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Resumo	<p>Tibial diaphysis fractures are common injuries resulting from high-to-low-energy traumas in patients of all age groups, but few reports currently provide complementary parameters for the assessment of bone healing processes in the postoperative period. Serum alkaline phosphatase (ALP) and the scores from the Radiographic Union Scale for Tibial Fractures (RUST) can promote new horizons in this context. Therefore, the aim of this study was to assess the behavior of ALP and RUST through within-subject comparisons from immediately post-surgery to 49 days after tibial diaphysis fracture repair. This article included four case studies where patients underwent the same procedures. Adults of both sexes aged 18 to 60 years with tibial fractures requiring surgery were included. After surgical intervention (T1), the patients were followed for 49 days after surgery, returning for follow-up appointments on the 21st (T2) and 49th (T3) days. At the follow-up appointments, new X-ray images were obtained, and blood samples were collected for ALP measurement. Serum ALP levels increased by T2 following tibial reamed intramedullary nailing surgery. While this increase persisted into T3 for two patients, a decline was observed during the same period for the other two patients. Both events are indicative of the bone consolidation process, and RUST scores at T3 corroborate this perspective for all patients included in this study. Considering that delta ALP (T3-T1 value) was lower in patients who exhibited the highest RUST score, we suggest that a synchronized analysis between ALP and RUST allows medics to diagnose bone consolidation. Therefore, it can be concluded that the analysis of ALP alongside RUST may be complementary for evaluating bone consolidation following tibial reamed intramedullary nailing surgery, but future studies are needed to confirm this assertion</p>
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