

# Extracorporeal Shock Wave Therapy in Calcifying Tendonitis of the Shoulder. Case Report

Oyama Arruda Frei Caneca Júnior<sup>1</sup>

## Abstract

Calcific tendonitis in the shoulder is very common. Patients who do not improve with physical therapy treatment may benefit from shockwave treatment before an invasive procedure is indicated. The focused shockwave treatment has a high degree of recommendation in calcific tendonitis of the shoulder, according to several studies with a high level of evidence. This report shows a 58-year-old female patient with calcific tendonitis of the shoulder with pain for more than 6 months without response to medication and rehabilitation treatment. Four sessions of 3000 pulses were performed with a focused shockwave piezoelectric device, with a maximum level of energy of 0.4 mj/mm<sup>2</sup>. Pain remission and calcification resorption were verified 3 months after the last application. Extracorporeal Shockwave Treatment is a safe and effective alternative for calcific tendonitis of the shoulder.

**Keywords:** ESWT, calcific tendinopathy, shoulder

## Introduction

The formation of calcium deposits in the rotator cuff tendons is very frequent and can appear in 2.7% up to 20% of the general population [1]. In most cases, they are asymptomatic and preferentially affect women between 30 and 60 years of age [1].

The most common site of formation of this calcium deposit is the supraspinatus (80%), followed by the infraspinatus (15%), with the subscapularis and teres minor being affected in only 5% of cases [2].

The diagnosis is simple and can be made with an X-ray, complemented by ultrasound, which is the more accessible and less expensive method. Magnetic resonance imaging or computed tomography is used for specific cases or to rule out associated pathologies.

Calcifying tendonitis of the shoulder can be classified in several ways. Regarding size, calcifications considered small are those smaller than 0.5 mm, medium calcifications between 0.5 and 1.5 mm, and large calcifications are those larger than 1.5 mm [3].

Three distinct stages in the disease process

have been described: Pre-calcific, calcific, and post-calcific. Depending on the stage of the disease, the imaging appearance and physical consistency of the calcification differ significantly, as do the patient's symptoms [4].

The factors that cause the onset of the pre-calcific stage remain unknown, which makes the etiology of calcifying tendinitis of the shoulder not yet fully established.

The next stage (calcific) consists of three phases: The formative, resting, and resorptive phases. During the formation phase, calcium crystals are deposited in matrix vesicles that coalesce and gradually form the calcific deposit. In the resting phase, calcium deposition is complete, and fibrocartilaginous tissue surrounds and isolates the calcific deposit. During these two phases, calcium deposits have a chalk-like appearance. The formative and resting phases are chronic, usually lasting a few years, and may be associated with different degrees of pain, intermittent or constant, at rest or with movement.

Another important factor is the radiographic aspect of the calcification, which, according

to Gärtner [5], is classified as Type I, with dense and rounded with regular borders, Type II, with irregular and less homogeneous borders, and Type III, with irregular and transparent borders, which indicate the possibility of spontaneous resorption.

In some cases, a sudden worsening of symptoms corresponds to the resorptive phase, when the patient usually seeks emergency services. In this phase, calcification takes the form of toothpaste, and drug treatment is indicated to relieve symptoms that can last up to 2 weeks. At this stage, shock waves should not be used, as there is already exacerbated inflammation and the symptoms can worsen even more.

Shock waves are generally indicated in the stages of calcification in which the situation stagnates and transforms into a chronic condition, but they can also be used after acute episodes with no resorption of the calcification [6].

## Case Report

A 58-year-old woman presented with no comorbidities and a history of left shoulder pain for at least 2 years. During this period,

<sup>1</sup>GOT - Orthopedics and Traumatology Group, Recife, Brazil.

### Address of Correspondence

Dr. Oyama Arruda Frei Caneca Júnior,  
GOT - Orthopedics and Traumatology Group, Recife, Brazil.  
E-mail: oyama.arruda@gmail.com



Dr. Oyama Arruda Frei Caneca Júnior

Submitted Date: 15 Feb 2024, Review Date: 10 Mar 2024, Accepted Date: 30 Jun 2024 & Published: 30 Jun 2024

Journal of Regenerative Science | Available on [www.jrsonweb.com](http://www.jrsonweb.com) | DOI:10.13107/jrs.2024.v04.i01.119

© The Author(s). 2024 Open Access. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted use, distribution, and non-commercial reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.



