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COMPARISON OF THE EFFECTIVENESS OF ARTHROSCOPIC AND NON-SURGICAL TREATMENT METHODS ON SHOULDER FUNCTION AND PAIN IN DIABETIC PATIENTS WITH ADHESIVE CAPSULITIS OF THE SHOULDER, LITERATURE REVIEW

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Abstract

This study compares the effectiveness of arthroscopic and non-surgical treatments, including strengthening exercises, for managing adhesive capsulitis in diabetic patients. A review of the papers that investigated the diabetic patients with adhesive capsulitis done. Key outcomes such as pain reduction, shoulder mobility, and functional improvement were measured. Both treatments showed significant improvements, with arthroscopic treatment offering quicker pain relief and mobility improvement, while non-surgical treatments, especially strengthening exercises, provided significant long-term benefits. The findings highlight the importance of incorporating strengthening exercises for better outcomes in diabetic patients.

Keywords: Adhesive Capsulitis, Frozen Shoulder, Diabetic Patients, Arthroscopic Treatment, Non-Surgical Treatments, Strengthening Exercises, Pain Reduction, Shoulder Mobility

Introduction

Background

Frozen Shoulder Contracture Syndrome (FSCS), also known as Frozen Shoulder (FS), is a common and debilitating musculoskeletal condition that causes significant pain, restricted movement, and functional limitations (De Cristofaro, 2021). The condition is often associated with underlying factors such as diabetes, female sex, and age, which appear to influence prognosis and treatment outcomes (Alsubheen et al., 2019). FSCS typically progresses through stages of pain,

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stiffness, and eventual thawing, which can last for months to years if left untreated (Longo et al., 2018).

Currently, there is no universally accepted therapeutic intervention for FSCS. Non-surgical management options, including physiotherapy, intra-articular corticosteroid injections, hydrodilatation, and transcutaneous electrical nerve stimulation, are widely used as initial treatment strategies (Kwaees & Charalambous, 2015; Munshi et al., 2024). However, surgical interventions such as manipulation under anesthesia (MUA) and arthroscopic capsular release are employed when conservative measures fail (Salomon et al., 2022). Notably, evidence suggests that the failure rates for surgical interventions may be higher compared to non-surgical approaches, further emphasizing the importance of optimizing conservative treatments (Longo et al., 2018).

The cost-effectiveness of different treatment modalities has also come under scrutiny, as FSCS places a considerable financial burden on healthcare systems. Studies have called for further research to identify cost-effective approaches, particularly comparing surgical and rehabilitative treatments (Lathiere et al., 2024). Additionally, while the biological factors influencing FSCS are well-studied, limited research exists on the role of psychological and biopsychosocial factors in predicting outcomes (De Cristofaro, 2021; Zhang et al., 2019). For example, individuals with diabetes not only experience a higher prevalence of FSCS but also demonstrate poorer treatment outcomes, potentially due to glycosylation of collagen and diabetic microangiopathy (Alsubheen et al., 2019).

In light of these challenges, this study aims to investigate the prognostic factors associated with non-surgical treatment outcomes in FSCS. Drawing from biopsychosocial assessments, this research evaluates a broad spectrum of patient-specific variables, including age, gender, comorbidities, and psychological factors, to determine their impact on pain, function, and range of motion recovery. By addressing existing knowledge gaps, this study seeks to provide clinicians with evidence-based insights into tailoring treatments and improving outcomes for individuals with FSCS.

Objective

This article aims to evaluate the effectiveness of arthroscopic treatments compared to non-surgical approaches in the management of shoulder osteoarthritis and adhesive capsulitis, with a focus on diabetic patients. Furthermore, the role of strengthening exercises in long-term outcomes will be examined. By comparing these treatment options, the article seeks to determine which methods provide the most effective relief and functional improvement for patients suffering from these conditions.

Discussion

Shoulder osteoarthritis (OA) and adhesive capsulitis (AC) are common musculoskeletal conditions that severely affect shoulder function and cause significant pain. In diabetic patients, these conditions are more prevalent and tend to be more severe due to hyperglycemia's effects on connective tissues and increased inflammation. Various treatment approaches, including both arthroscopic and non-surgical methods, have been explored for their effectiveness in managing shoulder dysfunction and pain in this population.

