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Dr. Shreesh Kadur JM
M.B.B.S., M.S, DNB,
Orthopaedic Surgeon, Sky
Superspeciality Hospital, Iritty,
Kannur, Kerala, India

Dr. Sharvani S
M.B.B.S., MD, Senior Resident,
Kodagu Institute of Medical
Sciences, Madikeri, Karnataka,
India

Dr. Hareesh Babu M
M.B.B.S., MD, Consultant
Radiologist Sky Superspeciality
Hospital, Iritty, Kannur, Kerala,
India

Corresponding Author:
Dr. Shreesh Kadur JM
M.B.B.S., M.S, DNB,
Orthopaedic Surgeon, Sky
Superspeciality Hospital, Iritty,
Kannur, Kerala, India

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Percutaneous needle aspiration of calcific tendinitis: A modified technique

Dr. Shreesh Kadur JM, Dr. Sharvani S and Dr. Hareesh Babu M

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Abstract

Calcific tendinitis of shoulder is a disorder common in middle aged women. It goes through a cyclical course to leave a residual stiffness. Several therapies such as sonography, acetic acid iontophoresis, shockwave lithotripsy, and percutaneous aspiration of the calcifications have been tried. Surgical treatment has been used as last option. Among these, percutaneous needle aspiration under ultrasonography with a modified technique has been successful in a 48 year female with dramatic relief of symptoms in few weeks to months. Hence this technique which is minimally invasive and painful can be used widely for this common disorder as a therapeutic method.

Keywords: calcific tendinitis, ultrasonography, percutaneous needle aspiration

Introduction

Calcific tendinitis of the shoulder is a self-limiting calcification (calciumhydroxyapatite crystal) of the rotator cuff muscles. It is evident radiologically in around 7.5 to 20 percent of asymptomatic adults and 6.8 percent in persons suffering from shoulder pain. Women of age 30-60 years are more likely to be affected. Bilateral involvement is also seen [1].

Conservative management of the disorder includes oral non steroidal nonsteroidal antiinflammatory drugs, physical rehabilitation to prevent loss of joint mobility, and local steroid injections [2]. When conservative methods fail, several alternative treatments have been proposed: surgery, sonography, acetic acid iontophoresis, shockwave lithotripsy, and percutaneous aspiration of the calcifications [3].

No proper literature exists to guide as the best alternative treatment. Because calcific tendinitis of the shoulder is a self-limited process, its treatment should be not only effective but as little invasive as possible and free of complications.

In 1995 a study was performed by Farin and Jaroma regarding ultrasound guided aspiration using percutaneous approach. They used two needle (18-19 gauge) which gave prompt pain relief but there was concern of potential injury to rotator cuff tendons due to multiple punctures with large bore needles. Due to paucity of studies regarding the technique and results we have performed a less traumatic way using single small bore needle using ultrasonography [4].

Case Report

A 48 year female presented to us with pain in the right shoulder from 6 months which exacerbated from last two weeks with rest pain. She was unable to do her routine household chores. On examination there was global restriction of active and passive range of movements. Shoulder Pain and Disability Index (SPADI) [5] scoring (102/130) (table 1) was obtained after patient answered the questionnaire (translated to regional language). Radiograph of the right shoulder showed calcification in the rotator cuff muscles. (fig 1). Patient was diagnosed to have calcific tendinitis of the shoulder and was given conservative trail for 2 weeks from which she had only minimal relief. Subsequently, patient was given option of minimally invasive technique of percutaneous needle aspiration and lavage under ultrasonography. Informed written consent was obtained for the same.

After explaining about procedure, it was performed with the patient seated. A linear 10–12-MHz transducer (LOGIQ F8 Expert, GE Health care) was used to locate the calcification. A curvilinear calcification of 10mm *2mm involving supraspinatus tendon was noted (fig 2). The arm of the patient was placed in internal rotation, with the hand behind the back. Lavage of the calcifications was performed after an anterior and caudocranial approach to keep the syringe below the calcification. After the skin was cleaned and sterilized, a 22-gauge needle was introduced into the shoulder under sonographic guidance using a freehand technique, following the plane of the ultrasound beam (Fig. 2). The needle was connected to a syringe filled with 2% lidocaine hydrochloride (Easycaine, Aesmira, Miracalus Pharma pvt Ltd). After the pathway and the subacromial–subdeltoid bursa were anesthetized, the tip of the needle was introduced into the calcification. Once there, the plunger was pushed a short way

until a small quantity of fluid managed to penetrate the calcification and appear on the sonogram. The force of the plunger was released momentarily to see the refilling of syringe with cloudy material. Then the calcification of 0.5 ml was aspirated. Few punctures (3-4) were done in the calcification before removing the needle. The needle was drawn back to the subacromial–subdeltoid bursa to inject 40 mg of triamcinolone acetonide (Kenacort, Abbott laboratories) to prevent bursitis. Patient was discharged with a prescription for nonsteroidal antiinflammatory drugs. Patient was followed up at 1, 2, 4 weeks and 2 months. Patient had decrease in the pain of 50 percent in 4 weeks duration and at the end of 2 months SPADI was down by 40 points. Range of movements were improved drastically (fig 3). Radiograph of the shoulder showed disappearance of the calcification. (fig 4)

