



How to treat a frozen shoulder ? A survey among shoulder specialists in the Netherlands and Belgium

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A frozen shoulder is a common cause of a painful and stiff shoulder. A web-based survey was conducted to obtain insight in the current preferences about the diagnosis and treatment of a frozen shoulder. A response rate of 54% was reached among shoulder specialized orthopaedic surgeons from the Netherlands and Belgium. Non-steroidal anti-inflammatory drugs and intra-articular corticosteroid injections are used frequently in the first phase of the condition. Physiotherapy is assumed to be more important in the final phase. The results of the survey indicate a wide variety of treatment strategies in the different phases of a frozen shoulder. Three out of four respondents considered that the management of a frozen shoulder could benefit from a written guideline. The development of a written guideline should lead to an improved level of consensus and a more standardized approach in the treatment of a frozen shoulder among shoulder specialists in the Netherlands and Belgium.

Keywords : shoulder ; frozen ; rehabilitation ; manipulation ; arthroscopy.

INTRODUCTION

A frozen shoulder (adhesive capsulitis) is a common cause of shoulder pain and affects approximately 2-5% of the general population (22,23). An idiopathic frozen shoulder is characterised by a spontaneous onset of pain and stiffness of the shoulder, especially a loss in external rotation, without a

prior traumatic event (18). The condition is traditionally divided in three phases (17). A freezing phase with severe pain and increasing stiffness, a frozen phase with established stiffness but reduced pain. And a third, gradual improvement of motion occurs in the thawing phase. The peak incidence is between the fifth and sixth decade, slightly more frequent in women than in men. The most important associated systemic condition is diabetes mellitus (25,26). Although it is a condition that is described as self-limiting (17), restriction of shoulder movement can persist eventually (21).

Frozen shoulder is a well-known clinical entity among orthopaedic surgeons, and also frequently encountered by general practitioners and physiotherapists. There are still many controversies

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existing about the definition, the different phases and the optimal treatment regimen. There are many different treatments available, e.g. supervised neglect (4), non-steroidal anti-inflammatory drugs (NSAIDs), physiotherapy (5,20), corticosteroid infiltration (3), manipulation under anaesthesia (10), arthroscopic capsular release (1), arthrographic capsular distension (2) and stretching devices (8). However, systematic reviews point to a lack of scientific evidence to recommend any specific treatment regimen (12,19). What we do know, is that non-operative treatment is sufficient for most cases, and recovery takes place in two years on average (18). Consequently, intra-articular corticosteroid injections and physiotherapy are among the most widely used treatment modalities described in the treatment of a frozen shoulder, in both primary and secondary healthcare settings (12,24). However, there seems to be no general consensus on the conservative treatment of a frozen shoulder among shoulder specialists. In addition, there is no national guideline for orthopaedic surgeons nor physiotherapists in the Netherlands or Belgium to guide the treatment of a frozen shoulder. This can lead to significant differences in management strategies between regions, hospitals and even between individual orthopaedic surgeons within one hospital. In order to gain insight into the current opinions and preferences about the diagnosis and treatment of a frozen shoulder, a web-based questionnaire was developed for Dutch and Belgian orthopaedic surgeons with a special interest in shoulder pathology.

MATERIALS AND METHODS

A web-based questionnaire was developed by the authors, consisting of 26 questions (7 introduction questions, 3 questions about the physical examination, 4 about the diagnosis and 12 about the treatment). All orthopaedic surgeons, member of the Dutch Shoulder and Elbow Society and the Belgian Elbow and Shoulder Society were invited to fill out the questionnaire. Permission was obtained from the boards of both societies to contact the members of the associations by email. A reminder email was sent after two weeks. The survey was kept open for six weeks. Data was analysed using Statistical Package for the Social Sciences version 21.0 (IBM SPSS, Chicago, IL, USA).