**Figure 1:** Radiograph of the left shoulder with calcium focus prior to shockwave treatment.



**Figure 2:** Radiograph of the left shoulder after shockwave treatment. Reabsorbed calcium deposit.

she reported several emergency room visits due to exacerbated shoulder pain, requiring the use of analgesics. She also reported having performed three corticosteroid injections during periods of worsening pain. She was also referred for physiotherapy treatment, which included ultrasound, TENS, and exercises. The patient had reduced shoulder mobility in elevation and external rotation, with positive Neer and Jobe tests. As the examinations presented in the first consultation had been performed more than 1 year ago, an ultrasound of the shoulder was requested, which showed calcific deposits of 1.8 cm in the supraspinatus and 1.2 cm in the subscapularis, without the presence of areas of rupture in the tendons.

Shockwave treatment was indicated. Initially, three applications were performed at weekly intervals with a piezoelectric-focused machine.

In each session, 3000 pulses were used with a 10-mm applicator, with the energy used reaching 0.4 mJ/mm<sup>2</sup> in the piezoelectric device. Before each application, an

ultrasound evaluation was performed to measure the distance from the skin to the calcification and to mark the location in a neutral position and internal rotation (Fig. 1 and 2).

The patient returned for reassessment 3 weeks after the third application, reporting considerable improvement in pain but still complaining of pain and limitations in elevation.

The X-ray performed at this visit showed that there was still a voluminous calcific deposit in the supraspinatus.

A fourth application was performed in the same pattern as the previous ones.

The patient returned for consultation 3 months after the fourth application. She was asymptomatic, and the X-ray showed resorption of the calcific deposit. Strengthening exercises for the shoulders were instructed on the occasion.

### Discussion

Shockwave treatment in calcifying tendinitis of the shoulder has a high degree of

recommendation in several studies using focused shockwaves [7]. The evaluation of the patient regarding the stage of the pathology also directly interferes with the result. Shockwave treatment should not be used in the resorptive phase under any circumstances, under the risk of aggravating the patient's pain [6].

There is still no single consensus that indicates the best protocol for using shock waves in the treatment of calcifying tendinitis of the shoulder. The scheme of three applications in a row on a weekly basis seems to be the best used so far.

The use of ultrasonography also seems to provide greater precision in the application, considering the recommendation that calcific tendinitis of the shoulder should be treated only with focused waves [8].

It is important to carry out an adequate follow-up with the patient, always warning before starting the treatment that the pain may be exacerbated if there is a rapid reabsorption of the calcific deposit.

Shockwave treatment is a regenerative medicine modality, and as such, it takes time for the biological response necessary for tissue regeneration to occur, which provides the reabsorption of the calcium deposit, which is not determined by the mechanical action of the shock wave on calcification.

### Conclusion

Shockwave treatment is a safe and effective alternative in the treatment of calcifying tendinitis of the shoulder, which does not evolve to spontaneous resolution after the resorption period in patients in which arthroscopic surgical resection would be an option.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

**Conflicts of Interest:** Nil. **Source of Support:** None.

## References

1. Chianca V, Albano D, Messina C, Midiri F, Mauri G, Aliprandi A, et al. Rotator cuff calcific tendinopathy: From diagnosis to treatment. *Acta Biomed* 2018;89:186-96.
2. Moreira G. *Tratado de Dor Musculo Esquelética*. 2ª ed. Cap. 18. Dor no Ombro. São Paulo: Ed. Alef; 2022.
3. Bosworth BM. Calcium deposits in the shoulder and subacromial bursitis. *J Am Med Assoc* 1941;116:2477-82.
4. Kim MS, Kim IW, Lee S, Shin SJ. Diagnosis and treatment of calcific tendinitis of the shoulder. *Clin Shoulder Elb* 2020;23:210-6.
5. Gärtner J. Tendinosis calcarea: Results of treatment with needling. *Z Orthop Ihre Grenzgeb* 1993;131:461-9.
6. *Tratado de Ondas de Choque*. Sociedade Médica Brasileira de Tratamento Por Ondas de Choque. 1st ed., Cap. 7. Tratamento por Ondas de Choque em Patologias do Ombro. Sao Paulo: Ed Alef; 2022. P. 89-98.
7. Moya D, Ramón S, Schaden W, Wang CJ, Guiloff L, Cheng JH. The role of extracorporeal shockwave treatment in musculoskeletal disorders. *J Bone Joint Surg Am* 2018;100:251-63.
8. Moya D, Ramón S, Guiloff L, Gerdesmeyer L. Current knowledge on evidence-based shockwave treatments for shoulder pathology. *Int J Surg* 2015;24:171-8.

Conflict of Interest: NIL  
Source of Support: NIL

### How to Cite this Article

Caneca OAF Jr. | Extracorporeal Shock Wave Therapy in Calcifying Tendonitis of the Shoulder. Case Report | *Journal of Regenerative Science* | Jan-Jun 2024; 4(1): 03-05.