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Comparison of the Effectiveness of Suprascapular Nerve Block and Combined Subacromial-Intra-articular Injections in the Management of Shoulder Pain Refractory to Conservative Treatment

Konservatif Tedaviye Dirençli Omuz Ağrısının Tedavisinde Supraskapular Sinir Bloğu ve Kombine Subakromiyal Eklem İçi Enjeksiyonlarının Etkinliğinin Karşılaştırılması

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Abstract

Background: The aim of this study was to compare the efficacy of suprascapular nerve block (SSSB) with the combination of subacromial + intraarticular (SAI + IAI) injection in patients with chronic shoulder pain refractory to conservative treatment.
Materials and Methods: This retrospective study included a total of 114 patients who received interventional pain management at the Pain Medicine Clinic between 2022 and 2024 and met the follow-up criteria. The patients were allocated into two groups based on the type of treatment administered: SSSB, n=54 and combined subacromial and intra-articular injection (SAI + IAI, n=60). Pain intensity was assessed using the visual analog scale (VAS), functional status was evaluated with the Shoulder Pain and Disability Index (SPADI), and quality of life was measured through the Short Form-36 (SF-36) at baseline, 2 weeks, 3 months, and 6 months post-treatment.
Results: In both groups, statistically significant improvements were observed in VAS, SPADI and SF-36 scores at all post-treatment time points (2 weeks, 3 months and 6 months) ($p<0.001$). These improvements were sustained through the 6-month follow-up. However, there was no statistically significant difference in the extent of improvement between the two treatment groups ($p>0.05$).
Conclusions: SSSB and the combination of SAI + IAI demonstrated comparable clinical efficacy in the management of chronic shoulder pain unresponsive to conservative treatment. However, SSSB, being less invasive, offers advantages in terms of ease of administration and patient comfort. Moreover, its therapeutic effects were sustained for up to six months. These findings suggest that SSSB may be considered an effective standalone interventional treatment option in this patient population
Keywords: Shoulder pain, Suprascapular nerve block, Subacromial injection, Intra-articular injection, SPADI

Öz

Amaç: Bu çalışmanın amacı, konservatif tedaviye yanıt vermeyen kronik omuz ağrısı olan hastalarda uygulanan supraskapular sinir bloğu (SSSB) ile subakromiyal + intraartiküler (SAI + IAI) enjeksiyon kombinasyonunun etkinliğini karşılaştırmaktır.
Materyal ve metod: Bu retrospektif çalışmaya, 2022-2024 yılları arasında algoloji kliniğinde girişimsel ağrı tedavisi uygulanan ve takip kriterlerini karşılayan toplam 114 hasta dahil edilmiştir. Hastalar, tedavi tipine göre SSSB (n=54) ve SAI + IAI enjeksiyon (n=60) olmak üzere iki gruba ayrılmıştır. Ağrı düzeyi visual analog skala (VAS), fonksiyonel durum Shoulder Pain and Disability Index (SPADI) ve yaşam kalitesi Short Form-36 (SF-36) ölçekleri kullanılarak tedavi öncesi, 2. hafta, 3. ay ve 6. ayda değerlendirilmiştir.
Bulgular: Her iki grupta da tedavi sonrası tüm zaman noktalarında (2. hafta, 3. ay, 6. ay) VAS, SPADI ve SF-36 skorlarında istatistiksel olarak anlamlı düzeyde iyileşme gözlenmiştir ($p<0,001$). Bu iyileşmenin 6. aya kadar devam ettiği saptanmıştır. Gruplar arasında iyileşme büyüklüğü açısından istatistiksel olarak anlamlı fark bulunmamıştır ($p>0,05$).
Sonuç: SSSB ve SAI + IAI kombinasyonu, konservatif tedaviye dirençli kronik omuz ağrısında benzer klinik etkinliğe sahiptir. Ancak daha az invazif olan SSSB, uygulama kolaylığı ve hasta konforu yönünden ön plana çıkmakta, etkisinin 6 aya kadar sürdüğü gözlemlenmektedir. Bu nedenle SSSB, tek başına etkili bir girişimsel tedavi seçeneği olarak değerlendirilebilir.
Anahtar Kelimeler: Omuz ağrısı, Supraskapuler sinir, Eklem içi enjeksiyon, SPADI

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Introduction

As one of the most mobile joints in the human body, the shoulder joint plays a vital role in performing activities of daily living. However, its extensive range of motion renders it particularly susceptible to structural degeneration and instability (1). The prevalence of shoulder pain is estimated to be between 16% and 26%, making it the third most common reason for consultations related to the musculoskeletal system. In addition, approximately 1% of adults seek medical help each year for new-onset shoulder pain (2,3). This condition can result in diminished work capacity, functional impairments, and a reduced quality of life (3,4).

