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Title: Time Matters: A Retrospective Analysis of Perioperative Outcomes in Cranial Mass Surgeries Performed During and Outside Working Hours.
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Abstract: Objective: Cranial masses are lesions arising from intracranial structures such as the brain parenchyma, meninges, or cranial bones, and may present as either benign or malignant tumors. These lesions can occur across all age groups due to diverse etiologies and typically manifest with a wide range of clinical symptoms. The primary treatment is usually gross total resection, with anesthetic management playing a critical role in ensuring patient safety and optimizing surgical outcomes. Depending on the patient's clinical status, these procedures may be performed during or outside regular working hours. This study aims to evaluate the impact of surgical timing on anesthetic and perioperative outcomes in cranial mass surgeries by comparing procedures conducted during and outside regular working hours. Methods: Following ethics committee approval, this retrospective, observational, and comparative study was conducted by reviewing the anesthesia records of patients who underwent cranial mass surgery under general anesthesia between January and June 2024 at our institution. Patients were categorized into two groups based on the timing of their surgery: during regular working hours and outside regular hours. Parameters assessed included markers of systemic inflammation (Neutrophil-to-Lymphocyte Ratio [NLR], Platelet-to-Lymphocyte Ratio [PLR], and Systemic Immune-Inflammation Index [SII]), intraoperative inotrope and vasopressor requirements, estimated blood loss and transfusion needs, intraoperative complication rates, postoperative renal function, in-hospital mortality, and length of hospital stay. Results: Of the 2.325 patient records reviewed, 289 with complete perioperative data were included in the final analysis. Mortality among patients operated on outside regular working hours was 2.3 times higher than those treated during regular hours. Inflammatory markers (NLR, PLR and SII) were significantly elevated in the after-hours group ($p< 0.001$). Interestingly, anesthesia duration was significantly longer in procedures performed during regular

hours (p< 0.001). Conclusion: Our findings suggest that cranial surgeries performed outside regular working hours are associated with heightened systemic inflammatory responses and increased mortality rates. These results highlight the importance of more comprehensive perioperative management and intensified postoperative monitoring in after-hours cases. When feasible, optimizing surgical scheduling may contribute to improved clinical outcomes in patients undergoing cranial mass resection.

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