Arthroscopic Treatments

Arthroscopic debridement and joint-preserving arthroscopic techniques have been investigated in multiple studies for managing shoulder OA and AC. Weinstein et al. (2000) found that

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arthroscopic debridement for early-stage glenohumeral OA led to favorable outcomes, with 72% of patients reporting good results, including pain reduction and improved range of motion. This suggests that arthroscopy is an effective treatment for patients with early OA and mild joint incongruity.

Similarly, Millett et al. (2012) studied the outcomes of a comprehensive arthroscopic management (CAM) procedure in patients with advanced glenohumeral arthritis. The CAM procedure, which combines chondroplasty, osteophyte resection, and capsular release, showed significant improvements in pain, range of motion, and function. In particular, the procedure delayed the need for shoulder arthroplasty, with a survival rate of 92% at 1 year, indicating its effectiveness in joint preservation.

Further studies by George (2009) and Pitta et al. (2016) emphasized the success of arthroscopic debridement and resurfacing in patients with mild to moderate OA. These procedures helped reduce pain and improve shoulder functionality, particularly in cases where traditional surgical options were not suitable.

Non-Surgical Treatments for Shoulder Osteoarthritis and Adhesive Capsulitis

Non-surgical treatments, particularly physical therapy and strengthening exercises, are vital in the management of shoulder OA and AC. Neviaser and Neviaser (2011) reviewed the management of adhesive capsulitis, noting that progressive stretching exercises and physical therapy are often successful in improving shoulder function and alleviating pain without the need for surgery. Surgery is generally recommended only for patients who fail to respond to conservative treatments after 6 months.

For diabetic patients, non-surgical treatments are particularly crucial, as the risks of surgery and slower healing responses must be considered. Strengthening exercises have proven beneficial in reducing pain, improving function, and preventing further stiffness, all of which are essential for diabetic patients who may face longer recovery times following surgery.

Non-surgical treatments, including physiotherapy and strengthening exercises, also demonstrated positive effects, though the improvements were generally more gradual. Strengthening exercises played a crucial role in enhancing the outcomes for these patients. These exercises not only helped in alleviating pain but also contributed to improved shoulder mobility and functional capacity, particularly in patients who were not candidates for surgery or those with milder symptoms. Therefore, while arthroscopic treatment offers more immediate results, strengthening exercises remain a valuable component of non-surgical management, especially for long-term rehabilitation.

Pharmacological treatments for adhesive capsulitis, particularly intra-articular corticosteroid injections, have shown significant short-term efficacy in reducing pain and improving functionality. Kitridis et al. (2018) conducted a network meta-analysis and found that corticosteroid injections, either alone or combined with shoulder capsule distension, provided meaningful pain relief. Interestingly, multiple-site corticosteroid injections demonstrated advantages in both short- and intermediate-term outcomes compared to placebo. However, these benefits dissipated over time, necessitating multidimensional treatment approaches. Complementing these findings, Das (2016) highlighted the significant impact of frozen shoulder on patients' quality of life, particularly in terms of physical function. Patients often reported severe pain and difficulties with daily activities, underscoring the need for effective, holistic management strategies. Laylani (2022) emphasized that combining physiotherapy with pharmacological interventions is critical, especially for diabetic patients, as they are more susceptible to persistent

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symptoms. Furthermore, Sharma and Jacobs (2011) discussed the need for tailored interventions, weighing the natural resolution of frozen shoulder against more invasive treatments such as surgical capsular release. Collectively, these studies advocate for individualized care plans that integrate pharmacological, physiotherapeutic, and, where necessary, surgical options to address the diverse needs of patients with adhesive capsulitis.

Conclusion

This study highlights the effectiveness of both arthroscopic and non-surgical treatments for managing adhesive capsulitis in diabetic patients. While arthroscopic treatment provided more immediate pain relief and greater improvements in shoulder mobility, non-surgical interventions, particularly strengthening exercises, proved to be valuable for long-term functional improvement and pain management. Strengthening exercises were especially important in enhancing outcomes for patients undergoing non-surgical treatments, contributing to improved shoulder function and mobility.

The findings emphasize the importance of a comprehensive treatment approach, integrating both surgical and non-surgical methods tailored to individual patient needs. Incorporating strengthening exercises into treatment protocols—whether used in combination with arthroscopic procedures or as a standalone intervention—can significantly improve patient outcomes. These results suggest that both treatment modalities should be considered in managing diabetic patients with adhesive capsulitis, with a focus on personalized care to maximize recovery and long-term function. Further studies with larger sample sizes and longer follow-up periods are needed to refine these treatment strategies and provide stronger evidence for their long-term benefits.

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