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Abstract

Isokinetic assessment of shoulder rotator cuff sutures 36 months after surgery

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The rotator cuff lesion is one of the most common shoulder pathology. A well-achieved rehabilitation usually guarantees a successful recovery. Our preliminary study [1] showed that, our patients suffered from significant strength and mobility deficiency 6 months after surgery. The goal of this second study is objectifying in the long term the patient profile after rotator cuff surgery.

Our first study dealt with 42 rotator cuff suture performed by 2 surgeons. The second study reexamined 34 of them 3 years later. The isokinetical evaluation of the rotator's strength was made in concentric mode at 60, 120 and 240 degrees per second and at 60 and 180 degrees per second for the abductors-adductors. The evaluation modalities *"for the rotators*" were: patient lying supine, arm abducted to 90 degrees in the frontal plane (the engine rotating axis matches with the glenohumeral joint centre). The testing position *"for the abductors-adductors"* was the following: lateral lying supine, dynamometer behind the patient, against rest put on the distal part of the arm, amplitude purposely ranging from 0 to 90 degrees of abduction. Range of motion, peak torques (absolute and body-weight normalized values) and the ratios were taken into account.

When comparing to the unaffected arm at low speed 3 years after surgery, male patients gained 1% for the external rotators (-16% after 6 months), 10% for the internal rotators (-6%), 3% for the abductors (-21%) and for the adductors (-7%). Females showed the same gain for the external rotators (-21% at 6 months), 9% for the internal rotators (-5%), 7% of gain to the adductors (-10%) and 1% of deficiency for the abductors (-23%).

At 6 months, the dominant factor was crucial in the strength recovery process. The biggest difference (especially at low speed) as compared to the unharmed arm was noticed on the internal rotators: 2% of deficiency among the dominant-side operated shoulder and 18% among the non-dominant side. This effect is gradually weakening after 3 years and the internal rotators regain 12% among the dominant-side and 2% (non significant) among the non-dominant side. Surprisingly enough, the external rotators of non-dominant shoulders regain strength (26% at low speed; -13% at 6 months) whereas there still is a 6% deficiency (-20% at 6 months) for the dominant-side patients.

Normalization is obtained when comparing the results between dominant-side operated men and referential sedentary men. The same comparison at low speed among female patients gives us normalized rotators, a 23% deficiency for the abductors (-28% at 6 months) and 28% for the adductors (-36% at 6 months). The external rotators recovery is better among patients operated after a traumatism than among degenerating shoulders ($p < 0.05$) and those who underwent surgery on only one tendon recovered their abductors-adductors better than those operate of more than one tendon.

The amplitude for men shows a 1% deficiency on internal and external rotation whereas women's deficiency is 2% on external rotation and 5% (non-relevant) on internal rotation.

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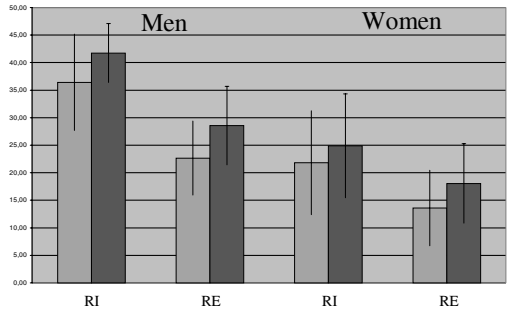
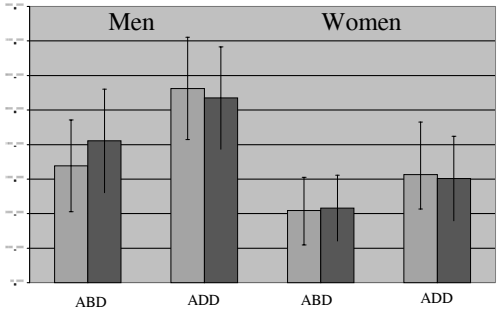
Shoulder Internal and External rotator peak torques (in N.m) comparison at 60°/sec between men and women operated arms



Shoulder abductor and adductor peak torques (in N.m) comparison at 60°/sec between men and women operated arms



We can conclude that a 3-year strength recovery is similar for male and female patients. Mobility does not cause any problems on men whereas women do keep a non-relevant deficiency on internal rotation. The patient's age (thus the trophique tissue quality) modified the results: harmed patients (50, 7 years old on average, $n = 18$) recovered better than degenerating ones (58, 7 years old on average, $n = 16$). The heaviness of surgery also influences the recovery. Our patients showed a nearly normal mobility and a "stronger" shoulder than the healthy one. However the findings have to be taken cautiously because of no pre-surgery tests. Our patients still showed weakness six months after surgery, which let us wonder whether the rehabilitation was not stopped too prematurely. 3 years after the operation, we can conclude that this kind of surgery fully restores all functional features and a well-achieved 6-month rehabilitation seems to be enough.

Reference

[1] Shoulder isokinetic exploration following shoulder rotator cuff suture, *Isokinetics and Exercise Science* **11**(1) 2003, 55–56.