Rotator cuff disorders, subacromial impingement syndrome, adhesive capsulitis, glenohumeral osteoarthritis and tendon tears are the most common causes of shoulder pain (3,4). In addition to clinical evaluation, imaging techniques such as magnetic resonance imaging (MRI) and ultrasonography (USG) also play an important role in improving diagnostic accuracy (5). Although treatment approaches may vary depending on the underlying etiology, available options include conservative management, physical therapy, pharmacological treatment, and interventional pain management techniques (3,4). Interventional approaches in algology are particularly prominent in cases that are refractory to conventional treatment modalities. Among these, suprascapular nerve block (SSNB), subacromial and intra-articular (SAI + IAI) injections, are commonly employed techniques for both diagnostic and therapeutic purposes (3,4,6). These methods are intended not only to alleviate pain but also to enhance functional capacity. In contemporary practice, the majority of such interventional procedures can be performed more safely and effectively under ultrasonographic guidance (7-9).

The current literature includes numerous studies investigating the efficacy of interventional methods in the management of shoulder pain (6,9-11). Although numerous studies in the current literature have investigated the efficacy of interventional techniques for shoulder pain, many are limited by small sample sizes and short follow-up durations. In addition, there is a lack of comprehensive data comparing the effectiveness of different injection modalities. Additional research is therefore warranted to evaluate and compare the clinical efficacy of SSNB and the combination of SAI + IAI injections in this context.

The main objective of this study was to evaluate and compare the clinical outcomes of the two interventional approaches in patients with chronic shoulder pain that is unresponsive to conservative treatments, including analgesic medication, physical therapy, and exercise. Specifically, the effects of SSNB and SAI + IAI combination therapy on pain intensity (Visual Analog Scale, VAS), functional capacity (Shoulder Pain and Disability Index, SPADI), and quality of life (Short Form-36, SF-36) were evaluated. These outcomes were assessed in light of existing multicenter literature, and the two methods were directly compared. While individual studies have assessed the efficacy of each technique separately (12-17), evidence on their long-term comparative effectiveness remains limited. This study aims to address that gap and contribute to clinical decision-making by providing evidence-based guidance on interventional treatment planning for chronic shoulder pain.

Materials and Methods

Study Design and Patient Selection

This retrospective study analyzed the clinical data of 114 patients who presented to the Pain Medicine Clinic of Adana City Training and Research Hospital between 2022 and 2024. All patients had chronic shoulder pain persisting for at least three months that was unresponsive to conservative treatments, including physical therapy, analgesic medication, and exercise, as confirmed through clinical evaluation and imaging findings (Figure 1). Ethical approval was obtained from the Adana City Training and Research Hospital Clinical Research Ethics Committee prior to the study (approval no: 564, date: June 4, 2025). Following approval, patient data were reviewed retrospectively using hospital electronic medical records and teletype communications. Our study was conducted in accordance with the principles of the Declaration of Helsinki. The authors declare no conflicts of interest.

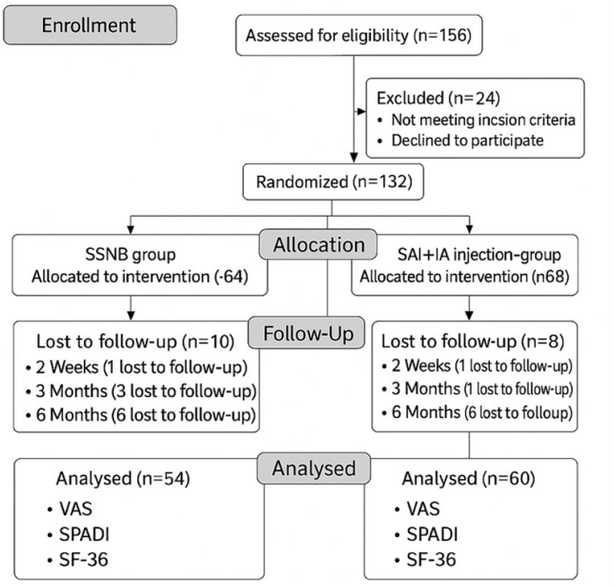

Figure 1. Study flow chart

Demographic characteristics such as age, gender, body mass index (BMI), clinical diagnosis, pain localization were recorded. Pain severity, functional status and quality of life were assessed at four time points: before treatment (baseline) and at 2 weeks, 3 months and 6 months post-treatment. Evaluations were conducted using the visual analog scale (VAS) for pain, the Shoulder Pain and Disability Index (SPADI) for functional status, and the Short Form-36 (SF-36) for quality of life.

