**Supplementary table 1.** Two-way repeated measures of analysis of variance (ANOVA) of pain VAS score at rest (Figure 2A)

|  |  |  |
| --- | --- | --- |
| Items | Statistics | *P* value |
| Mauchly’s Test of Sphericity | Chi-square=1427.459 | <0.001 |
| Treatment effect | F=10.036 | 0.001 |
| Time effect | F=223.037\* | <0.001 |
| Treatment\*time effect | F=6.599\* | <0.001 |

\* Greenhouse-Geisser correction. VAS = visual analogue scale.

**Supplementary table 2.** Comparison of pain VAS score at rest between two groups (Figure 2A)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Times points | EPA group (N=148), mean±SD | POA group (N=148), mean±SD | Mean diff. (95% CI) | Adjusted *P* value\* |
| -24h | 4.27±1.44 | 4.35±1.56 | -0.07 (-0.42~0.27) | 1.000 |
| -2h | 4.05±1.68 | 4.35±1.71 | -0.30 (-0.69~0.09) | 1.000 |
| 4h | 4.33±0.96 | 4.70±0.88 | -0.36 (-0.58~-0.15) | 0.008 |
| 8h | 4.39±1.49 | 5.07±1.19 | -0.68 (-0.98~-0.37) | <0.001 |
| 12h | 3.74±1.75 | 4.77±1.79 | -1.03 (-1.43~-0.62) | <0.001 |
| 24h | 3.10±1.62 | 3.24±1.62 | -0.14 (-0.51~0.24) | 1.000 |
| 36h | 2.22±1.28 | 2.24±1.12 | -0.02 (-0.30~0.25) | 1.000 |
| 48h | 2.05±1.30 | 2.03±1.19 | 0.02 (-0.26~0.30) | 1.000 |

\*Comparison was determined by the Student’s t test followed by Bonferroni's correction. method. VAS = visual analogue scale, EPA = early preoperative analgesia, POA = postoperative analgesia, SD = standard deviation, diff. = difference, CI = confidence interval.

**Supplementary table 3.** Comparison of percentage of patients with moderate-severe pain at rest between two groups (Figure 2B)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Times points | EPA group (N=148), No. (%) | POA group (N=148), No. (%) | Percentage diff.  (95% CI) | Adjusted *P* value\* |
| -24h | 100 (67.6) | 105 (70.9) | -3.4 (-13.9~7.1) | 1.000 |
| -2h | 90 (60.8) | 98 (66.2) | -5.4 (-16.4~5.6) | 1.000 |
| 4h | 121 (81.8) | 140 (94.6) | -12.8 (-20.2~-5.5) | 0.008 |
| 8h | 110 (74.3) | 135 (91.2) | -16.9 (-25.5~-8.3) | <0.001 |
| 12h | 82 (55.4) | 108 (73.0) | -17.6 (-28.5~-6.6) | **0.016** |
| 24h | 61 (41.2) | 63 (42.6) | -1.4 (-12.6~9.9) | 1.000 |
| 36h | 23 (15.5) | 18 (12.2) | 3.4 (-4.5~11.2) | 1.000 |
| 48h | 22 (14.9) | 16 (10.8) | 4.1 (-3.6~11.7) | 1.000 |

\*Comparison was determined by the Chi-square test followed by Bonferroni's correction. method. EPA = early preoperative analgesia, POA = postoperative analgesia, diff. = difference, CI = confidence interval.

**Supplementary table 4.** Two-way repeated measures of analysis of variance (ANOVA) of pain VAS score at flexion (Figure 2C)

|  |  |  |
| --- | --- | --- |
| Items | Statistics | *P* value |
| Mauchly’s Test of Sphericity | Chi-square=886.276 | <0.001 |
| Treatment effect | F=11.875 | 0.001 |
| Time effect | F=215.373\* | <0.001 |
| Treatment\*time effect | F=5.102\* | 0.001 |

\* Greenhouse-Geisser correction. VAS = visual analogue scale.

**Supplementary table 5.** Comparison of pain VAS score at flexion between two groups (Figure 2C)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Times points | EPA group (N=148), mean±SD | | POA group (N=148), mean±SD | | Mean diff. (95% CI) | Adjusted *P* value\* |
| -24h | | 4.61±1.71 | 4.80±1.88 | -0.19 (-0.60~0.22) | | 1.000 |
| -2h | | 4.53±1.69 | 4.88±1.68 | -0.34 (-0.73~0.04) | | 0.640 |
| 4h | | 4.80±1.04 | 5.21±1.03 | -0.41 (-0.64~-0.17) | | 0.008 |
| 8h | | 4.98±1.63 | 5.66±1.29 | -0.68 (-1.02~-0.35) | | <0.001 |
| 12h | | 4.28±1.79 | 5.33±1.87 | -1.05 (-1.47~-0.63) | | <0.001 |
| 24h | | 3.62±1.64 | 3.74±1.69 | -0.11 (-0.50~0.27) | | 1.000 |
| 36h | | 2.56±1.37 | 2.61±1.24 | -0.05 (-0.35~0.25) | | 1.000 |
| 48h | | 2.30±1.43 | 2.35±1.31 | -0.04 (-0.35~0.27) | | 1.000 |

\*Comparison was determined by the Student’s t test followed by Bonferroni's correction. method. VAS = visual analogue scale, EPA = early preoperative analgesia, POA = postoperative analgesia, SD = standard deviation, diff. = difference, CI = confidence interval.

