CASE REPORT

Pain relief in a young woman with adhesive capsulitis after manual manipulation of the acromioclavicular joint for remaining symptoms after mobilisation under anaesthesia

Stina Lilje,¹ Madeleine Genberg,² Hassan Aldudjaili,² Eva Skillgate³

¹Department of Health Care Sciences, Blekinge Institute of Technology, Karlskrona, Blekinge, Sweden

²Scandinavian College of Naprapathic Manual Medicine, Stockholm, Sweden

³Karolinska Institute, Institute of Environmental Medicine, Stockholm, Sweden

Correspondence to

Stina Lilje, titti.lilje@bth.se

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SUMMARY

Adhesive capsulitis is a painful condition with a prevalence of 2–5%. There is a lack of evidence for its aetiology and for conventional treatment and cost effects. This study describes the treatment effects of manual manipulation of the acromioclavicular joint for adhesive capsulitis in a young woman for persisting pain after mobilisation of the glenohumeral joint under anaesthesia. Primary outcomes were pain and physical function, measured by a visual analogue scale and the SF36 health survey. Secondary outcomes were sleep pattern, medication and perceived recovery. The mobility after manipulation under anaesthesia: elevation 55° and no improvement in pain. After manual manipulation: unrestricted elevation and significant pain relief. The patient no longer suffered from sleeping disorders and ceased all medication. Considering the lack of knowledge in aetiology and treatment, specialised manual examination of the acromioclavicular joint should be considered early in patients diagnosed with adhesive capsulitis.

BACKGROUND

Musculoskeletal impairments in the glenohumeral joint (GHJ) are one of the most common reasons for seeking orthopaedic medical care.¹ One of these impairments is adhesive capsulitis (AC), also known as ‘frozen shoulder’, with a prevalence of 2–5% in the general population. The cardinal symptoms of AC are decreased mobility in the shoulder girdle, an insidious onset of pain in/around the GHJ, night pain and a gradual loss of active and passive movement in all directions.² The duration of symptoms ranges from 3 to 36 months, with a mean of 15 months.³ Radiographs are typically normal, but important for eliminating other causes,² and the diagnosis is clinically verified.⁴ The condition is perceived to result from fibrosis and contracture of the joint capsule in the GHJ,² and tenderness over the acromioclavicular joint may be an associated symptom.⁵ The aetiology is unclear and poorly understood; it is common for AC to occur concurrently with other pathological conditions in the GHJ,⁶ which is why the condition is sometimes divided into primary and secondary frozen shoulder.^{7 8} The progress itself is self-limiting, but the condition may persist for years and some patients never fully recover.⁶

Conventional treatments for the condition are medication, physiotherapy, steroid injection, radiography or ‘wait and watch’. Failure to obtain improvement after 6 months is a general indication for surgical intervention,² where manipulation of the GHJ under anaesthesia is the gold standard.⁸ There are inconsistencies and controversy regarding the aetiology and the treatment of AC,^{2 6 9} and no substantial evidence for the treatment or cost effects of conventional treatments.^{10–12}

The aim of this study is to describe the treatment effects of manual manipulation of the acromioclavicular joint in a patient with AC for persisting pain after conventional treatment in primary and secondary care (medication, steroid injection, radiography, physiotherapy and mobilisation under anaesthesia). The case was included in a previously published clinical trial¹ comparing conventional orthopaedic care with manual therapy. The patient was randomised to the control group, where she had mobilisation under anaesthesia; she was not cured until she had manual therapy of the acromioclavicular joint 1 year later. To the best of our knowledge, this has never been described before. Also, a recently accepted health economic evaluation of the clinical trial found the described case to be the most expensive.¹¹

CASE PRESENTATION

The case concerns a previously healthy 29-year-old woman who experienced a dull, deep pain and increasing difficulty lifting her arm, without any definable cause. She had a stressful job at a computer terminal in an office, had a 2 h daily commute, and experienced difficulties while working at her computer terminal and while performing household tasks such as vacuuming, doing dishes, washing and braiding her hair. The ache from her GHJ made sleeping difficult and she could no longer sleep in her preferred (prone) position. She usually woke up several times a night and seldom slept for more than 4 h at a stretch, and was frequently troubled with headache. Vacation and rest made no improvement on her condition. In addition to the symptoms associated with AC the patient also experienced radiating pain and numbness in her right arm, hand and fingers. First, the patient had an appointment with a general practitioner (3 months after onset). Thereafter she had physiotherapy for 5 months,

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with only minor improvement, which was why she was referred to an orthopaedic outpatient department. By that time she agreed to participate in a clinical trial, and was randomised to the control group, (standard orthopaedic care¹), 11 months after onset.

