

Pain management therapies for shoulder pain



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Background

Miguel is an 11 year old baseball player who began experiencing shoulder pain in his pitching arm. He was the only pitcher on his team last season and does not want the shoulder pain to interfere with his performance this season. He is experiencing tingling down his arm and a decrease in range of motion (ROM). His mother wants to have her son receive steroid injections so nothing gets in the way of his future in the MLB and the Miguel wants to undergo Tommy John's surgery to decrease the pain and help his with his pitching.

Goals

Miguel's main goal is to decrease his pain, increase his range of motion and eliminate the tingling in his arm so he can pitch in the upcoming baseball season. He hopes to get back to pre-exacerbation status and pitch at full strength.

Biases

Miguel came into the office wanting surgery so might not be compliant with at home exercises and stretches which were given to him to enhance the effectiveness of the treatment he was receiving at the chiropractic office. Miguel's mom wants to give her son steroid injections to get him healthy and ready for the upcoming season and wants to make sure nothing gets in the way of him making it into the MLB.

Concerns

Miguel is concerned that the pain will not go away and any treatment, besides the surgery, will be a waste of time making him unable to pitch this season. He is also worried that because of the setback, he will not make it back to full strength and in turn will not make it into the major baseball league.

Expectations

Miguel is expecting diagnostic imaging to be done to diagnose if he has a tear of his rotator cuff or if he has a sprain/strain of his rotator cuff. Miguel is also expecting spinal manipulation of the cervical and thoracic spine to help with the tingling throughout his arm and Active Release Technique (ART) to his upper trapezius, pectoralis major, and subscapularis muscle.

Limitations

Miguel and his mother want immediate treatment that will allow Miguel to play in the upcoming baseball season. As a chiropractor, a holistic approach to healing will be utilized, which will not have the immediate results desired by the patient and his family.

PICO(T)

Does active release therapy (used on patients to break up adhesions and scar tissue) in combination with upper spinal manipulation improve shoulder function and decrease pain in adolescent athletes better than wait-and-see protocols?

Population: Adolescent athletes with shoulder pain

Intervention: Active release technique with cervical and thoracic spinal manipulation

Comparison: Wait and see

Outcome: Decrease in pain based on a numerical pain scale (1-10; 10 being the worst) and increase of range of motion measures by a goniometer

Time: Twice a week for 8 weeks

Does at home strengthening exercises and stretches along with rest improve function and decrease pain in adolescent athletes better than wait-and-see protocols?

Population: Adolescent athletes with shoulder pain

Intervention: Rest and education of at home stretches and strengthening exercises

Comparison: Wait and see

Outcome: Decrease in pain based on a numerical pain scale and increase of range of motion measured by a goniometer

1. Manipulative Therapy in Addition to Usual Medical Care for Patients with Shoulder Dysfunction and Pain: A Randomized, Controlled Trial By: Bergman et al. (2004)

MeSH Terms: Pain Management, Manipulative Therapy, Shoulder, Medical disorders, Medical Treatment

Summary: Manipulative therapy in conjunction with usual care for shoulder pain and weakness increased recovery time and allowed patients to get back to their daily activities sooner than if they were not to receive any spinal manipulation.

Overall, this study was high quality and had little room for bias and weaknesses. However, one weakness of this study was the population size. The population size was 150 patients who were experiencing pain and dysfunction of the shoulder girdle. The researchers had hoped for a sample size almost twice as large to increase the statistical significance. Another weakness was the time factor. Patients reported that the pain would get in the way of them completing their activities of daily living and although in the end they saw positive results, they wish it had come sooner. Lastly, manipulative therapy for treatment of shoulder pain is rarely studied and although this study yielded significant results, it would be beneficial for researches to conduct further research to ensure these results can be replicated and applied as a viable treatment option. A major strength of this study is that at week 12, a statistically significant sample of patients from the intervention group reported they were fully recovered or had notable improvement compared to the patients in the control group. This implies that standard care coupled with spinal manipulation helped greatly improve or eliminate shoulder pain symptoms, faster than just receiving standard care. Another positive of the study is the patients who received this treatment shortly after the onset of shoulder pain, reported that their pain decreased and they felt back a huge difference in range of motion and function of their shoulder within the first few treatments of spinal manipulation. Lastly,

receiving manipulation therapy for patients who did not have a trauma or dislocation leading to their shoulder pain, found spinal manipulation to be helpful in decreasing their shoulder pain and regaining function. Shoulder pain with an insidious onset is often times more difficult to treat because you do not know what caused the pain but patients found this study to be very effective.

2. Exercise in the treatment of rotator cuff impingement: A systematic review and a synthesized evidence-based rehabilitation protocol By: John Kuhn (2008)

MeSH Terms: Shoulder, Impingement, Rotator Cuff, Rehabilitation, Physical Therapy, Physiotherapy, Exercise

Summary: Exercise is one of the best interventions to use when trying to treat shoulder pain or impingement syndrome, especially when surgery is not wanted.

