

J Shoulder Elbow Surg. 1996 Jan-Feb;5(1):62-8.

The efficacy of cryotherapy in the postoperative shoulder.

Speer KP¹, Warren RF, Horowitz L.

Author information

Abstract

We report the results of an outcome study that used visual analog scales to evaluate the efficacy of cryotherapy in the postoperative shoulder. This prospective study included 50 consecutive patients admitted to the hospital for at least one night after anterior shoulder stabilization, rotator cuff repair, or total shoulder replacement. The patients were randomized: 25 were fitted with a cryotherapy device in the operating room, and 25 were not. Otherwise, postoperative treatment was identical for the two groups, including types of analgesic agents given. Visual analog responses were converted to numeric values by simple measurement techniques. The scales assessed pain, comfort, sleep, analgesic use, and overall satisfaction. On the night of the operation the pain was less severe and occurred less often in the cryotherapy group. Those in the cryotherapy group slept better on the night of the operation and perceived the need to use pain medicine less often in comparison with those in the noncryotherapy group. By postoperative day 10 patients in the cryotherapy group reported their shoulders hurt less often and with less severity. Swelling was less, and shoulder movement hurt less during rehabilitation, enhancing the rehabilitative effort. Cryotherapy offers a number of benefits for care of patients in the immediate postoperative period.

PMID: 8919444 [PubMed - indexed for MEDLINE]

J Shoulder Elbow Surg. 2001 Nov-Dec;10(6):522-5.

The efficacy of continuous cryotherapy on the postoperative shoulder: a prospective, randomized investigation.

Singh H¹, Osbahr DC, Holovacs TF, Cawley PW, Speer KP.

Author information

Abstract

This prospective, randomized investigation evaluated the efficacy of cryotherapy on subjective responses after both open and arthroscopic

procedures on the shoulder. Seventy patients were randomly assigned to one of two study groups: (1) continuous cryotherapy group and (2) age-matched control group. Visual analog scales were used to assess subjective responses on postoperative days 1, 7, 14, and 21. On day 1, patients receiving cryotherapy reported significantly less pain during sleep and significantly more comfort in bed and rated their sleep as more restful than the control subjects. During days 7 through 21, cryotherapy subjects reported a significant reduction in frequency and intensity of pain, as well as less pain during shoulder rehabilitation, than the control subjects. These results indicate that cryotherapy is an effective method for postoperative pain control because it decreases the severity and frequency of pain and allows a return to normal sleep patterns while increasing overall postoperative comfort and satisfaction.

PMID: 11743529 [PubMed - indexed for MEDLINE]

Arthroscopy. 2002 Sep;18(7):748-54.

The effect of continuous cryotherapy on glenohumeral joint and subacromial space temperatures in the postoperative shoulder.

Osbahr DC¹, Cawley PW, Speer KP.

Author information

Abstract

PURPOSE:

The objective of this investigation was to determine the effect of continuous cryotherapy on glenohumeral joint and subacromial space temperatures in the postoperative shoulder.

TYPE OF STUDY:

Prospective, randomized, and controlled clinical trial.

METHODS:

Twenty patients (10 cryotherapy, 10 controls) with a full-thickness rotator cuff repair were monitored with temperature sensors in the glenohumeral joint and subacromial space of the shoulder for 23 postoperative hours. Statistical analysis ($P < .05$) was performed using the Mann-Whitney rank-sum test.

RESULTS:

In comparing the cryotherapy and control groups, analysis of the glenohumeral joint and subacromial space temperatures revealed a statistical significance at 4, 8, and 23, and 4, 8, 16, and 20 postoperative hours, respectively. In addition, a trend toward a temperature-rising phase occurs from 4 to 12 hours and is followed by a trend toward a thermostatic

phase from 12 to 23 hours during which temperatures remain relatively constant. The subacromial space was consistently cooler than the glenohumeral joint by an interval between 0.07 degrees C to 0.50 degrees C except at 23 hours postoperative where the glenohumeral joint was 0.05 degrees C cooler.

CONCLUSIONS:

Continuous cryotherapy causes a statistically significant reduction of both glenohumeral joint and subacromial space temperatures in the shoulder at variable times during the first 23 postoperative hours. Previous investigations have shown that minor elevations in intra-articular temperature can stimulate proteolytic enzyme activity, which has detrimental effects on articular cartilage. Previous research has also shown that cryotherapy is an effective nonpharmacological method of pain control. Yet the literature has assumed that the effects of cryotherapy are part of the basic analgesia mechanism because of a reduction in joint temperature. Our results affirm that reductions in glenohumeral joint and subacromial space temperatures in the postoperative shoulder do occur, leading to potential benefits of continuous cryotherapy as an effective mode of pain control in the postoperative care of patients.

PMID: 12209433 [PubMed - indexed for MEDLINE]

Arthroscopy. 1997 Aug;13(4):461-4.

Penetration of cryotherapy in treatment after shoulder arthroscopy.

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Author information

Abstract

Fifteen patients undergoing shoulder arthroscopy had indwelling temperature probes placed in the glenohumeral and subacromial spaces. All shoulders underwent diagnostic arthroscopy and debridement of the subacromial space. Cryotherapy was delivered to the shoulder via a Cryo/Cuff (AirCast, Summit, NJ) and temperatures were monitored for 90 minutes. Ten shoulders received cryotherapy and 5 were used as controls. Before cryotherapy, temperature averaged 34 degrees C in the glenohumeral joint and 31 degrees C in the subacromial space. No significant difference was seen between the temperatures recorded in the cold therapy and control groups for either the glenohumeral or subacromial space. In all cases, the subacromial space averaged 1 degree cooler than the glenohumeral joint at the conclusions of arthroscopy. These slowly equalized to an average of 35 degrees postoperatively. The present study

shows that surface-applied cryotherapy does not penetrate either the glenohumeral joint or the subacromial space. Attention must be turned elsewhere to delineate how cryotherapy works.

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