

## Preventive Effect of Locoregional Analgesia Techniques on Chronic Post-Surgical Neuropathic Pain: A Prospective Randomized Study

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**Abstract :** Introduction: Post-surgical chronic pain (PSCP) is a pathological condition with a rather complex etiopathogenesis that extensively involves sensitization processes and neuronal damage. The neuropathic component of these pains is almost always present, with variable expression depending on the type of surgery. Objective: To assess the presumed beneficial effect of Regional Anesthesia-Analgesia Techniques (RAAT) on the development of post-surgical chronic neuropathic pain (PSCNP) in various surgical procedures. Patients and Methods: A comparative study involving 510 patients distributed across five surgical models (mastectomy, thoracotomy, hernioplasty, cholecystectomy, and major abdominal-pelvic surgery) and randomized into two groups: Group A (240) receiving conventional postoperative analgesia and Group B (270) receiving balanced analgesia, including the implementation of a Regional Anesthesia-Analgesia Technique (RAAT). These patients were longitudinally followed over a 6-month period, with post-surgical chronic neuropathic pain (PSCNP) defined by a Neuropathic Pain Score DN2 $\geq$  3. Comparative measurements through univariate and multivariate analyses were performed to identify associations between the development of PSCNP and certain predictive factors, including the presumed preventive impact (protective effect) of RAAT. Results: At the 6th month post-surgery, 419 patients were analyzed (Group A= 196 and Group B= 223). The incidence of PSCNP was 32.2% (n=135). Among these patients with chronic pain, the prevalence of neuropathic pain was 37.8% (95% CI: [29.6; 46.5]), with n=51/135. It was significantly lower in Group B compared to Group A, with respective percentages of 31.4% vs. 48.8% (p-value = 0.035). The most significant differences were observed in breast and thoracopulmonary surgeries. In a multiple regression analysis, two predictors of PSCNP were identified: the presence of preoperative pain at the surgical site as a risk factor (OR: 3.198; 95% CI [1.326; 7.714]) and RAAT as a protective factor (OR: 0.408; 95% CI [0.173; 0.961]). Conclusion: The neuropathic component of PSCNP can be observed in different types of surgeries. Regional analgesia included in a multimodal approach to postoperative pain management has proven to be effective for acute pain and seems to have a preventive impact on the development of PSCNP and its neuropathic nature or component, particularly in surgeries that are more prone to chronicization.

**Keywords :** chronic postsurgical pain, postsurgical chronic neuropathic pain, regional anesthesia and analgesia techniques (RAAT), neuropathic pain score dn2, preventive impact

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