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Assessment of Surgical Aggression in Simultaneous Operations Based on Neurohumoral Markers of Operative Stress

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Relevance of the Topic. In modern surgery, the frequency of simultaneous operations is steadily increasing, especially in patients with combined abdominal pathologies. However, the cumulative physiological burden of multiple procedures performed during a single surgical session raises concerns regarding the level of surgical aggression and its systemic impact. Evaluating the degree of surgical trauma not only through clinical parameters but also via neurohumoral markers of operative stress—such as cortisol, catecholamines, and cytokines—offers a more precise understanding of the body's response to various surgical techniques. This approach is essential for optimizing operative strategies, minimizing complications, and improving recovery outcomes in patients undergoing simultaneous surgeries.

Materials and Methods. The study was conducted on 98 patients who underwent simultaneous abdominal surgical interventions between 2021 and 2024. All patients were divided into two groups: the main group (n=50) underwent surgeries using minimally invasive (laparoscopic or endovideoscopic) techniques, while the comparison group (n=48) underwent traditional open surgical procedures. To assess the degree of surgical aggression, neurohumoral markers of operative stress—including serum cortisol, adrenaline, noradrenaline, and interleukin-6—were measured at three time points: preoperatively, intraoperatively, and 24 hours postoperatively. The dynamics of these markers were analyzed to evaluate the physiological stress response depending on the surgical technique applied.

Results and Discussion. The analysis revealed that patients in the main group, who underwent minimally invasive simultaneous surgeries, exhibited significantly lower levels of neurohumoral stress markers compared to those in the comparison group. Specifically, postoperative cortisol and interleukin-6 levels were on average 32.7% lower in the main group, indicating a reduced systemic stress response. Additionally, the intraoperative rise in catecholamines was less pronounced among patients receiving laparoscopic interventions, correlating with shorter recovery times and fewer postoperative complications. These findings suggest that minimally invasive techniques not only reduce the mechanical trauma of surgery but also mitigate the neurohumoral burden, making them a preferred option for simultaneous surgical treatment when feasible.

Conclusion. The study demonstrated that the degree of surgical aggression during simultaneous operations is significantly influenced by the technique of intervention. Minimally invasive approaches, such as laparoscopic and endovideoscopic methods, are associated with a markedly

lower neurohumoral stress response compared to open surgery. This reduction in operative stress translates into improved early postoperative outcomes, faster recovery, and a decreased risk of complications. These results support the wider implementation of minimally invasive techniques in simultaneous surgical procedures to enhance patient safety and optimize clinical effectiveness.