

FACT SHEET

The effect of shockwave on shoulder tendinopathy with and without calcification (*beta version*)

INTRODUCTION

Skuldertendinit(1)

Occurrence

- Tendinitis makes up the majority of all shoulder disorders and the vast majority are localized to the supraspinatus

Clinical findings

- Supraspina stendinitis is characterized by a positive isometric abduction test and positive impingement test
- Infraspinatus tendinitis is characterized by a positive isometric outward rotation
- Subscapularis tendinitis is characterized by positive isometric inward rotation
- Bicep stendinitis is characterized by pain at the same time isometric flexion and supination of the elbow and is very rare

Calcifications are found in 3% of asymptomatic shoulders, and between 10 – 40% of painful shoulders.(2) In daily practice, ESWT is used to treat these calcifications but ESWT is also used to treat tendons (most often supraspinatus) without calcifications.

METHOD

Calcifications are found in 3% of asymptomatic shoulders and between 10 – 40% of painful shoulders.(2) In daily practice, ESWT is used to treat these calcifications but ESWT is also used to treat tendons (most often supraspinatus) without calcifications.

It is therefore relevant to assess whether there is an effect of these treatments. For this, we use 2 meta-analyses.

Surace, S. J., Deitch, J., Johnston, R. V., & Buchbinder, R. (2020). Shock wave therapy for rotator cuff disease with or without calcification. The Cochrane database of systematic reviews, 3(3), CD008962. (3)

Angileri, H. S., Gohal, C., Comeau-Gauthier, M., Owen, M. M., Shanmugaraj, A., Terry, M. A., Tjong, V. K., & Khan, M. (2023). Chronic calcific tendonitis of the rotator cuff: a systematic review and meta-analysis of randomized controlled trials comparing operative and nonoperative interventions. Journal of shoulder and elbow surgery, 32(8), 1746–1760.

Primarily, Surace et al. (3) While the study contains 32 studies (194 pages), it is currently not possible to review all 27 studies. We therefore summarize their findings into a guide that is applicable in practice. Angileri et al.(4) only deals with tendons with calcifications, and is of recent date – and thus we include the studies that deal with ESWT. All in all, this study contains 27 studies.

RESULTS

Below is an overview of the methods and effects of the included studies.

Surace et al.(3)			
32 studies included	The treatment effect has been measured:	7 studies with fESWT	Assessment:
2281 included	Baseline, 6 weeks	2 studies with rESWT	* Shoulder Pain And Disability Index (SPADI);
25 studies include participants with calculus	Baseline, 6 weeks, 3 months.		* Shoulder Disability Questionnaire (SDQ);
	Baseline 3 , 6 months.		* Constants core;
5 studies include participants without calculations	Baseline 6, 12 months.	1 bar = 0.1 mJ/mm2	* Disabilities of the Arm, Shoulder and Hand (DASH);
	Baseline, more than 12 monts.	1MPa = 10 bar	* Health Assessment Questionnaire (HAQ)
			* Any other function scale.
			• Composite end points measuring successes of treatment such as participants feeling no further symptoms.
			• Quality of life.
			• Number of participant withdrawals, for example, due to adverse events or intolerance to treatment.
			• Number of participants experiencing any adverse event.
			• Proportion of participants achieving pain score below 30/100 mm on VAS.
			• ROM active preferred over passive measures: shoulder abduction, flexion, external rotation and internal rotation (measured in degrees or other; e.g., hand-behind-back distance in centimeters).
			• For participants with calcification, the effect of ESWT on the size of the calcification.
			• For participants with calcific deposits, the number of participants with complete or partial resolution (defined or not) of calcific deposits.

