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Prospective evaluation of postoperative compliance and outcomes after rotator cuff repair in patients with and without workers' compensation claims

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Background: This study prospectively evaluated compliance and outcomes after rotator cuff repair in patients with and without Workers' Compensation claims.

Materials and methods: From December 2007 to January 2010, 42 consecutive patients with Workers' Compensation claims (Work Comp group), and 50 consecutive patients without a Workers' Compensation claim (non-Work Comp group) underwent arthroscopic rotator cuff repair and were enrolled in this study. Compliance with a postoperative protocol of shoulder immobilization and physical therapy was documented. Patients were monitored clinically for a minimum of 12 months.

Results: Noncompliance with protocol was documented in 22 of 42 patients (52%) in the Work Comp group compared with 2 of 50 (4%) in the non-Work Comp group ($P < .001$). The Work Comp group had less improvement in preoperative to postoperative outcome scores for the American Shoulder and Elbow Surgeons (ASES) score (40.4 to 60.1), Simple Shoulder Test (SST) score (3.9 to 6.0) and visual analog scale (VAS) for pain (7.0 to 3.5) compared with the non-Work Comp group (ASES, 41.7 to 89.2; SST, 4.3 to 10.7; VAS, 6.2 to 0.35; $P < .0001$). The compliant Work Comp patients had more favorable results in final outcome scores (ASES, 73.1; SST, 7.9; VAS, 1.5) than noncompliant Work Comp patients (ASES, 48.4; SST, 4.3; VAS, 5.3; $P < .0001$).

Conclusions: Patients with Workers' Compensation claims demonstrated a high rate of postoperative noncompliance (52%) compared with patients without Workers' Compensation claims (4%) after rotator cuff repair. Those Workers' Compensation patients who had no evidence of noncompliance had significant improvements and more favorable outcomes than the noncompliant Workers' Compensation patients.

Level of evidence: Level II, Prospective Cohort Design, Treatment Study.

Keywords: Workers compensation; rotator cuff repair; arthroscopic; healing; range of motion

Several studies have identified Workers' Compensation claims as a predictor of poorer patient outcomes after rotator cuff repair.[5-8,13] Multiple factors, such as secondary gain, psychosocial issues, work demands, comorbidities, the Workers' Compensation claim itself, and smoking have been postulated to account for observed differences in outcomes between patients with and without Workers' Compensation claims.[5] To date, patient compliance with a postoperative protocol after rotator cuff repair has not been specifically analyzed as a potential confounding factor affecting Workers' Compensation patient outcomes after surgery.

The Western Investigational Review Board approved this study (protocol number 20111262).

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Our hypothesis was that patients with Workers' Compensation claims would be less likely to be compliant with shoulder immobilization and physical therapy exercises after arthroscopic rotator cuff repair compared with patients without Workers' Compensation claims. We hypothesized that this lack of compliance may be a factor that affects Workers' Compensation patient outcomes. The purpose of this study was to perform a prospective evaluation of compliance and outcomes after rotator cuff repair in patients with and without Workers' Compensation claims.

Materials and methods

Patient demographics and surgical procedures

From December 2007 to January 2010, 42 consecutive patients with Workers' Compensation claims (Work Comp group), and 50 consecutive patients without a Workers' Compensation claim (non-Work Comp group) underwent surgical treatment and were enrolled in this study. Inclusion criteria consisted of (1) a full-thickness rotator cuff tear, (2) consenting to a home health nurse and therapist to asses them at home, (3) an ultrasound examination at least 9 months after surgery, and (4) at least 12 months of clinical follow-up after surgery. Patient data for the 2 patient groups are presented in Table I. The Work Comp group was composed of 8 women and 34 men, and their average age was 51.4 years. The non-Work Comp group was composed of 19 women and 31 men, and their average age was 62.9 years.

All patients underwent an arthroscopic rotator cuff repair and a subacromial decompression at the time of surgery. If possible, a transosseous equivalent suture bridge-type repair was performed as the main repair technique. For those larger tears where this was not possible, a margin convergence technique was used when appropriate. Massive tears that could not be fully mobilized and fully repaired to the tuberosity were treated with a partial repair under minimal tension. A concomitant biceps procedure was performed in 7 of 42 patients (16%) in the Work Comp group and in 10 of 50 patients (20%) in the non-Work Comp group. A concomitant labral repair was performed in 1 patient (2%) in the Work Comp group and 1 patient (2%) in the non-Work Comp group.

At the time of surgery, tear size was classified according to the criteria established by Cofield et al,[3] and the location and number of tendons involved was recorded. In the Work Comp group, 13 tears were classified as small, 16 as medium, 11 as large, and 2 as massive. Thirty-two tears were classified as 1-tendon tears, 8 as 2-tendon tears, and 2 as 3-tendon tears. In the non-Work Comp group, 16 tears were classified as small, 20 as medium, 12 as large, and 2 as massive. Thirty-five were classified as 1-tendon tears, 13 as 2-tendon tears, and 2 as 3-tendon tears.

Table I Patient preoperative data by group

Variable	Work Comp (n = 42)	Non-Work Comp (n = 50)
Average age, years	51.4	62.9
Sex, No.		
Female	8	19
Male	34	31
Smokers	25	12
Diabetes	2	10
>High school education, %	29	76
Married, %	62	84
Tear size, No.		
Small	13	16
Medium	16	20
Large	11	12
Massive	2	2
Tendon tears, No.		
1 tendon	32	35
2 tendons	8	13
3 tendons	2	2

Monitoring of compliance

Preoperatively, patients were instructed that they would be required to wear a shoulder immobilizer for 6 weeks after surgery. The immobilizer was to be worn at all times and could be removed only for daily pendulum exercises and for dressing and bathing. Patients were also instructed that the immobilizer would be discontinued at their 6-week follow-up appointment with their surgeon and at that point they would be required to attend 7 weeks of formal outpatient physical therapy, with 3 treatments weekly for a total of 21 sessions, to restore motion and then would begin strengthening.

For the first 3 days after surgery, a licensed home health nurse and physical therapist went to the patient's residence to check the surgical site and instruct the patient on the proper way to do the pendulum exercises. At all 3 of these home visits, the nurse and therapist documented and recorded whether the patient was wearing the shoulder immobilizer upon meeting the patient at the residence. If the patient was not wearing the shoulder immobilizer as instructed, this was recorded as a noncompliant event.

At the patient's follow-up office visits with the treating surgeon at 1, 3, and 6 weeks, it was also documented and recorded whether the patient was wearing the shoulder immobilizer at these appointments. Failure to have the shoulder immobilizer on as instructed at these follow-up visits was recorded as a noncompliant event.

Lastly, the outpatient physical therapists treating the patients between 6 and 13 weeks postoperatively documented and recorded attendance at all 21 prescribed physical therapy sessions. Failure to attend a scheduled appointment was recorded as a noncompliant event.

Outcome measures and range of motion analysis

All patients were required to complete questionnaires to determine their American Shoulder and Elbow (ASES), Simple Shoulder Test (SST), and visual analog scale (VAS) pain scores. Patients were video recorded while performing a standardized range of motion examination evaluating forward elevation, external rotation, and internal rotation at the 1-year postoperative visit. The digital camera was placed at the height of the shoulder directly in line with the shoulder. Forward elevation was recorded in the sagittal plane with the patient oriented perpendicular to the camera. External rotation was recorded with the patient seated and the camera overhead so trunk rotation could be taken into account. Internal rotation was measured with the patient standing and the camera directly posterior