**Supplementary table 6.** Comparison of percentage of patients with moderate-severe pain at rest between two groups (Figure 2D)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Times points | EPA group (N=148), No. (%) | POA group (N=148), No. (%) | Percentage diff.  (95% CI) | Adjusted *P* value\* |
| -24h | 103 (69.6) | 109 (73.6) | -4.1 (-14.3~6.2) | 1.000 |
| -2h | 103 (69.6) | 112 (75.7) | -6.1 (-16.2~4.1) | 1.000 |
| 4h | 131 (88.5) | 144 (97.3) | -8.8 (-14.6~-2.9) | **0.024** |
| 8h | 121 (81.8) | 144 (97.3) | -15.5 (-22.5~-8.6) | <0.001 |
| 12h | 93 (62.8) | 122 (82.4) | -19.6 (-29.8~-9.4) | **0.016** |
| 24h | 76 (51.4) | 77 (52.0) | -0.6 (-12.1~10.7) | 1.000 |
| 36h | 36 (24.3) | 33 (22.3) | 2.0 (-7.6~11.7) | 1.000 |
| 48h | 33 (22.3) | 26 (17.6) | 4.7 (-4.4~13.8) | 1.000 |

\*Comparison was determined by the Chi-square test followed by Bonferroni's correction. method. EPA = early preoperative analgesia, POA = postoperative analgesia, diff. = difference, CI = confidence interval.

**Supplementary table 7.** Two-way repeated measures of analysis of variance (ANOVA) of PGA score (Figure 3)

|  |  |  |
| --- | --- | --- |
| Items | Statistics | *P* value |
| Mauchly’s Test of Sphericity | Chi-square=702.480 | <0.001 |
| Treatment effect | F=15.049 | <0.001 |
| Time effect | F=234.359\* | <0.001 |
| Treatment\*time effect | F=4.450\* | 0.001 |

\* Greenhouse-Geisser correction. PGA = patient global assessment.

**Supplementary table 8.** Comparison of PGA score between two groups (Figure 3)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Times points | EPA group (N=148),  mean±SD | | POA group (N=148), mean±SD | Mean diff. (95% CI) | Adjusted *P* value\* |
| -24h | | 5.47±1.78 | 5.56±1.74 | -0.09 (-0.50~0.31) | 1.000 |
| -2h | | 5.01±1.68 | 5.40±1.76 | -0.39 (-0.79~0.00) | 0.408 |
| 4h | | 5.29±1.09 | 5.67±1.03 | -0.38 (-0.62~-0.14) | **0.016** |
| 8h | | 5.41±1.59 | 6.13±1.36 | -0.72 (-1.06~-0.38) | <0.001 |
| 12h | | 4.76±1.84 | 5.77±1.77 | -1.01 (-1.42~-0.59) | <0.001 |
| 24h | | 3.83±1.61 | 4.22±1.71 | -0.39 (-0.77~-0.01) | 0.344 |
| 36h | | 3.02±1.34 | 3.14±1.24 | -0.11 (-0.41~0.18) | 1.000 |
| 48h | | 2.64±1.45 | 2.69±1.30 | -0.05 (-0.36~0.27) | 1.000 |

\*Comparison was determined by the Student’s t test followed by Bonferroni's correction. method. PGA = patient global assessment, EPA = early preoperative analgesia, POA = postoperative analgesia, SD = standard deviation, diff. = difference, CI = confidence interval.

**Supplementary table 9.** Comparison of consumption of pethidine, Knee ROM, IKDC score, and Lysholm score between two groups (Figure 4 and Figure 5)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Times points | EPA group (N=148), mean±SD | | POA group (N=148), mean±SD | Mean diff. (95% CI) | *P* value\* |
| Consumption of pethidine | | 22.97±18.33 | 27.70±19.15 | -4.73 (-9.02~-0.44) | 0.031 |
| Knee ROM | | 129.99±11.80 | 127.87±12.54 | 2.12 (-0.66~4.91) | 0.135 |
| IKDC score | | 77.03±7.76 | 76.63±7.84 | 0.41 (-1.38~2.19) | 0.655 |
| Lysholm score | | 86.89±6.83 | 87.88±6.97 | -0.99 (-2.57~0.58) | 0.216 |

\*Comparison was determined by the Student’s t test. method. PGA = patient global assessment, EPA = early preoperative analgesia, POA = postoperative analgesia, SD = standard deviation, diff. = difference, CI = confidence interval.