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Title: Return to Sports and Work after Arthroscopic Superior Capsule Reconstruction in Patients with Irreparable Rotator Cuff Tears

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Objectives: Sports and work can be a causative factor in rotator cuff tears, so that these active patients expect to return to sports and work after surgery. However, in case of irreparable rotator cuff tears, it's not easy to return to sports and work. A new surgical treatment for irreparable rotator cuff tears, arthroscopic superior capsule reconstruction, restores shoulder stability and muscle balance in patients with irreparable rotator cuff tears; consequently, it improves shoulder function—specifically deltoid muscle function—and relieves pain. In this study, we evaluated the rate of return to sports and work in patients treated with arthroscopic superior capsule reconstruction.

Methods: From 2007 to 2014, we performed arthroscopic superior capsule reconstruction on 102 shoulders in 100 patients (mean age 66.7 years; range, 43 to 82) with irreparable rotator cuff tears that had failed conservative treatment. Twenty-six patients played sports before surgery (6 golf, 4 table tennis, 4 swimming, 3 martial arts, 2 baseball, 2 yoga, 1 tennis, 1 badminton, 1 skiing, 1 mountain-climbing, and 1 ground golf). Thirty-four patients had been employed before surgery (21 manual workers, 10 farmers, 1 butcher, 1 cook, and 1 athletic trainer). Also physical examination, radiography, and magnetic resonance imaging were performed before surgery; at 3, 6, and 12 months after surgery; and yearly thereafter. The return-to-sports and work rate and healing rate were analyzed. The American Shoulder and Elbow Surgeons (ASES) score, and active shoulder range of motion were compared between before surgery and at the final follow-up (mean, 48 months; range, 24 to 88 months) by using the t and chi-square tests. A significant difference was defined as $P < 0.05$.

Results: All 26 patients who had played sport before their injuries returned fully to their previous sports, although most of the patients had been playing at recreational level before their injuries. Thirty-two patients returned fully to their previous jobs, whereas two patients (1 farmer and 1 manual worker) returned with reduced hours and workloads. Ninety-five of 102 shoulders (93.1%) had no graft tear or no re-tear of the repaired rotator cuff tendon during the follow-up period. Three shoulders (2.9%) with severe fatty degeneration of the infraspinatus tendon had re-tear of the repaired infraspinatus tendon at 3 months after surgery. Four shoulders (3.9%) suffered a postoperative graft tear by 3 months (2 patients) or 1 year (2 patients) after surgery. The average preoperative American Shoulder and Elbow Surgeons (ASES) score was 31.6 points (range, 3.3 to 63.3 points). Average clinical outcome scores after arthroscopic superior capsule reconstruction all improved significantly at final follow-up (ASES, 93.3

points) ($P < .00001$). The shoulder active range of motion improved significantly after arthroscopic superior capsule reconstruction at the final follow-up: by 56.9° (92.4° to 149.3°) for elevation ($P < .001$), by 15.7° (26.0° to 41.6°) for external rotation ($P < .01$), and by three vertebral bodies (L4 to L1) for internal rotation ($P < .01$).

Conclusion: Arthroscopic superior capsule reconstruction restored shoulder function and resulted in high rates of return to recreational sport and work. These results suggest that arthroscopic superior capsule reconstruction is a viable surgical option for irreparable rotator cuff tears, especially in patients who work and enjoy sport.