

**Table 1. Baseline characteristics of the study population**

| <b>Variables</b>                           | <b>ESPB (n=33)</b> | <b>TPVB (n=33)</b> | <b>P-value</b> |
|--------------------------------------------|--------------------|--------------------|----------------|
| <b>Demographics</b>                        |                    |                    |                |
| Age, years                                 | 59.3 ± 10.8        | 62.0 ± 9.9         | 0.283          |
| Male, n (%)                                | 13 (39.4)          | 14 (42.4)          | 1.000          |
| Height, cm                                 | 159 (153-163)      | 156 (150-163)      | 0.566          |
| Weight, kg                                 | 59.0 ± 8.9         | 55.2 ± 7.5         | 0.069          |
| Body mass index, kg/m <sup>2</sup>         | 23.4 (20.5-25.2)   | 22.4 (20.0-22.9)   | 0.127          |
| <b>Comorbidities</b>                       |                    |                    |                |
| Hypertension, n (%)                        | 15 (45.5)          | 15 (45.5)          | 1.000          |
| Chronic cardiac disease, n (%)             | 2 (6.1)            | 4 (12.1)           | 0.672          |
| Type 2 diabetes, n (%)                     | 4 (12.1)           | 4 (12.1)           | 1.000          |
| Pulmonary tuberculosis, n (%)              | 2 (6.1)            | 3 (9.1)            | 1.000          |
| COPD, n (%)                                | 2 (6.1)            | 1 (3.0)            | 1.000          |
| Asthma, n (%)                              | 0 (0.0)            | 3 (9.1)            | 0.238          |
| Thyroid disease, n (%)                     | 3 (9.1)            | 6 (18.2)           | 0.475          |
| Confirmed lung cancer <sup>†</sup> , n (%) | 20 (60.6)          | 23 (69.7)          | 0.605          |
| Physical status, n (%)                     |                    |                    | 0.680          |
| - ASA-I                                    | 6 (18.2)           | 6 (18.2)           |                |
| - ASA-II                                   | 20 (60.6)          | 17 (51.5)          |                |
| - ASA-III                                  | 7 (21.2)           | 10 (30.3)          |                |

*Bold text denotes column headers and section headings for groups of related variables. All values shown are mean (SD) or n (%) as appropriate. <sup>†</sup>Other indications included pulmonary sequestration and airway foreign body. In patients with suspected lung cancer, intraoperative frozen-section biopsy was performed, and lobectomy was carried out only when malignancy was confirmed. **Abbreviations:** ASA, American Society of Anesthesiologists; COPD: chronic obstructive pulmonary disease; ESPB, erector spinae plane block; TPVB, thoracic paravertebral block.*

