EDITORIAL

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Use of platelet-rich fibrin and natural bone regeneration in regenerative surgery

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The preparation of platelet concentrates from platelet and autologous growth factors collected in plasma solutions have been utilized in regenerative surgery since platelet-rich plasma (PRP) was introduced in the late 1990s[1]. This product has been widely studied, with PRP having a positive effect on the wound healing process and tissue regeneration. Despite this, several factors have been shown to limit the usefulness of PRP. The effect of PRP was limited to the early phases of healing only and did not influence long-term remodeling[2]. Other studies have also shown that the effects of PRP on bone regeneration do not differ significantly from control groups[3]. The preparation of PRP requires additional use of bovine thrombin and calcium chloride in addition to coagulation factors that inhibit wound healing. Also, the fibrin network produced by PRP is delicate and not very well structured.

To address these limitations, a new preparation of platelet concentrates, platelet-rich fibrin (PRF), was developed by Dohan et al.[4] that contained platelets and leukocytes as well as a variety of growth factors and cytokines. This product is obtained through centrifugation without anticoagulants. This strong fibrin matrix facilitates continuous slow release of growth factors and cytokines over a period of 10 days[5]. The effects of PRF on tissue regeneration include angiogenic potential, immune system control, and the potential to recruit circulating stem cells. Furthermore, leukocytes like neutrophils and macrophages trapped within the fibrin matrix contribute the prevention of bacterial contamination within the wound[6]. For these reasons, PRF is attracting attention in regenerative surgery. The clinical use of PRF for bone grafting and implant-supported rehabilitation is currently widespread.

The concept of natural tissue (bone) regeneration (NT(B)R) using PRF membrane has been described previously[7,8]. NT(B)R refers to the use of PRF, especially L-PRF membranes during regeneration surgery for periodontal intrabony defects and has been presented an alternative technique to GT(B)R. L-PRF membranes improve soft tissue neoangiogenesis and wound closure, promote the regeneration of bone volume and gingiva, and function as a competitive barrier between bone and soft tissue. This concept may be successfully extended to many tissue defects and peri-implant bony defects. However, the effects of PRF remain unclear. Future validation studies and clinical results are needed that will better characterize the regenerative effects of PRF for various regenerative surgeries.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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