INVESTIGATIONS

General practitioner: Three months after onset, contact with a general practitioner was initiated.

Physiotherapist: After 5 months of consecutive physiotherapy (ie, 8 months after onset) the patient also had a plain radiography performed at her cervical spine and right shoulder, which was unremarkable.

Orthopaedist (11 months after onset): The functions innervated from nervus medianus, ulnaris and radialis were normal, elevation was now 15°, and external rotation was estimated at 30° (table 1). The orthopaedist confirmed the diagnosis M.750 (AC), based on the patient's history and symptoms, and on previous medical records.

Naprapath (23 months after onset): The pain was a deep sensation in and around the right GHJ, and the acromioclavicular joint on the same side had a distinct swelling and tenderness. A swelling was also found over the scalenii muscles on the right side. Palpation on the left side's vertebrae transverse outgrowth on C6, C7 and Th1 gave a sore sensation and her right acromioclavicular joint had a ventral movement restriction. The naprapath's diagnosis was M24.4B (dysfunction of the right acromioclavicular joint) and UNS M02.9B (reactive arthritis).

TREATMENT

The general practitioner performed a steroid injection on the patient, prescribed non-steroidal anti-inflammatory drug and made a referral to a physiotherapist. At her appointment with a physiotherapist 2 weeks later, elevation in the patient's affected shoulder was 80° (external rotation was not recorded). The physiotherapy interventions consisted of laser-device treatment, stretching, massage and trigger point pressure, water-based exercises, taping, transcutaneous electrical nerve stimulation over the affected area, and acupuncture with and without electric impulses. The patient was also provided a home exercise programme focused on mobility and posture. After an additional 3 months of physiotherapy, the patient was prescribed supplementary drugs (panocod, paracetamol, codeine and sleeping pills), and was referred to an orthopaedic surgeon.

Mobilisation under anaesthesia in all movement planes was performed 5 weeks after the first appointment with the orthopaedist (12 months after onset). After the intervention the patient was informed about the importance of continuing the physiotherapy sessions, in order to be able to fully recover. Because of the radiation and 'electric shock' sensations the patient was prescribed a new medication for peripheral nerve pain and epilepsy: Gabapentin Hexal.

Because of the remaining symptoms after completion of the trial (52 weeks), the patient had naprapathic manual therapy. Naprapathic manual therapy¹ is a combination of different manual techniques such as massage, stretching, treatment of myofascial trigger points, and specific mobilisation and manipulation techniques, combined with physical exercises. Naprapaths work under their own diagnostic and clinic responsibility, and since 1994 the naprapathic profession is a part of the Swedish health and medical care system, licenced by the National Board of Health and Welfare, for preventing, evaluating and treating patients with musculoskeletal pain and pain-related disability.

During the first four sessions the naprapath performed massage around the GHJ and thoracic area and treatment of myofascial trigger points (by pressure) in the surrounding muscles. Ultrasound treatment was performed over the right acromioclavicular joint and tuberculi minoris humeri with a low dose (3.3–3.9 W) for only 3 min, as well as careful, general mobilisation of the right GHJ and acromioclavicular joint, due to the pain. The home exercises consisted of supported elevation of the right arm, self-mobilisation of the GHJ (elevating the patient's right arm with her right hand: 'climbing the wall') and the acromioclavicular joint (careful outward rotation of the right arm, in flexion), and stretching of the scalenii muscles on the affected side. On the fifth session a high velocity manipulation with a thrust was performed to the right acromioclavicular joint, in a lateral/cranial direction, and a cracking sound was heard. The patient was advised only to take the antiflogistic medication, panocod, and to gradually decrease intake of her antiepileptic medication, Gabapentin Hexal, as prescribed by her doctor.

