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LEUKOCYTE AND PLATELET-RICH FIBRIN IN ORO-DENTAL AND MAXILLO-FACIAL SURGERY: CURRENT EVIDENCE FROM RANDOMIZED CONTROLLED CLINICAL TRIALS

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Background: Despite significant improvements in reconstruction techniques and materials during the last decades, the regeneration, restoration and/or repair of oro-dental and maxillo-facial defect remains a challenge. Platelet concentrates are autologous blood extracts obtained through centrifugation of whole blood samples. The preparation procedure allows the gathering and concentration of platelets and other therapeutic blood constituents (fibrinogen/fibrin, growth factors, leukocytes and circulating cells), in clinically-usable preparations (surgical adjuvants), which may enhance, accelerate and promote tissue (hard and soft) wound healing and regeneration. Despite promising clinical observations, their overall effectiveness remains debated, to date. This is mainly due to mixed/variable clinical outcomes, limited high-quality evidence-based literature, and poor characterization of end-products (and preparation protocols) used in studies; also until recently, lack of proper terminology systems to classify these preparations. Today, the leukocyte and platelet-rich fibrin (L-PRF) sub-family is receiving the utmost attention, mainly due to simplicity, user-friendliness, malleability and potential cost-effectiveness, when compared to the PRPs.

Objectives & Methodology: L-PRF is a second generation 3D autogenous/autologous platelet concentrate (and biomaterial: slowly- and strongly-polymerized fibrin gel; rich in growth factors and lymphocytes) derived via simple and rapid centrifugation of whole venous blood, in the absence of anti-coagulants, bovine thrombin, additives or any gelifying agents. A relatively new "revolutionary" step in modern platelet concentrate-based therapeutics, clinical effectiveness of L-PRF remains highly-debatable, whether due to preparation protocol variability, limited evidence-based scientific and clinical literature and/or inadequate understanding of its bio-components. This critical review provides an update on the application and clinical potential/effectiveness of L-PRF during oral surgery procedures, limited to evidence obtained from human randomized and controlled clinical trials (RCTs: Jan. 2015–Nov. 2017).

Conclusions: Autologous L-PRF is often associated with early bone formation and maturation; accelerated soft-tissue healing; and reduced post-surgical pain, oedema and discomfort. Preparation protocols require revision and standardization. Well-designed RCTs (according to the CONSORT statement) are also needed for validation. Furthermore, a better analysis of rheological properties, bio-components and bioactive function of L-PRF preparations would enhance the cogency, comprehension and therapeutic potential of the reported findings or observations, moving a step closer towards a new era of "super" oro-dental and maxilla-facial bio-materials/-scaffolds; an ongoing topic of vital investigation at our BioMAT'X research group in Santiago de Chile.

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