RESULTS

General questions

Out of the 186 invitations sent, a number of 100 (54%) were returned. The response rate from the Dutch Shoulder and Elbow Society was 62% and from the Belgian Elbow and Shoulder Society 44%. One respondent was excluded from the analysis due to exceptional high numbers to several questions in which estimated numbers were asked. Due to the anonymity of the study, it could not be verified if these answers were realistic. Ninety-five percent of the responders works as a staff member and about half (52%) has more than ten years of experience in treating shoulder problems. More than half of the responders (60%) are currently working in a teaching hospital. The mean estimated number of patients treated with a frozen shoulder in one month was 11 (95% CI 10-13) per shoulder specialist.

Diagnosis and Examination

Eighty-eight percent of the respondents agreed on the widely used definition for frozen shoulder coined by Zuckerman : “Frozen shoulder is a condition characterized by functional restriction of both active and passive shoulder motion for which radiographs of the glenohumeral joint are essentially unremarkable except for the possible presence of osteopenia or calcific tendonitis” (27).

There is large agreement among the surveyed orthopaedic surgeons about the most severely restricted motion in patients with a frozen shoulder. External rotation was chosen by 80%, followed by internal rotation by 14%. The range of motion of the shoulder joint was recorded in clinical practice by estimation (‘eyeballing’) by 90% of the respondents, and only 6% used a goniometer with physical examination. A conventional X-ray of the shoulder was used by 90% to rule out other possible causes for shoulder pain and stiffness. Ultrasound examination of the shoulder was recommended in the work up of shoulder pain and stiffness by 34% of the respondents. For MRI this was recommended by 2% only. Eighty-four percent of the responders