Overall, this study and its findings were sound; however there were a few weaknesses. One weakness was that the study had different variations in the physical therapy aspect of the trial and as a result there was variation in the effectiveness of the individual programs. If the treatment is not controlled, there could be a substantial effect on the outcome and could become a performance bias. Ultrasound, which is used in many different offices for treatment on shoulder pain, was found to have little effect when it came to treatment of impingement syndrome. Doctors now are closer to having a gold standard rehabilitation program to use that improves the patient's condition and allows them to avoid surgery in large part due to the results of

this study. Exercise programs were found to improve symptoms of patients suffering from shoulder pain or impingement syndrome. Exercise was shown to be a statistically significant cause for reducing pain and increasing range of motion in the patients. This study will be helpful for future research to add different modalities to the rehabilitation protocol created and further increase the effectiveness of this study.

3. Physiotherapy for patients with soft tissue shoulder disorders: a systematic

review of randomized clinical trials By: Van der Windt et al. (1997)

MeSH Terms: Physiotherapy, Soft tissue, Shoulder, Shoulder disorders

Summary: Although trial sizes were small and it was hard to get statistically significant findings in this trial, exercise was consistent and was found to help patients who are experiencing shoulder pain.

This study was an important start to direct further research on how physiotherapy along with other modalities could increase healing time in patients with shoulder pain. There was a small sample size for the study which makes the results directional in nature. Another weakness of this study was that the sample size was heterogenous, meaning the patients all had different values the researcher wanted to study making it hard to get significant results. Lastly, the trials had a high number of patients withdrawing from the treatment which could have affected the final results in a negative way. It is important to repeat this research after adjusting for some of these flaws to see if techniques that were found to be directional are

in fact significant. A positive of this trial was that exercise was standardized thought out the patient population and was noted to be as effective as surgery in patients who were experiencing shoulder pain or had impingement syndrome. A second positive of this trial was they figured out that some modalities, like ultrasound, seem to be ineffective in treating and increasing healing time of shoulder pain. This may sound like a negative but they are now able to pull that out of treatment and focus on things that are actually beneficial to the patient. Lastly, exercise is something that can be done at the home of the patient and when it best fits in their schedule, making it something that most patients will comply with.

4. Chronic pain due to Little Leaguer's Shoulder in an adolescent baseball pitcher:

a case report By: David Wasylynko (2015)

MeSH Terms: Little leaguer' shoulder, Chiropractic, Humeral epiphyseolysis, Oveuse injury

Overall, this case report was helpful when determining what treatment to use on an adolescent experiencing shoulder pain from pitching in baseball because the adolescent used in this case report was in the same age group. However, this case report was only done to on patient and was only based on what the doctor felt was most helpful with this specific patient. Another weakness of this case report is that the doctor performing the study used many different modalities so it is harder to determine which one helped the patient the most. Lastly, treatment for Little Leaguer's Shoulder requires a significant amount of rest and time to heal and patients who are passionate

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about playing the sport and do not want to miss anytime, may not comply with the treatment plan. The patient used in the case report was 17 years old and had been playing baseball for a long time. Since he was pitching often, his condition became chronic and interfered with the closing of his growth plates, leading to a chronic condition. If the shoulder pain was addressed earlier, the patient might not have taken as long to heal. Having a multimodal approach allowed the doctor to try different things and the patient reported a decrease in tenderness upon palpation after only a few visits. Exercise and strengthening, along with rest, seemed to increase the healing time and allowed for the treatment to be more effective.

5. National Athletic Trainers' Association Position Statement: Prevention of Pediatric Overuse Injuries By: Valovich McLeod et al. (2011)

MeSH Terms: Adolescents, Children, Chronic injuries, Microtrauma, Growth, and Development

This study talks about the negative effect playing one sport all year long can have on an adolescent and how they grow. When adolescents are involved in a sport all year, they are more susceptible to overuse or microtrauma injuries that will become worse because they do not rest. The kids who play one sport all year are more likely to burn out faster because they do not have enough balance in their life which can affect them negatively. However, with proper training and conditioning both before, during, and after a sports season is a good way to prevent overuse injuries. The lack of patients continuing the treatment at home could have an effect on the overall results in a negative way. The screening done to be part of the trial did more tests

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on patients who reported previous injury. If a patient did not report previous injury, but in fact had one, they didn't get the extra testing done and they could introduce bias to the study. Teams are coming up with new rules to prevent overuse injuries in adolescents like limiting the number of pitches a little league pitcher is allowed to throw, instead of limiting the amount of innings they are allowed to pitch in. Combining limitations with exercising is an efficient way to prevent overuse injuries and allow the adolescent to grow properly. Physical therapist and athletic trainers worked together to find the best exercises to use on the adolescent population.

