

Brox JI, Gjengedal E, et al. Arthroscopic surgery versus supervised exercises in patients with rotator cuff disease (stage II impingement syndrome): A prospective, randomized, controlled study in 125 patients with a 2 ½ year follow-up. J Shoulder Elbow Surg 1999;8:102-11.

Design: Randomized clinical trial

Population/sample size/setting:

- 125 patients treated for stage II impingement (59 women, 66 men, mean age 48) in a university physical medicine department in Norway
- Eligibility criteria were age 18 to 66, 3 months of shoulder pain resistant to physical therapy, NSAID, and steroid injection (all had at least 1 injection), pain on isometric or eccentric tests, normal glenohumeral ROM, positive impingement sign (re-assessed pain 15 min after injection of lidocaine)
- Exclusion criteria were arthritis of AC joint, cervical root problem, rotator cuff rupture, glenohumeral instability (positive apprehension test or relocation test), or bilateral muscular pain with tenderness and inability to relax shoulder, neck, or TMJ on examination

Main outcome measures:

- Randomized by permuted blocks to arthroscopic surgery (n=45), placebo rx with unfocused laser twice weekly for 6 weeks (n=30), or exercise program with supervision for 1 hour twice weekly for 3-6 months (n=50)
 - o Arthroscopic surgery group had bursectomy and resection of the anterior and lateral part of the acromion as well as resection of the coracoacromial ligament
 - Postoperative rehabilitation began on the first postop day with low resistance exercises, and patients were later seen by physical therapists near their homes, where a variety of PT approaches may have been used
 - Unrestricted activities were resumed at 4 to 6 weeks
 - o Exercise group had supervised relaxed repetitive movements for one hour twice weekly and exercises at home for the remaining days of the week
 - The training continued for 3 to 6 months, with gradual reduction in the amount of supervision as resistance was gradually added
 - o Placebo group had 12 sessions of a detuned laser by a physiotherapist twice weekly
- Primary design was for follow-up at 6 months, but blinded f/u was also performed at 3 months and an unblinded f/u at 2 ½ years
- Neer shoulder score (100 point scale including pain, clinical testing of function, active ROM, and x-ray) was main outcome criterion; numerous secondary outcomes were also measured; success defined as Neer score of 80 points; failure defined as either Neer score <80 or (in placebo and exercise groups) as having surgery after the randomized treatment had been done

- Baseline characteristics similar except that percent of women in surgery group (36%) was lower than for exercise group (56%)
- 110 patients had success/failure measured at the 2 ½ year f/u; success was seen in 26/38 surgery patients, 27/44 exercise patients, and 7/28 placebo patients
- 14 patients randomized to surgery did not have surgery; 11 exercise patients and 15 placebo patients had surgery during 2 ½ years of study
- Intention to treat analysis showed that both surgery and exercise had better adjusted (for sex, pretreatment sick leave, and regular medication) odds of success than placebo (OR of 6.6 and 4.8 respectively); odds for success were similar in surgery and exercise groups
- Patients randomized to placebo and exercise who crossed over to surgery had improvements similar to those randomized to surgery

Authors' conclusions:

- Both surgery and supervised exercises are better than placebo for stage II impingement, and there are no significant differences between surgery and exercise
- Patients who do not do well with exercise should be considered for surgery, but the prognosis is poor in patients receiving regular pain medication or who are on sick leave

Comments:

- Presentation of methods and results is convoluted and sometimes difficult to follow, with interspersed of numerous secondary analyses and some discrepancies between results in text and in tables
 - o The median Neer score at 2 ½ years was 77.5 for the placebo group in the text, but 81.5 in Table VI to which the text refers
- Primary outcome was to have been at the 6 month f/u, but the text presents major outcome data for the 2 ½ year unblinded f/u
- The surgical intervention is described as bursectomy with resection of the coracoacromial ligament and resection of the anterior and lateral part of the acromion; this may not represent current surgical practice, which generally describes thinning of the undersurface of the acromion and removal of osteophytes
- Description of supervised exercise was adequate, with reference to a detailed description elsewhere
- Exclusion criteria included rotator cuff rupture and glenohumeral instability; criteria for ruling these out are given for glenohumeral instability but not for rotator cuff rupture
- Type 2 impingement, as the authors mention, presupposes what has become a controversial explanation of the pathogenesis of shoulder pain, which may or may not arise from compression of the rotator cuff by the overlying acromion; the condition under treatment may be designated as chronic tendinosis, where "chronic" means more than three months of pain resistant to PT, NSAIDs, and steroid injection

Assessment: adequate for some evidence that in patients with conservatively treated rotator cuff tendinosis lasting more than three months, a supervised exercise program may be as effective as surgical resection of the subacromial bursa, the coracoacromial ligament, and the anterior and lateral part of the acromion