**Table 2. Anesthesia and surgical characteristics of the study population**

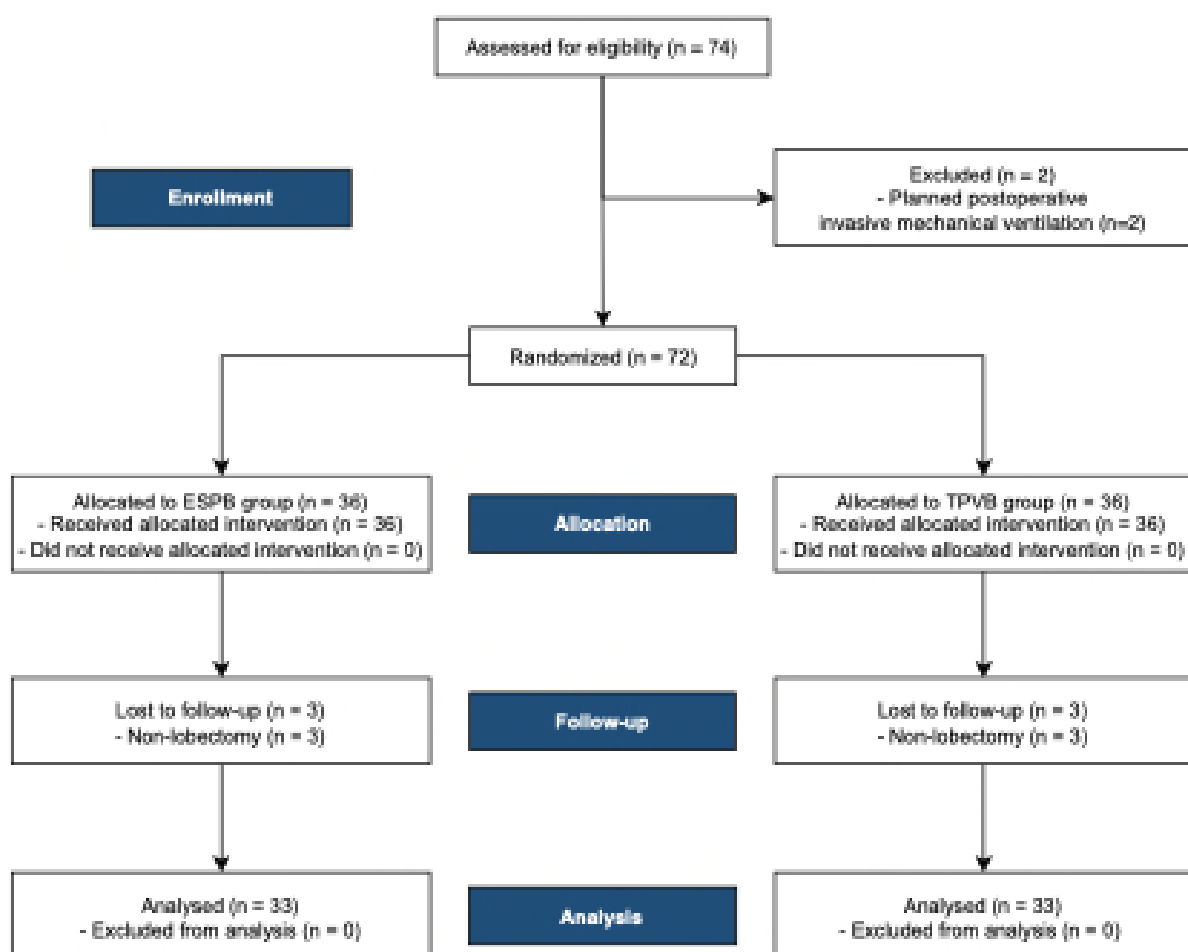
| <b>Variables</b>                      | <b>ESPB (n=33)</b> | <b>TPVB (n=33)</b> | <b>P-value</b> |
|---------------------------------------|--------------------|--------------------|----------------|
| <b>Surgery</b>                        |                    |                    |                |
| Duration of surgery, min              | 195 (178-244)      | 196 (178-240)      | 0.564          |
| Lobectomy site, n (%)                 |                    |                    | 0.387          |
| - Left upper lobe                     | 6 (18.2)           | 5 (15.2)           |                |
| - Left lower lobe                     | 7 (21.2)           | 2 (6.1)            |                |
| - Right upper lobe                    | 10 (30.3)          | 12 (36.4)          |                |
| - Right middle lobe                   | 5 (15.2)           | 5 (15.2)           |                |
| - Right lower lobe                    | 5 (15.2)           | 9 (27.3)           |                |
| Lymph node dissection, n (%)          | 25 (75.8)          | 28 (84.8)          | 0.536          |
| VATS convert to thoracotomy, n (%)    | 9 (27.3)           | 8 (24.2)           | 1.000          |
| <b>Regional anesthesia block</b>      |                    |                    |                |
