conclusions.** The FCT can be used to assess the postoperative pain after third molar surgery. (Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;112:715-718)

Surgical removal of impacted third molars is a common oral surgery procedure. It can be quite discomforting for the patients because of postoperative complications, such as bleeding, pain, swelling, trismus, and alveolar osteitis.<sup>1</sup> Among those complications, pain has probably the utmost importance for the patient, and pain intensity is thought to be one of the primary factors that influence the sense of well-being.<sup>2</sup>

Pain is a subjective complex experience, and there is not any tool to measure it objectively. Usually unidimensional scales, which measure only the sensory component of the pain, are used in pain research.<sup>3</sup> Although many pain assessment scales exist, there is not a standardized definition for each scale.<sup>4</sup> The visual analog scale (VAS), the verbal rating scale (VRS), and the numeric pain scale (NRS) are the best known and most commonly preferred scales. All of them were shown to be valid and they have different advantages and disadvantages.<sup>5,6</sup> For example, VRS is easy to understand for the patients and can be remotely applied by mail or by phone. However, its sensitivity is low and it does not allow using parametric tests.<sup>7</sup> VAS allows the use of parametric tests<sup>8</sup> and is therefore widely used in scientific papers, but it has more practical difficulties than VRS or NRS.<sup>7</sup>

There are also other less frequently used pain assessment methods, such as faces pain scale and color analog scale.<sup>9,10</sup> Recently, another pain scale, called “full cup test” (FCT), has been suggested to establish a self-reported pain evaluation. It is claimed to be easy to understand for the patient and it allows using parametric tests that are more powerful for statistical analyses.

The aim of the present study was to evaluate the validity of FCT in postoperative pain research in third molar surgery by comparing it with 2 well accepted pain scales, VAS and VRS.

### MATERIALS AND METHODS

The study was approved by the Ethical Committee of the Selcuk University Faculty of Dentistry. Forty-eight patients (17 men, 31 women, aged 17-27 years, mean age  $21.9 \pm 3.1$  years) who had fully impacted lower third molars were included to the study. Because the education levels of the patients could affect the use of pain scales and the outcomes,<sup>5</sup> the patients were selected from a similar education level. The surgical procedures were performed under local anesthesia in usual way. After the operations, the patients were given a form containing the pain scales, which would be completed daily for 6 postoperative days, including the day of surgery. The patients were fully informed about the scales, and a written explanation was also provided.

The form contained 3 pain scales: VAS, VRS, and FCT (Fig. 1). The VAS was a simple 10-cm horizontal line with word anchors of “no pain” at the left end and “the worst pain imaginable” at the right end. The patient would simply place a mark anywhere on the horizontal line. The VRS consisted of 4 verbal expres-

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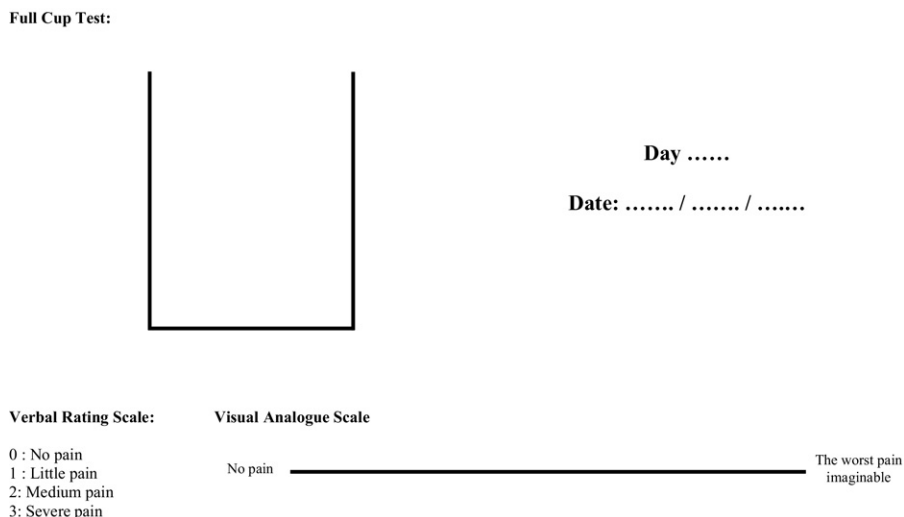


Fig. 1. Pain scales used in the study.

**Table I.** Correlation coefficients among 3 pain scales

Scales	Correlation coefficients
VRS and VAS	0.916
VRS and FCT	0.937
VAS and FCT	0.958

VRS, Verbal rating scale; VAS, visual analog scale; FCT, full cup test.

sions (0: no pain; 1: mild pain; 2: moderate pain; and 3: severe pain) which would be selected by the patient. The FCT was a simple “cup” drawing as described by Ergün et al.<sup>5</sup> The patients were told that the “cup” was completely full if their pain was the most severe and empty if they had no pain at all. The patients were asked to draw a horizontal line in the cup to indicate the pain level, as if the pain “filled the cup”. FCT scores were calculated as height of line/height of cup × 100.<sup>5</sup>

The patients were asked to mark the pain scales daily, and they were invited for removing the sutures and for examining the surgical wound in the postoperative seventh day. The forms were then collected, and data were analyzed using a statistical software package (Sigmastat version 3.5, Systat Software, Richmond, CA). Agreement among VAS, VRS, and FCT was evaluated using the Spearman rank coefficient. The patients were also asked which pain scale they found more comprehensible and easier to use.

**RESULTS**

None of the patients had serious surgical complications, and all patients completed the forms. Correlations among the 3 scales were very high (Table I) and significant ( $P < .001$ ; Figs. 2-4). The most preferred pain

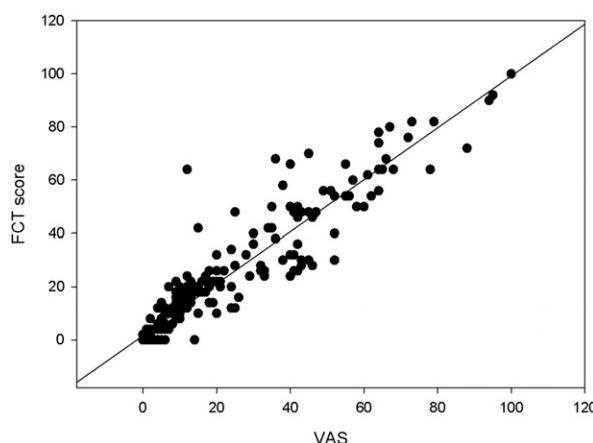


Fig. 2. Correlation between visual analog scale (VAS) and full cup test (FCT).

scale was VRS in 20 patients (41.7%), FCT in 17 patients (35.4%), and VAS in 11 patients (22.9%).

**DISCUSSION**

Pain measurement tools, i.e., pain scales, have been an important part of pain research, and many pain scales have been developed.<sup>5,6,9</sup> For a pain measurement instrument to be useful and valid, it must be easily understood and used by the subject, and it should compare well with other established methods of assessing pain. The validity of any pain measurement scale cannot be determined directly. One aspect of validity is a scale’s agreement with another recognized measurement scale. Another suggested method of assessing validity is by the response of the scale to pharmacologic

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