

High Prevalence of Incidental Rotator Cuff Abnormalities on Magnetic Resonance Imaging (MRI) in 1204 Shoulders from the General Population

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INTRODUCTION:

Shoulder pain is a common musculoskeletal complaint and frequently linked to rotator cuff (RC) disease. Although imaging is widely used in clinical evaluation, its diagnostic value remains uncertain. Studies in other joints have shown poor concordance between structural abnormalities and symptoms (Englund NEJM 2008, Jensen NEJM 1994), yet population-based data for the shoulder are lacking. Existing evidence is limited by bias and low certainty. We aimed to determine the prevalence of RC abnormalities on MRI in a representative population sample and evaluate their concordance with shoulder symptoms.

METHODS:

We studied 602 participants aged 41–76 years, drawn from a nationally representative Finnish population sample (Figure 1). All participants underwent clinical shoulder assessment and bilateral 3T MRI. We classified RC tendons as normal, tendinopathic, or exhibiting partial-thickness tears (PTT) or full-thickness tears (FTT) and assessed shoulder symptoms through structured interviews and standardized questionnaires. We compared the prevalence of RC abnormalities across age groups and between asymptomatic and symptomatic shoulders, adjusting for confounders including demographic factors, concurrent MRI findings, and clinical examination.

RESULTS:

RC abnormalities were detected in 99% of participants (595/602) (Table 1). Prevalence and severity increased with age and did not differ by sex (Figure 2). PTTs were found in 43% of participants aged ≤45 years, rising to 65% in those ≥70; FTTs increased from 0% to 29% across the same age span. Among those with FTTs (n=70), the supraspinatus was involved in 97% (68/70), the infraspinatus in 29% (20/70)—usually with concurrent supraspinatus involvement—and the subscapularis in 9% (6/70) (Table 2).

RC abnormalities were observed in 96% of asymptomatic shoulders (1039/1076) and 98% of symptomatic shoulders (126/128), indicating poor concordance between imaging abnormalities and symptoms (Table 3). FTTs were more prevalent in symptomatic shoulders (14.6%) compared to asymptomatic shoulders (6.5%), but this difference diminished to 0.8% after adjusting for concurrent MRI abnormalities and clinical examination findings (Table 3). Of the 96 FTTs identified, 78% (75/96) were observed in asymptomatic shoulders. Among the 26 participants with bilateral FTTs, 65% (17/26) reported no symptoms in either shoulder, and 19% (5/26) reported symptoms in only one shoulder (Figure 3).

DISCUSSION AND CONCLUSION:

In conclusion, MRI examination of the shoulder reveals that RC abnormalities are present in nearly all individuals over 40 years of age, irrespective of symptoms. Given that tendinopathy, PTTs, and even FTTs may be incidental findings, clinicians should carefully consider the high prevalence of these abnormalities when interpreting imaging results and planning therapy. Reframing these findings as age-related changes rather than abnormalities may help guide more appropriate care and reduce unnecessary interventions.

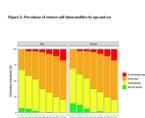


Table 1. Overall prevalence of rotator cuff abnormalities per participant (n=602) and by sex in the Finnish population aged 41–76 years.

Parameter	n	Prevalence, % (95% CI)
Number of rotator cuff abnormalities	595	98.8 (98.2–99.4)
Normal	1	0.2 (0.0–0.4)
Tendinopathy	35	5.8 (4.7–7.0)
Partial-thickness tears	235	39.0 (36.3–41.7)
Full-thickness tears	124	20.6 (18.3–23.0)

Table 2. Distribution of full-thickness tears (FTTs) by tendon and shoulder involvement.

Parameter	n	Prevalence, % (95% CI)
Number of FTTs	70	11.6 (9.7–13.8)
Supraspinatus	68	97.1 (93.8–100)
Infraspinatus	20	28.6 (20.3–37.8)
Subscapularis	6	8.6 (3.7–13.5)

Table 3. Prevalence of rotator cuff abnormalities in asymptomatic and symptomatic shoulders, adjusted for concurrent MRI findings and clinical examination.

Parameter	n	Prevalence, % (95% CI)
Number of asymptomatic shoulders	1076	96.0 (95.2–96.8)
Number of symptomatic shoulders	128	98.4 (97.6–99.2)