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# Association between Postoperative Decrease of Albumin and Outcomes in Patients Undergoing Craniotomy for Brain Tumors

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## Abstract

**Background:** Serum albumin reflects nutritional status and is associated with postoperative complications and mortality. Delta albumin ( $\Delta$ Alb), defined as the difference between preoperative and lowest postoperative levels, could predict complications and mortality, even with post-op levels above 30 g/L prompting albumin infusions. This study aimed to assess how  $\Delta$ Alb relates to outcomes in craniotomy patients with brain tumors.

**Methods:** This retrospective study screened patients diagnosed with a brain tumor who underwent cerebral surgery from a single Chinese hospital between December 2010 and April 2021. Patients were divided into four groups based on their  $\Delta$ Alb levels: <5 g/L (normal), 5-9.9 g/L (mild  $\Delta$ Alb), 10-14.9 g/L (moderate  $\Delta$ Alb), and  $\geq$ 15 g/L (severe  $\Delta$ Alb). The primary outcome was postoperative 30-day mortality.

**Results:** Among the 9660 patients undergoing craniotomy for brain tumors, the median  $\Delta$ Alb level after craniotomy was 7.3 g/L.  $\Delta$ Alb was associated with increased postoperative 30-day mortality; Odds ratios (OR) for mild, moderate, and severe  $\Delta$ Alb were 1.93(95% CI, 1.17-3.18,  $P=0.01$ ), 2.21(95% CI, 1.28-3.79,  $P=0.004$ ), and 7.26(95% CI, 4.19-12.58,  $P<0.01$ ), respectively. Significantly,  $\Delta$ Alb >5g/L was found to have a strong association with a higher risk of mortality, even when the nadir Alb remained greater than 30 g/L (OR, 1.84; 95% CI, 1.13- 3.00,  $P=0.014$ ).

**Conclusions:** Among patients undergoing craniotomy for brain tumor resection, a mild degree of  $\Delta$ Alb was associated with increased 30-day mortality, even if the nadir Alb remained greater than 30 g/L. Moreover,  $\Delta$ Alb was associated with postoperative complications and longer lengths of stay.

**Keywords:** Brain Tumor; Craniotomy; Delta Albumin; Mortality; Postoperation.

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