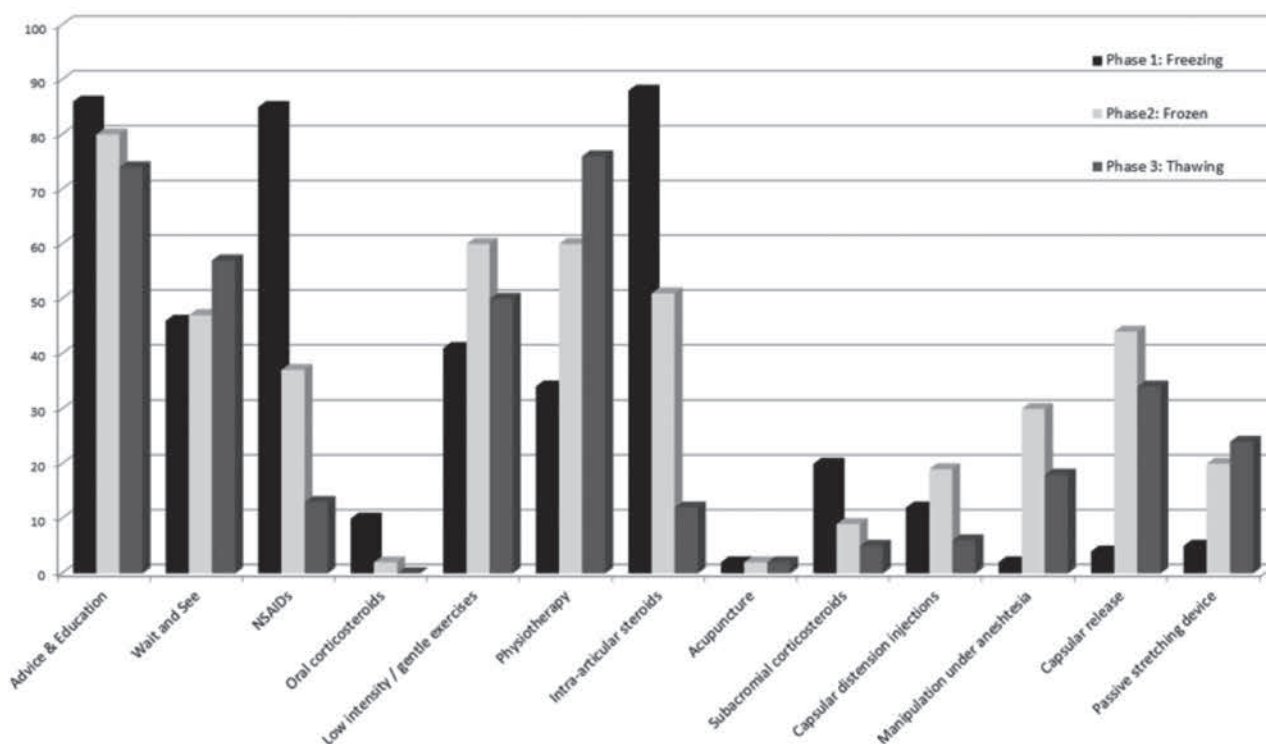


Fig. 1. — Frequency histogram of treatment modalities considered appropriate in the different phases of a frozen shoulder.
 X-axis : Treatment modalities.
 Y-axis : percentage of respondents that considered the treatment modality appropriate.
 (NSAIDs = Non-Steroidal Anti-inflammatory drugs).

considered it useful for clinical purposes to identify the phase of the condition.

Treatment

Only 37% of the orthopaedic surgeons indicated that there is a written protocol available in their clinical practice for the treatment of a frozen shoulder. However, three out of four (75%) considered that the management of a frozen shoulder could benefit from a nationwide written protocol.

Figure 1 shows which treatment modalities were considered appropriate for a typical primary frozen shoulder, specified to the different phases. The only obvious agreement between the respondents (> 80%) was on advice and education, NSAID usage, and intra-articular corticosteroid injection in the first phase of the condition. Figure 2 shows a graph with

the appropriateness of the many physiotherapy modalities for the different phases of frozen shoulder. Nearly all physiotherapy modalities were considered to be most appropriate in phase 3.

When referring patients with a frozen shoulder to a physiotherapist, 69% of the orthopaedic surgeons indicate that they preferred a specialized shoulder therapist. Sixty-four percent assumed it is important to specify the phase of the condition when referring to a shoulder therapist. Only 19% declared that they do not specify any treatment modality, when referring.

Twenty four percent of the orthopaedic surgeons do not use arthroscopic capsular release for frozen shoulders. For the 76% of the orthopaedic surgeons that do perform arthroscopic capsular release, the median number of releases per year is 3 (range 1-50). Manipulation under anaesthesia is done by