Inclusion Criteria

Patients who were 18 years of age or older, who had persistent shoulder pain for at least 3 months, who did not respond to conservative treatment methods (analgesic drugs, physical therapy applications, exercise programs),who were diagnosed with frozen shoulder, subacromial impingement syndrome, rotator cuff tear or glenohumeral osteoarthritis by clinical evaluation and/or imaging methods (USG, MRI), and who were followed up for at least 6 months after interventional treatment and whose follow-up data were recorded completely were included in this study.

Exclusion Criteria

Patients were excluded from the study in the presence of malignancy or infection in the shoulder region, history of previous shoulder surgery, contraindication to nerve block or injection (such as bleeding diathesis), systemic inflammatory disease (rheumatoid arthritis, systemic lupus erythematosus, etc.), bilateral shoulder involvement, calcific tendinitis, or incomplete follow-up data or death during the follow-up period.

Injection Method

Patients in the first group underwent SSSB, whereas patients in the second group received a combination of SAI + IAI injections. All procedures were performed under ultrasonographic guidance using a linear-type high-frequency transducer (5-13 MHz) (Affiniti 70, Philips Ultrasound Inc., USA) by physicians with a minimum of five years of clinical experience in interventional pain procedures. Each patient was positioned in a seated posture, intravenous access was obtained, and standard monitors (pulse oximetry, electrocardiogram, and noninvasive arterial pressure) were applied in accordance with procedural safety protocols.

For SSSB, patients were positioned in a seated posture with a slight forward inclination. Strict aseptic conditions were maintained throughout the procedure. An ultrasound probe was placed in the transverse plane at the level of the scapular spine. Under ultrasound guidance, the suprascapular notch located lateral to the scapular spine and the transverse scapular ligament covering it were identified as anatomical landmarks. Using an in-plane technique, a needle was advanced medially toward the suprascapular notch. The suprascapular nerve and the accompanying suprascapular artery were visualized sonographically. A prepared drug mixture was then injected around the nerve, resulting in circumferential spread. Successful nerve block was confirmed by the appearance of hypoechoic fluid surrounding the nerve. Particular care was taken to avoid vascular structures throughout the procedure (Figure 2).

