TABLE 2. Direct clinical comparison of platelet-rich plasma (PRP) and platelet-rich fibrin (PRF) in oral and maxillofacial regenerative surgery.

Domain	Platelet-rich plasma (PRP)	Platelet-rich fibrin (PRF)	Clinical interpretation / evidence limitation
Preparation principle	Platelet-enriched plasma obtained after blood collection and centrifugation; preparation commonly involves anticoagulation and may include one- or two-step processing	Blood is centrifuged without anticoagulants, allowing formation of a fibrin matrix containing platelets and leukocytes [8,9,11]	Preparation protocols vary substantially among platelet concentrates, limiting direct comparison across studies [8,9,11]
Biological architecture	Predominantly a platelet-enriched plasma fraction that delivers platelet-derived mediators	Three-dimensional fibrin matrix that entraps platelets and leukocytes and provides a biologically active scaffold [8,9,12]	The structural distinction may influence retention and release kinetics, but biological differences should not automatically be interpreted as clinical superiority
Growth-factor release	Relatively rapid release of platelet-derived mediators following activation	Fibrin matrix provides a more sustained release environment for platelet-derived mediators [8,9,12]	Sustained release is a proposed biological advantage of PRF, although its clinical significance remains indication-dependent
Handling and surgical application	Can be applied as a liquid preparation or after activation and may be incorporated into grafting or regenerative procedures	Forms a fibrin clot or membrane that can be manipulated and adapted to the surgical site [8,9,10,13]	PRF may provide practical advantages where a membrane or stable fibrin matrix is desirable, whereas PRP may be advantageous where a liquid preparation is required
Soft-tissue healing	Platelet concentrates may support soft-tissue repair through delivery of platelet-derived mediators	Systematic evidence supports beneficial effects of PRF on soft-tissue wound healing [8,9]	Evidence is stronger for healing-related outcomes than for predictable hard-tissue regeneration
Postoperative pain and morbidity	May be used as a biological adjunct in selected surgical procedures	Clinical evidence supports reductions in postoperative morbidity in selected oral surgical procedures [13,14]	Magnitude of benefit depends on procedure, protocol, and outcome definition; evidence should not be generalised across all indications
Bone regeneration / ridge preservation	May be used as an adjunct to graft-based regenerative procedures	PRF has been investigated extensively for ridge preservation and bone-healing applications [10,12,14,18,19]	Recent systematic reviews support potential benefit in selected ridge-preservation outcomes, but PRF should not be considered a predictable replacement for bone grafting [18,19]
Periodontal regeneration	Platelet-based concentrates may be incorporated as adjuncts to periodontal regenerative procedures	PRF has demonstrated regenerative potential in periodontal applications [9,10,13]	Clinical outcomes remain heterogeneous and are influenced by defect characteristics, preparation protocol, and concomitant regenerative treatment
Fibrin matrix formation	Does not primarily rely on formation of a dense autologous fibrin scaffold	Formation of an endogenous fibrin matrix is a defining characteristic of PRF [8,9,11]	Fibrin architecture represents one of the principal biological differences between PRP and PRF
Need for exogenous anticoagulant	Commonly used during PRP preparation	Not required for conventional PRF preparation [11]	Avoidance of anticoagulants permits endogenous fibrin polymerisation during PRF preparation
Protocol standardisation	Considerable variation in platelet concentration, leukocyte content, activation methods, and centrifugation protocols	Also substantial variation among PRF formulations, centrifugation protocols, and preparation systems [11,13]	Protocol heterogeneity is a major limitation when comparing platelet-concentrate studies and interpreting pooled clinical evidence
Overall clinical position	Platelet-concentrate adjunct with potential application in selected regenerative and healing procedures	Clinically integrated adjunct with the strongest evidence in selected healing, periodontal, and ridge-preservation applications [8,10,13,14,18,19]	Neither PRP nor PRF should currently be regarded as a universal substitute for established grafting or reconstructive procedures

Abbreviations: PRP = platelet-rich plasma; PRF = platelet-rich fibrin.