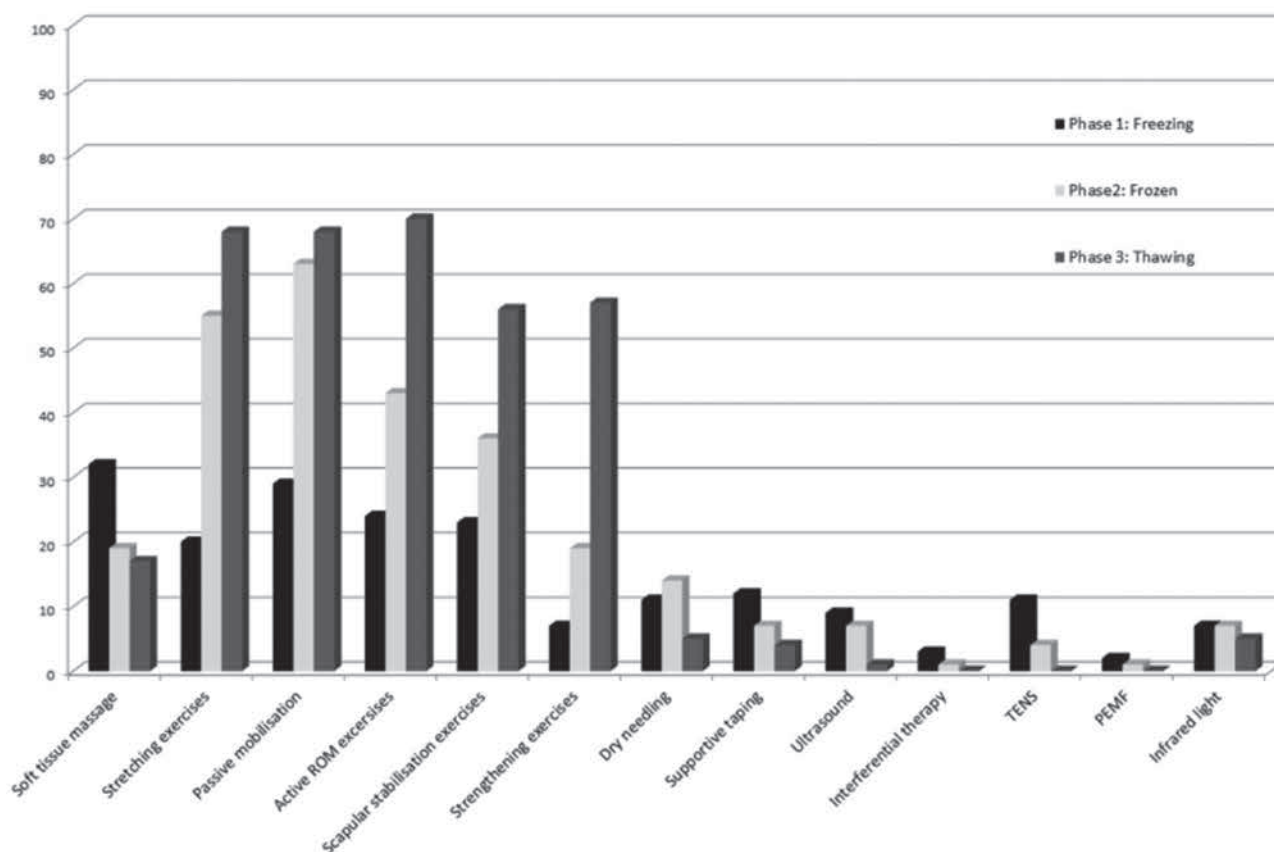


Fig. 2. — Frequency histogram of physiotherapy modalities considered appropriate in the different phases of a frozen shoulder. X-axis : Treatment modalities.

Y-axis : percentage of respondents that considered the treatment modality appropriate.

(ROM = Range of Motion, TENS = Transcutaneous Electric Nerve Stimulation, PEMF = Pulsed ElectroMagnetic Field therapy).

43% of the orthopaedic surgeons. For these surgeons the median number of manipulations per year is 5 (range 1-50).

DISCUSSION

This online survey on the diagnosis and management of frozen shoulder was completed by a large number of experienced orthopaedic surgeons from the Netherlands and Belgium, all of them with a special interest in the shoulder joint. Although a web-based survey provides limited evidence (level IV), it is a time-efficient method to collect information on a clinical topic and its current clinical practice. A response rate of 54 % was in line with other web-based surveys among orthopaedic sur-

geons (11,16). This response rate may yield a representative overview of the individual preferences and current clinical practice in the Netherlands and Belgium.

Eighty-eight percent agreed on the widely used definition by Zuckerman, which is comparable to the 82% agreement in the original article (27). However, this broad definition is only descriptive for a frozen shoulder in general. We did not propose a new definition for the clinical diagnosis of frozen shoulder as strict cut-off values for the duration of the pain, or the amount of restriction, vary among the many reports. But in order to use future research for clinical purposes, it seems sensible to use narrower diagnostic criteria. By means of this, a specific study population is delimited and

distinction is made with various other causes of shoulder pain.

Similar to what is known from previous studies, external rotation was considered to be the most severely restricted range of motion (18). Although the use of a goniometer to measure the range of motion is encouraged in the literature (13), this survey illustrates that in clinical practice only a minority actually does use a goniometer. For the diagnosis of a frozen shoulder, the true amount of restriction in degrees is probably not crucial to determine. However, 'eyeballing' might not be accurate enough to detect the differences in joint motion throughout the follow up.