| Duration of block performance, min    | 8 (7-10)           | 8 (7-10)           | 0.922          |
| <b>General anesthesia induction</b>   |                    |                    |                |
| Fentanyl use, µg/kg                   | 2.4 ± 0.6          | 2.6 ± 0.7          | 0.223          |
| Propofol use, mg/kg                   | 2.4 ± 0.7          | 2.6 ± 0.6          | 0.255          |
| Rocuronium use, mg/kg                 | 0.9 (0.8-1.0)      | 0.9 (0.8-1.0)      | 0.667          |
| <b>General anesthesia maintenance</b> |                    |                    |                |
| Fentanyl use, µg/kg                   | 1.0 (0.8-2.2)      | 1.1 (0.9-2.4)      | 0.551          |
| Opioid-free use, n (%)                | 5 (15.2)           | 3 (9.1)            | 0.708          |
| Rocuronium use, mg/kg                 | 0.7 ± 0.5          | 0.7 ± 0.4          | 0.908          |
| <b>General anesthesia summary</b>     |                    |                    |                |
| Fentanyl use, µg/kg                   | 3.9 ± 1.2          | 4.1 ± 1.0          | 0.409          |
| Propofol use, mg/kg                   | 3.0 (2.5-4.2)      | 3.0 (2.7-4.2)      | 0.681          |
| Rocuronium use, mg/kg                 | 1.5 (1.2-1.9)      | 1.6 (1.3-1.8)      | 0.719          |
| Duration of general anesthesia, min   | 306.0 ± 60.6       | 304.1 ± 51.3       | 0.891          |