OUTCOME AND FOLLOW-UP

The general practitioner's injection and the medication had no effect on the patient's symptoms.

During physiotherapy, the mobility of the affected shoulder varied over time, but the pain and sleeping disorders persisted. After mobilisation under anaesthesia the active abduction increased, but the pain, 'electric shock sensations' and sleeping disorders persisted. For primary and secondary outcomes see table 1. Almost a year after the surgical intervention (23 months after onset), the patient's mobility, pain and sleep disorders were unchanged, which is why she had an appointment with a licenced naprapath.

Directly after the manual manipulation of the acromioclavicular joint the elevation was 130°. At follow-up 1 week later the patient reported that she had experienced severe pain for a couple of hours directly after the manual manipulation, after which the numbness and electric sensations in her arm and hand disappeared. She was now able to move her right arm without restriction. The patient had ceased the panocod medication, and was gradually decreasing her Gabapentin Hexal medication as planned, and she was also able to sleep through the night.

One year follow-up

At follow-up 1 year after the manual manipulation (36 months after onset) the patient was pain free and had ceased all medication. There was no swelling over her acromioclavicular joint or mm. scalenii, and she had no adverse sensations in her right arm. Her movements were unrestricted and she did not suffer from any sleeping disorders.

DISCUSSION

This is a case study of a 29-year-old woman with a diagnosed AC. After medication, sick leave, steroid injection, radiography and physiotherapy in primary care, with no change in symptoms, she was referred to an orthopaedist. At the orthopaedic outpatient department manipulation of the GHJ under anaesthesia was performed, followed by additional physiotherapy and medication, after which the patient's mobility improved, but not her pain or sleeping disorders. One year later the patient's condition was unchanged, which is why she had naprapathic manual therapy. After manual manipulation of the acromioclavicular joint on the affected side, there were significant improvements in pain, mobility and sleeping disorders, and the patient

Table 1 Outcomes of conventional and specialised manual treatment, respectively, at follow-up after 12, 24, 52, 55 and 107 weeks

	At baseline in the RCT† (11 months after onset)	12 Weeks after baseline in the RCT 8 Weeks after manipulation under anaesthesia	24 Weeks after baseline in the RCT 20 Weeks after manipulation under anaesthesia	52 Weeks after baseline in the RCT 48 Weeks after manipulation under anaesthesia	55 Weeks after baseline in the RCT 1 Week after manual manipulation	107 Weeks after baseline in the RCT 52 Weeks after manual manipulation
VAS* (the worst pain) (mm)	100	99	99	74	25	3
SF36; bodily pain†	Very severe	Very severe	Severe	Severe	A little pain	No pain
SF36; restricted physical function	Very much	Much	Very much	Much	No restriction	No restriction
ROM§; elevation	15°	80°	80°	70°	Unrestricted	Unrestricted
external rotation	30°	50°	—	40°	—	—
Perceived recovery	—	Unchanged	Slightly better	Unchanged	Much better	Much better
Medication	NSAID‡, sleeping pills	NSAID, sleeping pills, Gabapentin, Hexal	NSAID, sleeping pills, Gabapentin Hexal (increased intake)	NSAID, sleeping pills, Gabapentin Hexal	Gabapentin Hexal (decreased intake)	None
Sleep	4 h sleep per night	4 h sleep per night	4 h sleep per night	4 h sleep per night	No sleep disturbances	No sleep disturbances

‡NSAID, non-steroidal anti-inflammatory drug; †RCT, randomised controlled trial; §ROM, range of motion; *VAS, visual analogue scale.

ceased all medication. The improvement at follow-up 1 year later was even better.

