

Shoulder Stem Cell Therapy as an Alternative to Total Shoulder Arthroplasty: A Retrospective Case Study

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Introduction

Background:

One of the many degenerative joint diseases of the shoulder joint is osteoarthritis (OA). A common option for treatment of OA is a total shoulder arthroplasty (TSA). TSA is a major surgery involving significant pain and a slow progression back to functional abilities. Autologous Stem Cell Therapy (ASCT) and Platelet Rich Plasma (PRP) injections to the shoulder represent a new advancement in medical technology and involves a relatively minor procedure with a speedier recovery.

Topic Studied:

This is a case study describing the experience of a patient who underwent ASCT and PRP procedures to her shoulder for the treatment of OA and posterior shoulder subluxation.

Statement of the problem:

With rehabilitation of the shoulder joint after stem cell injections becoming more commonly addressed by PT researches found very few published reports that studied protocols or the short- or long-term outcomes of ASCT and PRP injections to the shoulder complex.

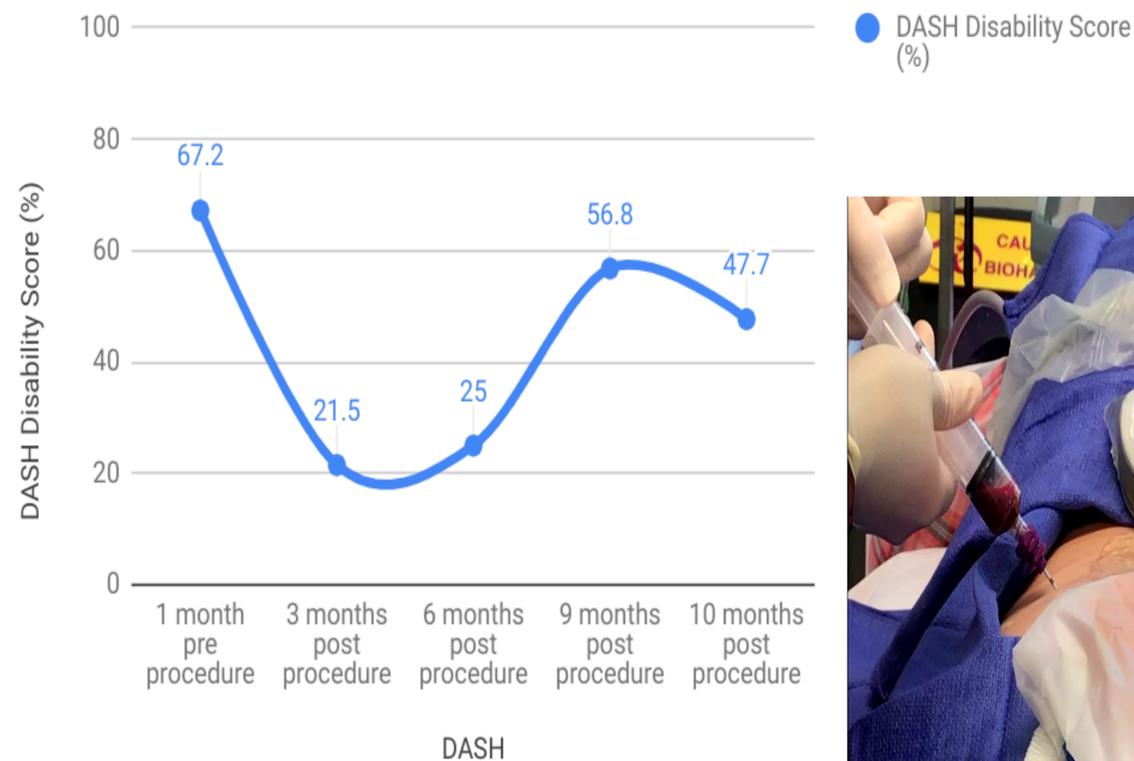
Materials & Methods

The subject was a 68-year-old female who reported having significant limitations in strength, range of motion, ability to complete household chores, dressing, and recreational activities. In September of 2017, the subject elected to receive ASCT and PRP injections to her right glenohumeral joint with follow-up physical therapy in lieu of total shoulder arthroplasty. In order to monitor changes in the patient's recovery, the primary outcome measure used was the Disabilities of the Arm Shoulder and Hand (DASH) survey, which contained 30 questions designed to score levels of function and pain in the upper extremity. The subject filled out the DASH survey one month prior to receiving stem cell therapy to provide a base level of her chronic shoulder dysfunction and a baseline to be used for later comparisons. The subject then filled out a DASH survey one month, two months, and six months after her stem cell injection. A second follow up on the subject's condition measured by the DASH survey was performed at eleven and twelve months. Post-procedure surveys were compared with the initial survey to assess changes in the subject's function and was corroborated with manual muscle testing and range of motion assessments. These outcome measures were analyzed for changes in the subject's function to provide data on the impact of shoulder stem cell therapy for the patient.

Results & Project Impact

The subject participated in 5 DASH surveys over a span of approximately 11 months. All survey scores represent a disability score out of 100, and thus the subject's lower scores at various time periods correlate with better functional outcomes and performances. The DASH survey taken 9 days prior to the subject's stem cell procedure measured a disability of 67.2%. After the stem cells were injected the subject began receiving physical therapy for 2 months. The results of the baseline DASH survey was compared with subsequent DASH surveys in order to see functional changes the patient experienced over time. The subject completed a one-month post procedure meeting with the physician in order to provide subjective feedback on her function levels. At that visit she reported that she felt 85% improved and was without pain. The 2nd DASH survey was completed 3 months post procedure and showed a 21.5% disability; an improvement of 45 percentage points from the pre-procedure score. The next DASH survey was taken 6 months post procedure, with a score of 25%; an improvement of 42.2 percentage points from the pre-procedure disability score. Due to a decline in abilities, a decrease in her range of motion, strength and a return of pain at 9 months post procedure the subject began physical therapy once again. At that time a fourth DASH survey noted a disability score of 56.8%, which was a regression from the DASH survey received at 6 months by 31.8 percentage points. A final DASH survey was completed 10 months post procedure, which revealed a disability score of 47.7%. This last survey, was following one month of physical therapy and indicated an improvement of 9.1 percentage points from the previous DASH survey taken at 9 months post procedure.

DASH Disability Score (%) vs. DASH



Discussion and Conclusion

Discussion:

We identified factors that may have influenced the patient's outcomes. One was that the patient requested the discontinuation of physical therapy after 2 months. Another factor that could have contributed to the loss of functional improvement was the subject's failure to attend appointments with the physician after the one-month follow-up. There may have been beneficial procedures available to maintain the improvements that she had gained. After 9 months post procedure, the patient began physical therapy and added supplementation with turmeric. At this point she gained minor improvements from the sharp decrease in performance (see graph). The patient subsequently underwent a total reverse shoulder arthroplasty and has had a full recovery of function without pain.

Conclusion:

Our case study demonstrates improvement in the DASH score that was primarily attributed to ASCT and PRP injections. This improvement in the DASH score declined after a period of approximately six months. Future studies will need to establish whether the short-term benefits that this patient's experienced can be maintained for the long term.

Works Cited

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