THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
August, 2022; 2(8), 1493-1494

Success Story

Soft tissue wound management using Platelets rich plasma

Dr. Ajeet Kumar[1] Dr. Gyan Dev Singh[2] and Dr. Ramesh Tiwary[3]
[1]Assistant professor Department of Biochemistry, Bihar Veterinary College, Patna
[2]Assistant professor Department of Veterinary Clinical Complex, Bihar Veterinary College, Patna
[3]Assistant professor Department of Veterinary Surgery and radiology, Bihar Veterinary College, Patna
https://doi.org/10.5281/zenodo.7037333

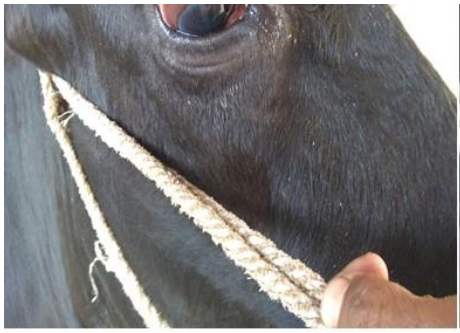
Platelet-rich plasma (PRP) is defined as a portion of the plasma fraction of autologous blood having a platelet concentration above baseline. PRP has received significant homage and growing attention in the fields of tissue engineering, wound healing, bone grafting, trauma surgery, and angiogenesis. PRP is an autologous concentration of platelets in concentrated plasma, which is extensively used to promote soft and hard tissue healing and to significantly reduce wound-healing time. The significance behind its use refers to the abundance of growth factors (GF) present in a well-prepared PRP concentrate. These GF enhance the quality of wound healing and reduce healing time by expediting tissue regeneration. GF are a form of biological mediators that have local and systemic effects. These factors are known to regulate cell migration, attachment, proliferation, differentiation, and promote extracellular matrix accumulation via binding to specific cell surface receptors. This receptor-ligand interaction has been identified as the underlying mechanism behind the regulatory process, which then triggers complex and specific molecular cascades. The presence of GF in high concentration in a PRP concentrate is directly responsible for increasing cell proliferation, higher collagen production, initiate angiogenesis, and inducing cell differentiation.

Concentration of platelets in PRP is approximately six times higher than platelets concentration in blood. Platelets release a large number of growth factors when they arrive at a site of tissue injury, which includes platelets include platelet-derived growth factor, transforming growth factor-β and clotting factor, platelet factor-4, interleukin-, platelet-derived angiogenesis factor, vascular endothelial growth factor, epidermal growth factor, epithelial cell growth factor, insulin like growth factor etc., which have both mitogenic and chemotactic properties. These growth factors aid healing by attracting un-differentiated cells in the newly formed matrix and triggering cell division. PRP decrease release of cytokine and also limit inflammation process. It interrelating through macrophages to promote tissue healing and regeneration. It promotes fresh capillary progression and hasten the epithelialization process in chronic wounds. Platelets in PRP also play a role in host defense mechanism at the wound site by producing signaling proteins that attract macrophages PRP also may contain a small number of leukocytes that synthesize interleukins as part of a non-specific immune response.

Use of antibiotic and anti-inflammatory for chronic wound is not very much effective but blood derived products are known to be very effective and safe options for chronic cases. This type of study is adequately convincing that use of platelet rich plasma is an efficacious medical treatment modality for chronic conjunctivitis.

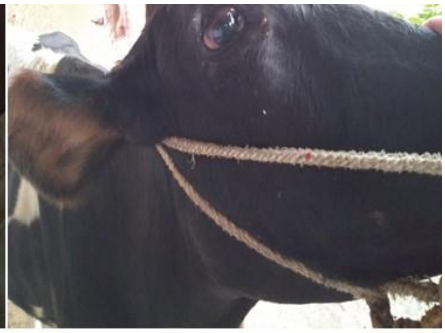
Wound healing cases of cattle, goat, dog and horses presented to veterinary clinical complex was treated with PRP.

PRP was prepared by double centrifugation method. Ten ml blood was collected in vial containing sodium citrate anticoagulant, 0.5 ml was kept for platelets count and immediately centrifuge at 3000 rpm for 15 min. Plasma along with buffy coat, platelets and superficial erythrocyte was transfer to another tube and again centrifuge at 3000 rpm for 15 min. Plasma containing buffy coat and platelets i.e., PRP was isolated in another tube. PRP was activated by adding 1 M calcium chloride. Before activation, platelets were also counted in PRP. The autologous platelet rich plasma was applied locally on wound surface. All animal recovered fully without using any antibiotic and analgesics.



Chronic conjunctivitis before application of PRP

Application of PRP



Conjunctiva after PRP treatment