STUDY	DOSE	CONTROL GROUP	EFFECT	METHOD
12 studies		placebo		
11 studies	High dose ESWT 0.2.-0.4 mJ/mm2	Lav dosis ESWT under 0.2 mj/mm2		
4 studies	ESWT	Dry needling		
Other studies	ESWT	Cortisone blockade		
		Hyaluronic acid (hyaluronsyre)		
		transcutaneous electric nerve stimulation (TENS)		
		Exercise therapy		

		2 treatments versus 1 treatment Different methods used		
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The authors' own conclusion when comparing all the results found in the included studies:

“Based upon the currently available low- to moderate-certainty evidence, there were very few clinically important benefits of shock wave therapy, and uncertainty regarding its safety. Wide clinical diversity and varying treatment protocols means that we do not know whether or not some trials tested subtherapeutic doses, possibly underestimating any potential benefits.

Further trials of extracorporeal shock wave therapy for rotator cuff disease should be based upon a strong rationale and consideration of whether or not they would alter the conclusions of this review. A standard dose and treatment protocol should be decided upon before further research is conducted. Development of a core set of outcomes for trials of rotator cuff disease and other shoulder disorders would also facilitate our ability to synthesise the evidence.”

Angileri et al.			
27 studies included	The treatment effect has been measured:		Assessment:
3 studies 140 participants with surgical procedures	Baseline and up to 10 years (median 12 months)	1 bar = 0.1 mJ/mm ²	As above plus
13 studies 1130 participants with ultrasound-guided barbotage.		1MPa = 10 bar	<ul style="list-style-type: none"> • CMS, Constant-Murley score; • DASH, Disabilities of the Arm, Shoulder, and Hand questionnaire; • VAS, visual analog scale; ROM, range of motion; SSRQ, Short Form Self-Regulation Questionnaire; US, ultrasonography; • MRI, magnetic resonance imaging; • WORC, Western Ontario Rotator Cuff Index; • SF-12, 12-Item Short Form Health Survey; • UCLA, University of California, Los Angeles Shoulder Rating Scale; • CT, computed tomography.
13 studies 736 included with ESWT (some studies compare bar settlement and ESWT)			

STUDY	DOSE	CONTROL GROUP	EFFECT	METHOD
	f+rESWT ESWT high energy	Sham TENS ESWT lav energi		

The authors' own conclusion when comparing all the results found in the included studies:

"Surgical treatment of chronic calcific tendonitis of the rotator cuff results in larger improvement in functional outcome scores and comparable pain reduction to nonoperative interventions, particularly UGN. Both operative and nonoperative treatment modalities are likely to have clinically significant improvements in function and pain, and thus it is reasonable to trial UGN and ESWT as first-line treatment. Cost-effectiveness analyses will be needed to support one treatment over the other. High-quality RCTs directly comparing nonoperative interventions to operative interventions in patients prior to failing conservative treatment are needed to establish high-quality evidence-based guidelines."

CONCLUSION

The conclusions of these 2 review articles are very different – from ESWT not having an effect (3), that it may be used for a possible operation (4).

Based on the clinical guidelines for shoulder disorders from 2021, the following is recommended: *"Do not offer subacromial decompression to patients with subacromial pain syndrome who have had pain for less than 6 months, as no beneficial effect has been found and it is unclear whether there is a risk of side effects."*

(it should be noted that the National Clinical Guidelines are no longer applicable, as they will not be updated in the future).

We therefore have the recommendation that ESWT could be an option within the first 6 months, in combination with other therapy such as exercises.

However, it is important to assess the individual patient individually, including his or her pain.

Our recommendation applies to shoulder problems with calcifications.

There are too few studies to recommend its use for shoulders without calcifications, for specific treatment of the tendon. Other methods that include treatment of the whole shoulder complex, or after the "frozen shoulder" method, may be used for pain management (see fact sheet: "frozen shoulder").

RECOMMENDATION

rESWT Dosage: 4 treatments, 1 week intervals, 2,500 pulses per treatment (500 pulses 1.5 bar, frq 4.5 Hz and 2,000 pulses with 2.5 bar frq 10 Hz).(5)

Dose fESWT: 3 treatments, 1 per week, 1800 pulses, 0.2mj/mm² and to the patient's maximum pain tolerance

Sitting or lying down, hand on lower back or as close as possible depending on the pain. (= starting position for scanning the supraspinatus with ultrasound)(5)

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