In accordance with the current literature, the survey seems to confirm that NSAIDs and intra-articular corticosteroids are assumed important early on in the treatment (7). The benefit of physiotherapy is assumed to be more important later on in the condition. Not one specific physiotherapy treatment is preferred by more than 35% of the orthopaedic surgeons in phase one of a frozen shoulder. Stretching, passive mobilisation, and range of motion exercises are generally preferred by the majority of the orthopaedic surgeons in phase three. There is no strong evidence to establish in which phase physiotherapy is most effective, although it is often recommended to respect the threshold of pain. Vigorous exercises or manipulations in the early painful phase might delay recovery (15). This does match with recent guidelines of the American Physical Therapy Association (9). In this article, the content and intensity of the physiotherapy program is guided by a stratification in tissue irritability level of the shoulder. The most ambiguity is observed in phase two of the condition, where a lot of treatment modalities are preferred by about 50% of the respondents. This signifies disagreement among treating physicians, which is very likely caused by a lack of evidence that is also pointed out in recent reviews (12,14,15). Another possible explanation is that the natural course of the condition (seemingly gradual improvement) can mimic a relative similar positive effect of various different treatment modalities.

According to the participating orthopaedic surgeons, there is no role for passive physical treatment modalities including ultrasound treatment, in-

terferential therapy, transcutaneous electrical nerve stimulation, pulsed electromagnetic field and infrared light, in the treatment of a frozen shoulder. In addition, the literature has shown a clear lack of efficacy of these treatment modalities (6,12,19).

This survey does have some limitations. In general, the wide variation in treatment preferences for a frozen shoulder are not surprising. This is presumably caused by a lack of high level evidence. However, the confirmation hereof in this survey points out the necessity for better evidence and more uniformity. In a number of questions, the preferred treatment modality was asked for the three different phases of a frozen shoulder. We did not clearly specify the different phases of a frozen shoulder as no precise definitions are available to date. Therefore, this was up to the interpretation of the participating orthopaedic surgeon, similar to current practice. We do think that a written guideline should provide precise diagnostic criteria and that treatment recommendations must be specified for the different phases of a frozen shoulder.

No questions were asked whether orthopaedic surgeons evaluated the effectiveness of their treatment. Recent guidelines that were developed in the Netherlands for other subjects (such as for subacromial pain), do provide recommendations for outcome measuring instruments (such as the Shoulder Pain and Disability Index, or the Dutch Oxford Shoulder Score (28). The Dutch Orthopaedic Association also stimulates the use of patient reported outcome measures (PROMs). It could have been interesting to know whether orthopaedic surgeons actually use these outcome measures, or which outcome instrument is considered to be the most valuable for the treatment of a frozen shoulder.

Another weakness of this study is that it evaluates which treatment modality is theoretically considered to be the most appropriate. But this does not necessarily correspond to clinical practice. In our opinion this specifically holds true for physiotherapy treatment, which is probably influenced by reimbursement modalities. In recent years, health-care cuts have led to the fact that many patients are not reimbursed for physiotherapy treatment. This obviously leads to a lower compliance rate for this treatment modality.

The variation in clinical practice shown in the current survey could be an underestimation because of a pre-selection of orthopaedic surgeons with interest in shoulder pathology. As in every survey, non-response bias can not be ruled out. Cold or cryotherapy was suggested by a few respondents who advised it to use for pain reduction in the freezing or frozen phase. This treatment modality was not included in the survey. It could have been interesting to know the individual decision rules for a more invasive intervention, being manipulation or arthroscopic release, because strict criteria are not available for these indications. However, this was not the focus of this survey.

CONCLUSION

Frozen shoulder is an important cause for shoulder pain and stiffness. However, there seems to be no clear consensus on the diagnosis and treatment. This survey gives insight in the current preferences of Dutch and Belgian shoulder specialized orthopaedic surgeons in the treatment of a frozen shoulder. There was a high degree of agreement on the proposed descriptive definition of the clinical entity of frozen shoulder. A wide variety of preferences for different treatment modalities was demonstrated in the different phases of frozen shoulder. This could be due to a lack of evidence or the relatively similar effectiveness of all the different treatment modalities available. Secondly, there is no written guideline for the frozen shoulder for orthopaedic surgeons or physical therapists in the Netherlands and Belgium. Many surgeons reckon that the treatment of a frozen shoulder could benefit from such a written guideline. This guideline ideally consists of a classification system to guide treatment and should aim for more uniformity in treatment strategies for frozen shoulder in general. Also, it is clear that more research needs to be done on the effectiveness of the different treatment strategies for frozen shoulders to improve outcome.

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