Important Clinical Note:

There is not a ton of research done on adolescents experiencing shoulder pain and what the proper protocol should be. Shoulder problems are more likely to occur in the older male population, therefore research involving adolescents with shoulder pain is limited. In 2 of the 5 articles listed above, the study was conducted on people over the age of 45. It is important to read and understand the literature and study that was done on the older population but you must take certain factors into account when trying to apply treatment to a younger population. The younger population are not physically or mental mature. This can effect treatment in a few ways. When you instruct the young patient to rest and do strengthening exercises at home, they might not take this as serious as they should. They are more likely to still play around and not fully “ rest” like they should and they might not do the exercises as often as required. It is also possible, especially when dealing with someone Miguel's age, they will tire faster and not complete the full amount of exercise needed. It's also important to take into account that

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they skeletal maturity. In adolescents, their growth plates are not closed, creating more laxity around the joint. The growth plate will undergo more stress in an adolescent and in turn is more susceptible to injury.

Plan of Management

To start the initial visit, a full history of the patient was taken and recorded. It is important to note that the patient was the only pitcher on his little league team last season and is most likely suffering from an overuse injury to the shoulder. Palpation of the shoulder was then performed to feel for any separation of the acromioclavicular joint or glenohumeral joint, swelling, and bicep tears (8). Some swelling was noted but all other structures felt normal. Palpation of the cervical spine and scapula were also performed to check for any tenderness or deformity. No deformities were noted. Miguel's upper cervical nerve roots were assessed by testing his dermatome, myotomes and deep tendon reflexes to see if check for nerve impingement. All nerve root assessments were within normal limits. Active, passive and resisted range of motion was then performed to see if any movements reproduced the shoulder pain and if there was weakness of the major muscles in the shoulder (8), this includes subscapularis, supraspinatus, infraspinatus, and teres minor. Active range of motion produced pain in Miguel's shoulder, indicating that there is a possible muscle strain, which would be consistent with an overuse shoulder injury. Orthopedic exams were then performed to better assess which muscles were involve. It was important to focus on the rotator cuff muscles so those orthopedic exams were performed first. Empty can test and Drop arm test were performed to assess the supraspinatus and the infraspinatus (4). The patient was able to perform the test but had a little

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pain when doing so. Lift off test, Bear hug and Belly press were then performed to check the subscapularis (4). These tests were positive and the patient demonstrated weakness. No adjustments or soft tissue work was performed on the initial visit and the patient was told to get an MRI.

The patient was sent for a magnetic resonance imaging (MRI) to rule out any tears in the shoulder. Although not expected, the MRI was also performed to rule out any malignant tumors like osteosarcoma or Ewing's sarcoma or benign tumors like osteoid osteoma. It also sought to rule out fractures of the humerus, more specifically the epiphysis or growth plate. The MRI result came back negative for tears, tumors, and fractures but was positive for swelling throughout the shoulder. The patient was diagnosed with a Grade II muscle strain of his rotator cuff.

After reading the results of the MRI, Miguel will be treated at the office with a multimodal approach. He will be treated with ART or active release therapy to try to eliminate any adhesion or scar tissue that is limiting his range of motion and proper function of his shoulder. This will be performed even though ART is found to be more anecdotal according to Wasylynko (7). Wasylynko did not have research done to back of his claim that ART is not beneficial. Miguel will also be treated with cervical and thoracic spinal manipulation. According to the research done by Bergman et. al. spinal manipulation will increase healing time and allow the patient to regain normal function of their shoulder sooner (1). He will be seen in the office twice a week for the next 8 weeks. During that time Miguel will be instructed and educated on at home strengthening exercises and stretches. He will do range of motion exercises like pendulum exercises, flexibility exercises, and

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exercises using bands and canes (5). It will be explained to him how important the rest aspect of this treatment is if he wants to regain full strength and not make his condition worse.

Contraindications

Since Miguel presents with shoulder pain, no spinal manipulation was performed on the initial visit until tears, tumors, or fractures were ruled out. Once they were ruled out there were no contraindications to adjustments in the cervical or thoracic spine. Miguel wants to have Tommy John's surgery but since his pain is more localized to the shoulder and not in the elbow, it is not appropriate for Miguel to have the surgery. Miguel's mother wants him to receive steroids to help with the pain. Steroids are only a temporary fix and come with side effect. Some potential side effects of steroid injections are nerve damage, joint infection, weakening of surrounding tendons, and thinning of nearby bones (2).

Clinical Practice Guidelines

For adolescent patients who are experiencing shoulder pain, it is important to get an MRI done before any treatment is performed to make sure there is not a more significant problem occurring in the shoulder. Once tears, fractures, and tumors are ruled out it is safe to adjust the patient and perform modalities that will help them heal faster.

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