ORIGINAL ARTICLE

The Effects of Scapulothoracic Bursa Injections in Patients With Scapular Pain: A Pilot Study

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ABSTRACT. Chang WH, Im SH, Ryu JA, Lee SC, Kim JS. The effects of scapulothoracic bursa injections in patients with scapular pain: a pilot study. Arch Phys Med Rehabil 2009;90: 279-84.

Objective: To assess the effects of steroid plus hyaluronate injections for scapulothoracic bursitis in patients with scapular pain.

Design: Prospective open-label unicenter trial with a 3-month follow-up.

Setting: University rehabilitation hospital.

Participants: Twenty-two cases of suspected scapulothoracic bursitis.

Intervention: Injections into scapulothoracic bursa were performed with steroid plus hyaluronate. Injections were administered once a week for 3 weeks.

Main Outcome Measures: Visual analog scale (VAS), Rubin scale, adverse events, and injection-associated complications.

Results: Mean outcome scores at 3-month follow-up visits showed significant improvements versus baseline (mean VAS increased from 7.8 to 2.2) ($P<.05$). Furthermore, mean VAS scores at 1, 2, and 3 weeks after treatment commencement showed significant improvements versus baseline ($P<.05$). No serious complication occurred during the study.

Conclusions: Scapulothoracic bursitis should be considered when treating patients with perimarginal scapular pain or subscapular pain. Our findings show that steroid plus hyaluronate injections into the scapulothoracic bursa provide an effective means of treating patients with scapulothoracic bursitis.

Key Words: Hyaluronic acid; Injections; Rehabilitation; Scapula.

NONSPECIFIC COMPLAINTS OF PAIN under the scapula are commonly encountered, and may originate from any disorder of the cervical spine or glenohumeral joint. However, in many cases, pain is not related to these structures, and in these cases, additional clinical studies are required to reveal possible causes of pain and to confirm the beneficial effect of treatment.

The scapula is a large triangular bone situated on the posterior thorax. Furthermore, the pseudojoint between the scapula and the thorax is one of the least congruent in the human body. Moreover, because there is no true bony attachment between the scapula and the axial skeleton, its stability is afforded mainly by the surrounding musculature.[1] The subscapularis and serratus anterior muscles lie interposed between the scapula and the thoracic wall, and help stabilize the scapula against the chest wall and thus prevent scapular winging.[2] In addition, soft tissues, such as muscle tendons and bursae, are located between the bony thorax and the scapula, and several bursae that lie in or around the scapulothoracic joint can cause scapular dysfunction and crepitus.[3] The largest bursa, which may be the main source of scapular pain, lies between the serratus anterior and the chest wall.[4]

Nicholson and Duckworth,[5] based on their operative findings and recent descriptions of bursal anatomy, suggested that injections into the scapulothoracic bursa should be considered for diagnostic and therapeutic purposes—that is, in cases of painful scapular crepitus unresponsive to conservative management. Based on their study and the scapular anatomy, we hypothesized that periscapular or subscapular pain of indeterminate cause is, in many cases, likely to originate from a scapulothoracic bursa. It has been suggested that the etiology of bursitis involves a loss of the normal gliding movement of the scapula, which causes the superior angle of the scapula to tilt forward and irritate the underlying scapulothoracic bursa, which is then compressed between the scapula and the ribs.[6] We assumed that pain or tenderness at the periscapular margin originates from a scapulothoracic bursa, because the scapulothoracic bursa cannot be palpitated directly. In the present study, we undertook to devise a less invasive, safer, injection-based method for the diagnosis and management of STB.

Thus, we administered scapulothoracic bursal injections of steroid plus HA in the belief that this combination might reduce the pain caused by bursitis; the analgesic effects of steroids are probably related to their anti-inflammatory effects.[7] Nevertheless, high-molecular-weight HA has been found to be effective at treating subacromial bursitis of the shoulder,[8] and is thought to act as a lubricant and to have protective effects—for example, to maintain tissue structure and inhibit neovascularization—in addition to its anti-inflammatory effect.[8] Here, we describe our experiences of 22 cases of STB.

METHODS

Participants

Patients determined to have suspected STB based on clinical examinations were included. All patients met the

List of Abbreviations

HA	hyaluronic acid
STB	scapulothoracic bursitis
VAS	visual analog scale

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No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit on the authors or on any organization with which the authors are associated.