Table 1: Shoulder pain and disability index questionnaire

Scale and Question No. Question	Question
Pain scale	How severe Is your pain?
1	At its worst?
2	When lying on the involved side?
3	Reaching for something on a high shelf?
4	Touching the back of your neck?
5	Pushing with the involved arm?
Disability scale	How much difficulty do you have?
1	Washing your hair?
2	Washing your back?
3	Putting on an undershirt or pullover sweater:
4	Putting on a shirt that buttons down the front?
5	Putting on your pants?
6	Placing an object on a high shelf?
7	Carrying a heavy object of 10 lbs (4.5 kg)?
8	Removing something from your back pocket?



Fig 2: Pre procedural radiograph of shoulder showing calcification in rotator cuff

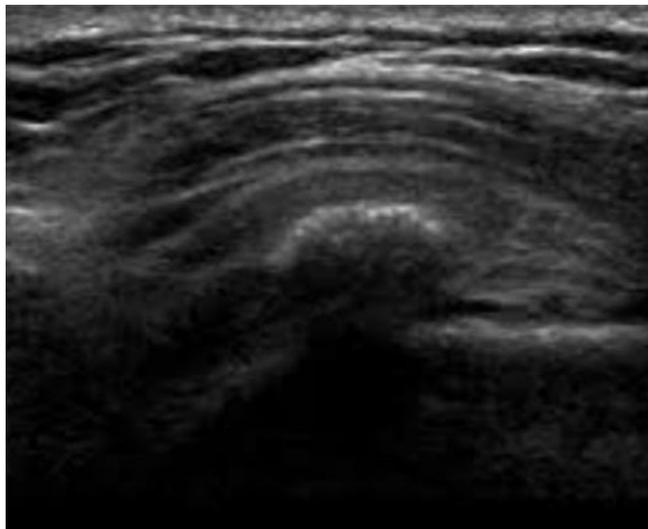


Fig 3: Ultrasonography picture showing calcification in supraspinatus muscle



Fig 4: Range of movements of shoulder at 2 months follow up



Fig 5: Post procedural radiograph of shoulder showing disappearance of calcification

Discussion

Calcific tendinitis exact mechanism is unknown. A tissue hypoxia theory postulates a so-called critical zone in the rotator cuff that becomes vulnerable to calcification, that zone being located 1 cm from the tendinous insertion of the supraspinatus on the greater humeral tuberosity). According to Uhthoff and Loehr, tissue hypoxia precedes fibrocartilaginous metaplasia and necrosis, which is then followed by a propensity for calcification deposits. It has been described as a cyclical course of progression into calcific tendinitis and spontaneous resolution with or without residual stiffness [2].

Several therapies have been proposed if conservative management fails. Shock wave therapy is one of them. It has good results in short term (53-71%). However, shockwave therapy is frequently painful and requires special equipment, so it is relatively expensive. Surgery is more effective than shockwave therapy in the long term, achieving clinical improvement in 79–100% of the shoulders. However, rehabilitation is always required and is not free of complications. Currently, surgery is considered the last option [3, 6]. Percutaneous needle aspiration is widely available and minimally invasive and painful. It allows patient to return to work.

There are several techniques of aspiration and lavage. Some authors attempted to aspirate the calcification repeatedly [4]. We used only one aspiration and lavage procedure per calcification in an attempt to avoid unnecessary damage of a tendon already weakened by calcific tendinitis. We performed the procedure with the patient seated and with one arm behind the back. Similar technique was used by del Cura *et al.* [3]. This position has the advantage of allowing the syringe to be placed below the level of the calcification, which permits the calcium to fall to the bottom of the syringe, thus preventing it from being reintroduced. In addition, this arm position increases pressure in the tendon and facilitates draining the fluid without pulling the plunger. However, our study contradicts to the study done by Aina *et al.* [7] who found no improvement in the patients where no aspiration or minimal aspiration was done.

To conclude, this case study tells us that percutaneous needle puncture of the calcification is all that needed to relieve the symptoms of calcific tendinitis of shoulder. However, more number of the patients to be evaluated for a definitive conclusion.

Statement of Consent: Informed written consent was taken from the patient to publish the case report for educational purpose.

Conflict of Interest : None

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