Literature review: aetiology and former studies

The aetiology of AC is unclear. In the first publication of the condition, in 1872, it was described as a scapulohumeral periartthritis causing stiffness around the shoulder joint.⁴

To date, a very small number of studies take notice of the acromioclavicular joint, thus focusing on the pain, and not on any treatment of that joint, but on the GHJ.^{5 13 14} Only in one previously published case study was manual manipulation of the GHJ following a failed surgical intervention (arthroscopic capsular release) described.¹⁵ To the best of our knowledge no reports exist where manual manipulation has been performed following manipulation under anaesthesia.

There are similarities with a few (5) previously published case studies in that the pain duration in those studies varies from 3 to 12 months, and the follow-up period from 6–8 weeks to 2 years, and in the majority of the studies, the patients had undergone physiotherapy before the studies were performed.^{13 15–18} Also, in all four studies containing treatment, there were significant changes in pain, mobility and physical function. The treatment in those studies consisted of translational manipulation, combined with Interscalene block, end-range mobilisation techniques, Maitland mobilisation, ‘exercises’ and mobilisation, and ‘manually adjusted force short level chiropractic adjustment’, respectively. The most salient difference in the treatment modalities compared with the present study is the treatment technique; former studies have used different mobilisation techniques, whereas in our study a high velocity manipulation technique was performed. Also, in former studies the treatment was focused on the GHJ, whereas in ours the focus was the acromioclavicular joint. The treatment duration and the amount of treatment sessions also varied (from 5 sessions for 2 weeks in the present study, compared with between 18 and 35 sessions for 12–17 weeks in previously published studies). Thus, the number of treatment sessions and their duration, as well as the cost of treatment, were much lower for the treatment described in this study, which is an

additional advantage. However, even though only during the manual manipulation, and for a couple of hours after the same, was this treatment painful for the patient, it should maybe have been performed under anaesthesia. In one former case study a treatment plan for AC is presented, yet without any evaluation.

The origin of the pain in patients with AC may be difficult to localise; it is usually the deltoid and/or the anterior or posterior part of the glenohumeral capsule, sometimes radiating to the biceps tendon.^{6–8 19} Thus, the origin for some AC may be the acromioclavicular joint, not the GHJ, and some manipulations or mobilisations of the GHJ may also affect the mobility of the acromioclavicular joint, whereas other manipulations do not. It may be that this joint is manipulated simultaneously but unintentionally, when manipulating the GHJ.

Strengths and weaknesses

The patient in the present study was included in a randomised controlled trial and in a recently published cost consequence analysis. Therefore her pain, physical function, medication,

Patient's perspective

I have been willing to cooperate and to contribute information about my condition, as it might be of help to other patients suffering from the same condition. If there is any way that others may be helped, it is worthwhile. Although physiotherapy did not render any distinct improvement, I was happy to have been supported by my physiotherapist, with discussions about how to move on (radiography, referral to the orthopaedist, other kinds of exercises, and changing jobs, etc). I have been ‘the good patient’, who always performs her homework and seldom complains. My physiotherapist did not realise that I was in such pain, since I seldom complained. But why should I? I wonder why it had to take 2 years to be cured, when—actually—there was a method that worked. Why was this not offered to me before?

sleep pattern, perceived recovery and the costs were measured for almost 3 years, using the SF 36 survey, which is a strength. We find this case study interesting and important, as it strives to find new ways to explain and to treat AC. A weakness in our study is that the manual manipulation was painful for the patient and should have been performed under anaesthesia. Large pragmatic randomised trials including manual treatment for AC, with overall comparisons of cost-effectiveness, are warranted.

Learning points

- For this case of adhesive capsulitis (AC), manual manipulation of the acromioclavicular joint successfully improved the symptoms. Given the lack of clarity on the aetiology and the lack of evidence for the treatment and cost-effectiveness of existing conventional treatments, the following should be considered:
 - There does not necessarily have to be any 'preceding trauma' in patients who suffer from AC.
 - Some cases of AC may be a dysfunction of the acromioclavicular joint, not the glenohumeral joint.
 - In order to speed up the recovery process, and to reduce costs, specialised manual examination of patients with AC should be considered early in the healthcare chain.
 - Cooperation between orthopaedic surgeons and specialists in manual therapy should be considered in patients with suspected or diagnosed AC, in order to reduce the pain when performing manual manipulation.

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