

# Use of a Collagen-Platelet Rich Plasma Scaffold to Stimulate Healing of a Central Defect in the Canine ACL

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**ABSTRACT:** The anterior cruciate ligament (ACL) of the knee fails to heal after primary repair. Here we hypothesize that a beneficial biologic repair response can be induced by placing a collagen-platelet rich plasma (collagen-PRP) material into a central ACL defect. A collagen-PRP scaffold was used to treat a central ACL defect in vivo. In the first experiment, the histologic response in treated and untreated defects was evaluated at 3 ( $n=5$ ) and 6 weeks ( $n=5$ ). In the second experiment, biomechanical testing of the treated ligaments ( $n=8$ ) was performed at 6 weeks and compared with the results of biomechanical testing of untreated defects at the same time-point ( $n=6$ ). The percentage filling of the defects in the treated ACLs was significantly higher at both the 3- and 6-week time-points when compared with the untreated contralateral control defects ( $50 \pm 21\%$  vs.  $2 \pm 2\%$  at 3 weeks, and  $43 \pm 11\%$  vs.  $23 \pm 11$  at 6 weeks; all values mean  $\pm$  SEM. Biomechanically, the treated ACL defects had a 40% increase in strength at 6 weeks, which was significantly higher than the 14% increase in strength previously reported for untreated defects ( $p < 0.02$ ). Placement of a collagen-PRP bridging scaffold in a central ACL defect can stimulate healing of the ACL histologically and biomechanically. © 2006 Orthopaedic Research Society. Published by Wiley Periodicals, Inc. *J Orthop Res* 24:820–830, 2006

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