ISAKOS

International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine

10th Biennial ISAKOS Congress • June 7-11, 2015 • Lyon, France

Paper #20

Healing Disturbance with Suture Bridge Configuration Repair in Rabbit Rotator Cuff Tear

Sae Hoon Kim, MD, PhD, KOREA
Jangwoo Kim, MD, KOREA
Young Eun Choi, BS, KOREA
Hwa-Ryeong Lee, DPT, KOREA

Seoul National University Hospital
Seoul, KOREA

Summary:
Compression of the tendon in transosseous-equivalent repair with suture bridge configuration could hamper blood supply from the proximal tendon and affect the tendon-healing process

Abstract:
PURPOSE
Although transosseous equivalent with suture bridge configuration repair (SBCR) increases tendon contact pressure at the footprint, ischemia under the compression area is a concern. To verify the healing response of SBCR, this study compared parallel type transosseous repair (PTR) and SBCR through biomechanical and histologic analyses in rabbits at different time points.

METHODS
Acute rotator cuff repair was done to 32 rabbits. Both shoulders were repaired with either PTR or SBCR. In PTR, simple PTR was done through two parallel transosseous tunnels created with a micro drill. In SBCR, two additional crisscross transosseous tunnels were added and “M” configuration repair was done. Medial strands were not tied in SBCR. At 1, 2, and 5 weeks postoperatively, comparative biomechanical testing in 8 rabbits and histologic analysis in 4 rabbits were performed.

RESULTS
Failure loads at 1 week (38.12 ± 20.43 N vs. 52.00 ± 27.23 N; P = 0.284) and 5 weeks (97.93 ± 48.35 N vs. 119.60 ± 60.81 N; P = 0.218) were not statistically different between the SBCR and PTR groups, respectively. However, it was significantly lower in the SBCR group than in the PTR group (23.56 ± 13.56 N vs. 44.25 ± 12.53 N; P = 0.009), respectively, at 2 weeks. In SBCR, medial row failure was more frequent than PTR at 2 weeks (6/8 vs. 1/8; P = 0.041). Fibrinoid deposition was markedly greater in SBCR than in PTR at 2 weeks. At 1 and 5 weeks, the amount of fibrinoid deposition was similar between the repair methods in the individual rabbits. For vascularization, no vessel was visible at 1 week. However, at 2 and 5 weeks, more vessels could be observed in PTR than in SBCR, Especially at 2 weeks in which no vessel was observed in all 4 SBCR specimens.

CONCLUSION
SBCR exhibited inferior biomechanical strength and histologic results than PTR at 2 weeks postoperative period. These results could be due to compression of the tendon in closed-circuit fashion hampering the blood supply from the proximal tendon.

CLINICAL RELEVANCE
Although SBCR increases contact pressure in rotator cuff repair, it could adversely affect tendon healing by causing ischemic area under compression.