*Bold text denotes column headers and section headings for groups of related variables. All values shown are mean (SD), median (IQR), or n (%) as appropriate. **Abbreviations:** ESPB, erector spinae plane block; TPVB, thoracic paravertebral block; VATS, video-assisted thoracic surgery.*

**Table 3. Opioid- and block-related adverse outcomes between groups.**

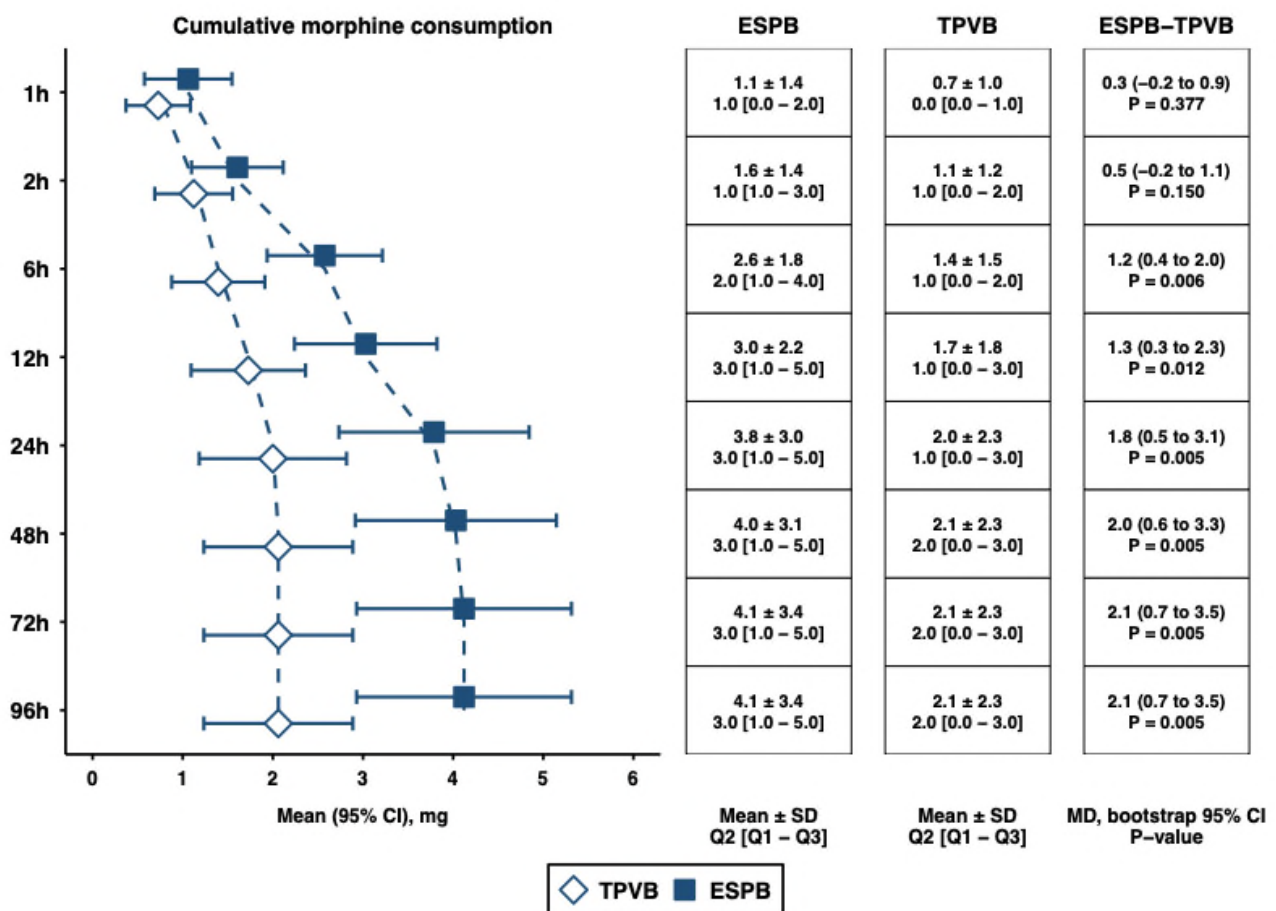
| <b>Variables</b>                           | <b>ESPB (n = 33)</b> | <b>TPVB (n = 33)</b> | <b>P value</b> |
|--------------------------------------------|----------------------|----------------------|----------------|
| <b>Opioid-related adverse outcomes</b>     |                      |                      |                |
| Nausea or vomiting, n (%)                  | 3 (9.1)              | 2 (6.1)              | 1.000          |
| Oversedation, n (%)                        | 0 (0.0)              | 0 (0.0)              | NA             |
| Respiratory failure, n (%)                 | 0 (0.0)              | 0 (0.0)              | NA             |
| <b>Block-related adverse outcomes</b>      |                      |                      |                |
| Primary block failure, n (%)               | 0 (0.0)              | 0 (0.0)              | NA             |
| Hypotension, n (%)                         | 3 (9.1)              | 2 (6.1)              | 1.000          |
| Vascular puncture <sup>†</sup> , n (%)     | 0 (0.0)              | 4 (12.1)             | 0.114          |
| Hematoma, n (%)                            | 0 (0.0)              | 0 (0.0)              | NA             |
| Pleural puncture, n (%)                    | 0 (0.0)              | 0 (0.0)              | NA             |
| Pneumothorax, n (%)                        | 0 (0.0)              | 0 (0.0)              | NA             |
| LAST, n (%)                                | 0 (0.0)              | 0 (0.0)              | NA             |
| Catheter dislodgement <sup>‡</sup> , n (%) | 0 (0.0)              | 1 (3.0)              | 1.000          |
| Catheter occlusion, n (%)                  | 0 (0.0)              | 0 (0.0)              | NA             |
| Catheter infection, n (%)                  | 0 (0.0)              | 0 (0.0)              | NA             |

