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Safety of the immediate use of nonsteroidal anti-inflammatory drugs after adult craniotomy for tumor

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Abstract

Objective: Poor pain control has a negative impact on postoperative recovery and patient satisfaction. However, overzealous pain management, particularly with opioids, can confound serial neurological assessments, increase morbidity, and predispose patients to long-term dependence. Nonsteroidal anti-inflammatory drugs (NSAIDs) are effective in treating postoperative pain and can limit opioid intake, but their use has been limited in patients undergoing craniotomy for brain tumor resection due to concerns of an increased hemorrhage risk. Herein, the authors aim to 1) address the safety of NSAID use in the immediate postoperative setting and 2) determine whether NSAID administration decreases opioid use following craniotomy for tumor resection in adult patients.

Methods: The authors conducted a retrospective cohort study of patients 18 years and older with an estimated glomerular filtration rate ≥ 60 ml/min/body surface area who had undergone craniotomy for tumor resection at their institution between 2019 and 2021. NSAID use in the first 48 hours following surgery was recorded. Primary outcomes were postoperative hemorrhage requiring a return to the operating room before hospital discharge and within 30 days of surgery. Secondary outcomes were more-than-minimal hemorrhage that did not require reoperation, acute kidney injury, and total opioid use within 48 hours after craniotomy.

Results: Among 1765 reviewed patient records, 1182 were eligible for inclusion in this analysis. Amid these records were 114 patients (9.6%) who had received at least one dose of an NSAID within 48 hours of their craniotomy. Four (0.3%) patients experienced bleeding requiring a return to operating room, one of whom was from the NSAID-treated group (RR 3.12, 95% CI 0.33-29.77, $p = 0.30$). No significant difference in nonoperative intracranial hemorrhage (RR 1.34, 95% CI 0.54-3.35, $p = 0.53$), postoperative acute kidney injury, or clinically significant extracranial bleeding was found between the NSAID and no-NSAID groups. Patients in the NSAID group had significantly higher oral morphine equivalent use (median 68 vs 30, $p < 0.001$).

Conclusions: Postoperative NSAID use following craniotomy for tumor resection was not associated with an increased risk of hemorrhage requiring a return to the operating room. The authors noted higher opioid use in the patients treated with NSAIDs, which may reflect underlying reasons for the decision to treat patients with NSAIDs in the immediate postoperative period. These data warrant further investigation of NSAIDs as a safe, opioid-sparing postoperative pain management strategy in patients with normal kidney function who are undergoing intracranial tumor resection.

Keywords: Toradol; craniotomy; nonsteroidal anti-inflammatory; pain; postoperative hemorrhage; tumor.

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