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0003-9993/09/9002-00369$36.00/0
doi:10.1016/j.apmr.2008.07.027

following inclusion criteria: (1) a nonspecific complaint of pain under the scapula; (2) pain at the medial border of the scapula; (3) extreme tenderness at the superior angle and medial border of the scapula; and (4) a main complaint of scapular pain in cases with scapular pain combined with cervical or shoulder pain. Only patients with disabling pain were included; patients with scapular snapping but with no or mild pain were excluded. A radiograph of the scapula taken at the time of screening was used to identify and exclude cases of fracture or osteonecrosis. Candidates with pain in bilateral scapulae were also excluded in order to allow pain improvements to be investigated better. In addition, patients with absolute contraindications for the injection procedure, such as local infection, dermatologic conditions that precluded adequate skin preparation, a tumor at the injection site, a history of allergy to local anesthetic agents, severe hypovolemia, gross coagulation defects, and septicemia, were also excluded. Thirteen patients who met these inclusion criteria had visited another hospital previously and had undergone different conservative treatments—that is, 5 had received a series of trigger point injections in and around muscles of the scapula, 9 had undergone physiotherapy such as superficial heat and deep heat, and 11 patients had been administered oral medications. However, none of these treatments resulted in noticeable pain improvement.

Twenty-two (6 men and 16 women) of these 24 patients provided informed consent, completed the treatment schedule, and attended a 3-month follow-up after the first injection. Five patients had a history of a direct shoulder contusion caused by a traffic accident, but the other 17 had no trauma or surgical history related to the shoulder girdle.

All patients provided written informed consent and were provided an explanation of the study goals. All procedures were approved by the institutional ethics committee. In addition, it should be noted that HA administration as presented in this study constitutes off-label use.

Injection Procedure

With the affected arm in a position of extension, internal rotation, and adduction, with the patient laying prone and attempting to reach the upper spine—that is, similar to the surgical "chicken wing" position (fig 1)—bony landmarks used for orientation in the large scapulothoracic space and serratus anterior bursa are absent. Therefore, as suggested by Ruland et al[4] and to avoid touching main neurovascular structures, we inserted the injection needle via a portal midway between the spine of the scapula and the inferior angle of the scapula and 3 to 4 fingerbreadths from the vertebral border of the scapula (fig 2). Portal placement near the vertebral border of the scapula should be avoided because it requires a more vertical spinal needle orientation, which increases the likelihood of penetrating the thoracic cavity and injuring the dorsal scapular artery and nerve.[4] This portal courses through subcutaneous tissue, the trapezius, and the interval between the rhomboid major and minor muscles before penetrating the serratus anterior space. Accordingly, needles were inserted into the primary target—that is, the bursa between the serratus anterior and the lateral chest wall. The 22 patients were injected with 40mg triamcinolone containing 4mL 0.5% lidocaine followed by 20mg high-molecular-weight HA (2mL, 1% hyaluronan, molecular weight 940–1020kd).[a] The doses injected were arbitrary, because no guideline has been established. These injections into the scapulothoracic bursa were administered once weekly for 3 weeks. During this period, patients were allowed to take previously prescribed oral medications, such as nonsteroidal anti-inflammatory drugs and muscle relaxants, but were not permitted any physical therapy or new medication.

Fig 1. Position adopted for scapulothoracic bursa injections; the patient was asked to try to reach the high spine with the affected arm while lying prone to place the arm in an extended, internally rotated, adducted position.

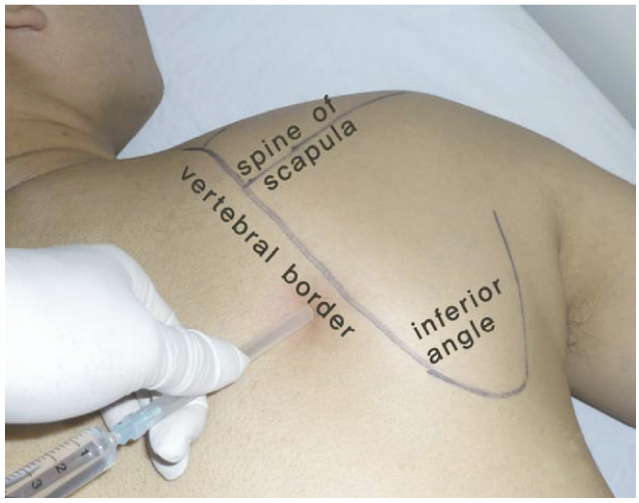

Fig 2. Needle placement: visualization portal was placed midway between the spine of the scapula and the inferior angle of the scapula (a 6-cm spinal needle was used).

Evaluation Method

This pilot study was a prospective, open-label, unicenter study. Before study commencement, sex, age, affected side, symptom duration, and prior treatment were documented. A VAS (range, 0–10)[9] and the Rubin scale[10] were used to assess pain and to determine treatment success rates, respectively. Response to treatment was recorded as follows: (1) poor—no relief; (2) fair—mild, intermittent pain; (3) good—mild, intermittent discomfort without pain; and (4) excellent—complete relief of pain. Baseline measurements were taken before first injections, and other measurements just before subsequent injections. Therefore, patients were examined at the following times: at baseline, and then at 1, 2, and 3 weeks after the first injections, and again at 3 months after the first injections.