*Bold text denotes column headers and section headings for groups of related variables. All values are n (%). <sup>†</sup>Risk difference was calculated as TPVB minus ESPB. The 95% confidence interval for the risk difference was estimated using the Newcombe-Wilson method without continuity correction: Risk difference: 12.1% (95% CI -0.6 to 27.3); P = 0.114. <sup>‡</sup>Catheter dislodgement occurred in one patient in the TPVB group at 62 hours postoperatively. **Abbreviations:** ESPB, erector spinae plane block; LAST, local anesthetic systemic toxicity; NA, not available; TPVB, thoracic paravertebral block.*

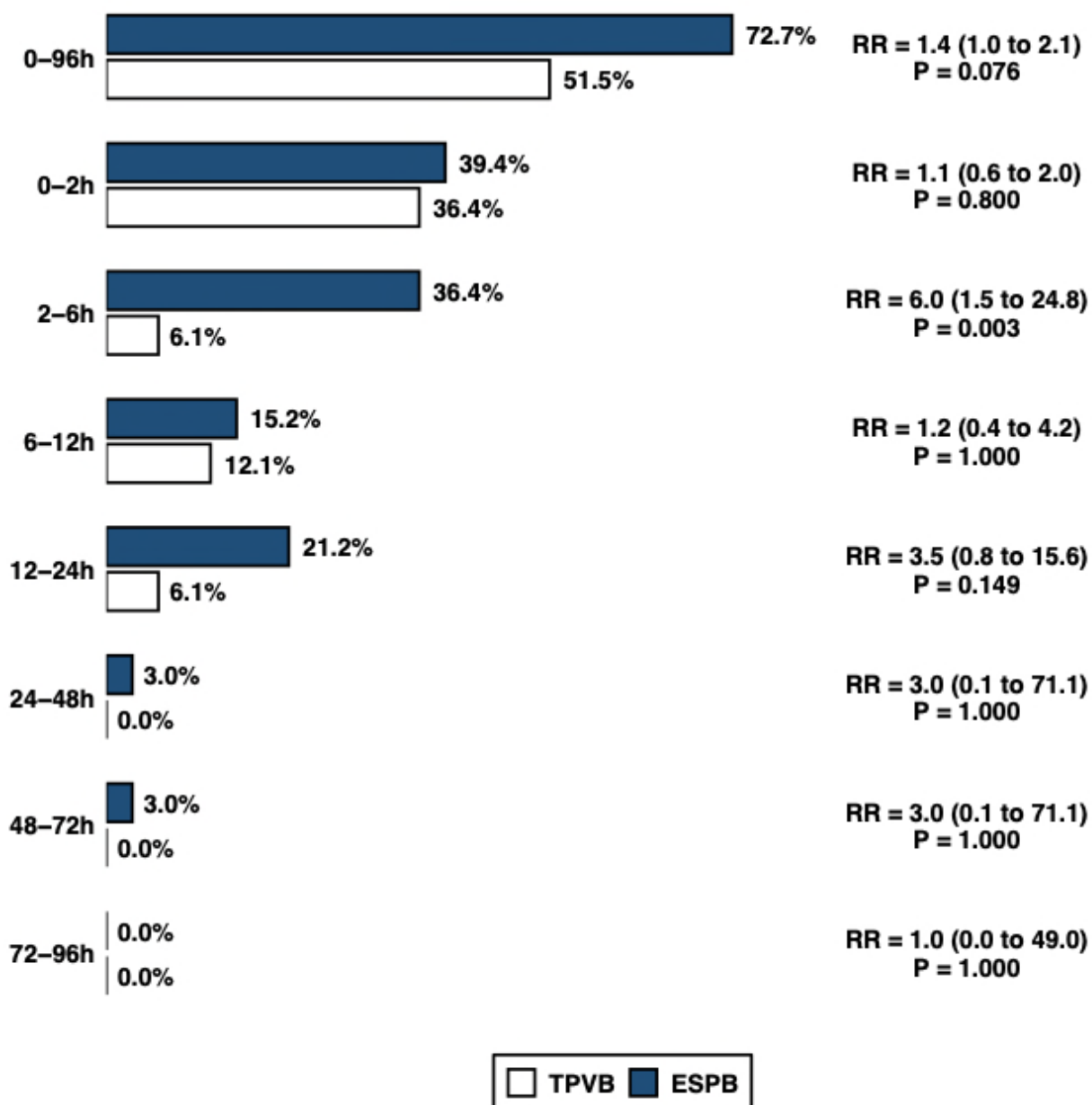


**Figure 1. Consolidated Standards of Reporting Trials (CONSORT) flowchart.** Of 72 randomized patients, six were excluded because intraoperative frozen-section pathology led to a change in the planned procedure and lobectomy was not performed. No patient was excluded because of treatment crossover, loss to follow-up, or a major protocol deviation. The modified intention-to-treat and per-protocol populations were therefore identical.

