

Current Applications of Platelet Gels in Facial Plastic Surgery

Sumeet Bhanot, M.D.,¹ and James C. Alex, M.D.¹

ABSTRACT

The response of living tissue to injury is a central component in the planning of all surgical procedures. The wound-healing process is typically divided into three phases (inflammatory, proliferative, and remodeling) and is a complex process in which a multitude of cellular and humoral components interact to restore a wound defect. Platelets and their released cytokines and growth factors are pivotal in the modulation of this entire process. Although several techniques may be used to achieve hemostasis after initial injury, few initiate and actually accelerate tissue regeneration. Both platelet gel and fibrin glue are effective hemostatic agents. Platelet gels, unlike fibrin glue, have a high concentration of platelets that release the bioactive proteins and growth factors necessary to initiate and accelerate tissue repair and regeneration. In particular, two growth factors that play a major role in platelet gels are platelet-derived growth factor, a powerful chemoattractant, and transforming growth factor β , which significantly increases and stimulates the deposition of extracellular matrix. In creating a platelet gel, autologous blood is centrifuged to produce a concentrate high in both platelets and plasma. This concentrate can be applied to wounds, providing hemostasis, adhesion, and enhanced wound healing. Recent techniques for the autologous concentrating process have been streamlined, and now platelet gels are clinically accessible to most physicians. Platelet gels have global applications in surgery and are especially useful for the soft tissue and bony reconstructions encountered in facial plastic and reconstructive surgery. In these applications, their use has been associated with a decrease in operative time, necessity for drains and pressure dressings, and incidence of complications. When applied to bony reconstruction it provides adhesion for the consolidation of cancellous bone and comminuted fracture segments.

KEYWORDS: Blood products, platelet gels, tissue sealants, fibrin glue