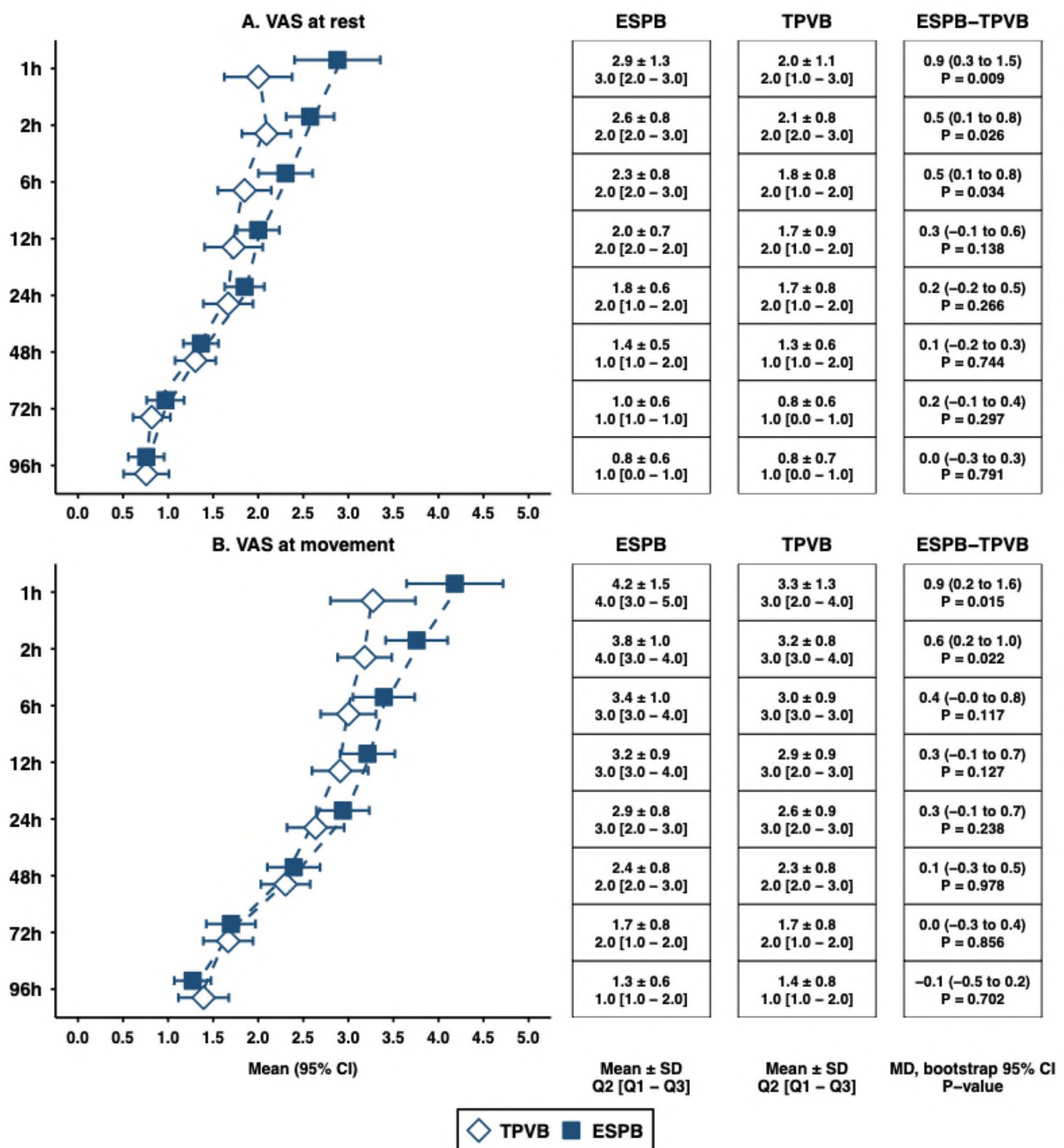
**Abbreviations:** *ESPB*, erector spinae plane block; *TPVB*, thoracic paravertebral block.



**Figure 2. Cumulative mean morphine consumption over time in the two groups.** Data are shown as mean values with 95% confidence intervals. Mean differences were calculated as ESPB minus TPVB, and 95% confidence intervals were estimated using non-parametric bootstrap resampling with 10,000 replications. Non-inferiority was assessed against the prespecified 10-mg margin. **Abbreviations:** CI, confidence interval; ESPB, erector spinae plane block; MD, mean difference; Q1, first quartile (25th percentile); Q2, median (50th percentile); Q3, third quartile (75th percentile); SD, standard deviation; TPVB, thoracic paravertebral block



**Figure 3. Interval-specific proportion of patients requiring at least one rescue morphine bolus across postoperative time intervals.** Relative risks compare ESPB with TPVB within each interval. Analyses beyond 24 hours were exploratory and were used to describe the postoperative analgesic trajectory. **Abbreviations:** *ESPB*, erector spinae plane block; *RR*, relative risk; *TPVB*, thoracic paravertebral block.



**Figure 4.** The line chart illustrates the mean VAS pain scores at rest (panel A) and during coughing (panel B) in the ESPB and TPVB groups at different time points throughout the study. VAS was measured using a 0–10 cm scale, with 0 indicating no pain and 10 indicating the worst pain imaginable. Data are shown as mean values with 95% confidence intervals. Mean differences were calculated as ESPB minus TPVB, with 95%

confidence intervals estimated by non-parametric bootstrap resampling with 10,000 replications. **Abbreviations:** CI, confidence interval; ESPB, erector spinae plane block; MD, mean difference; Q1, first quartile (25th percentile); Q2, median (50th percentile); Q3, third quartile (75th percentile); SD, standard deviation; TPVB, thoracic paravertebral block; VAS, visual analog scale.