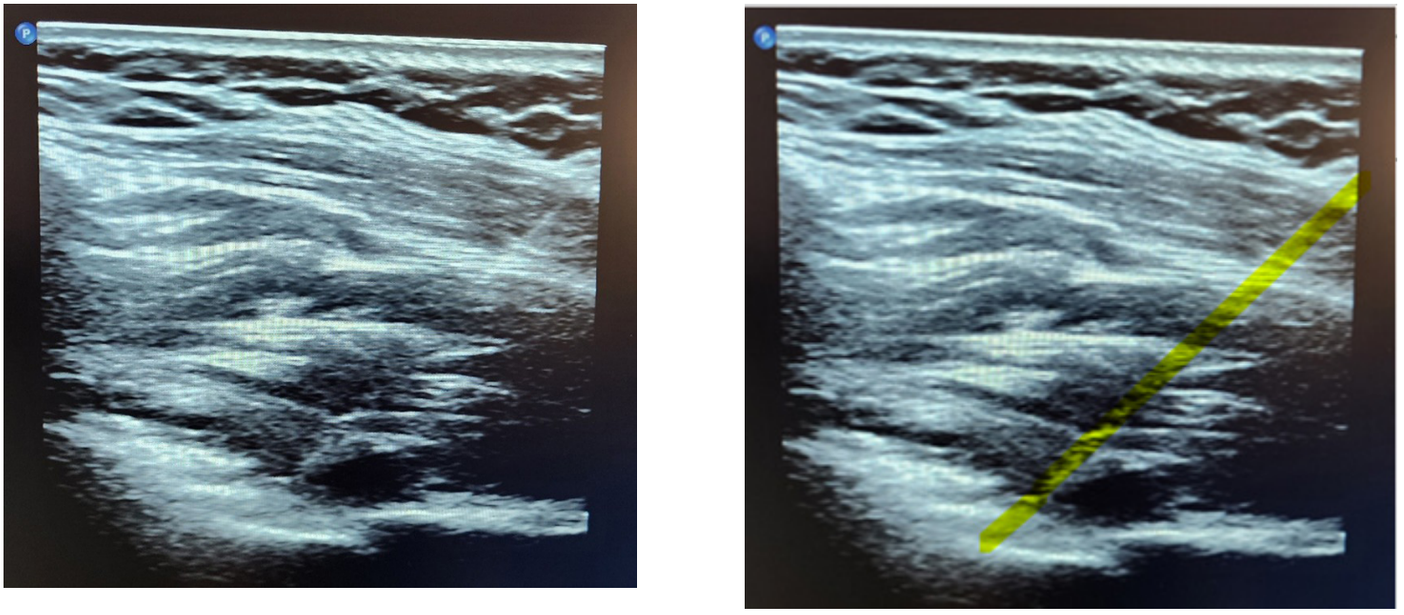

Figure 2. SSNB USG guided injection

SSNB: Suprascapular nerve block, USG: Ultrasonography

For the subacromial injection, the patient was positioned in a seated posture, an ultrasound probe was placed in the sagittal plane immediately inferior to the acromion to visualize the subacromial-subdeltoid bursa. Using an in-plane technique, a needle was advanced from lateral to medial, and the injectate was delivered precisely into the subacromial bursa under real-time ultrasound guidance.

For the intra-articular injection, the shoulder was stabilized in slight internal rotation. To obtain an axial view and clearly visualize the glenoid, humeral head, and posterior joint capsule, an ultrasound probe was placed in the posterior shoulder region. Using the in-plane technique, the needle was advanced from lateral to medial under real-time ultrasound guidance. When the needle tip was correctly positioned within the posterior glenohumeral joint space, the injection was administered (Figure 3).

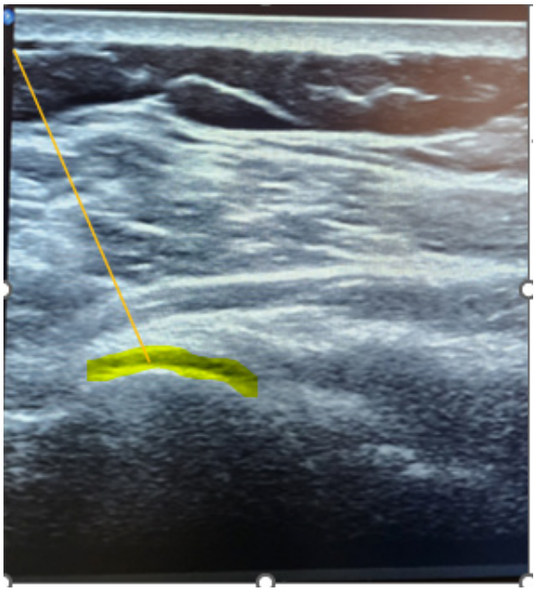

Figure 3. USG guided intraarticular glenohumerol injection
USG: Ultrasonography

In both groups, a total volume of 8 mL was administered, consisting of 3 mL of 0.5% bupivacaine, 1 mL (40 mg) of triamcinolone, and 4 mL of saline. In the SSNB group the entire mixture was delivered as a single injection around the suprascapular nerve. In the combined injection group, the same total volume was divided equally between the SAI + IAI spaces, with each site receiving 4 mL containing [1.5 mL bupivacaine, 0.5 mL triamcinolone (20 mg), 2 mL saline, 4 mL subacromial and 4 mL intra-articular].

Statistical Analysis

In this study, data obtained from two treatment groups, patients who underwent SSSB and patients who underwent SAI + IAI injections, were analyzed. Descriptive statistics were calculated, including mean, standard deviation, and percentage values. To compare demographic and clinical variables (e.g., age, gender, and BMI) between the two groups, the Independent Samples T-test was used for continuous parametric variables, and the chi-square test was used for categorical variables.

To evaluate changes in pain intensity (VAS) and shoulder functional status (SPADI) over time, as well as their interaction with treatment groups, a two-factor repeated measures analysis of variance (Repeated Measures ANOVA) was conducted. Measurements at four time points-pre-treatment (baseline), postoperative 2nd week, 3rd month, and 6th month-were included in the analysis. Both the main effect of time and the time x treatment group interaction were assessed. Prior to analysis, the assumption of sphericity was tested using Mauchly's test; when this assumption was violated, the Greenhouse-Geisser correction was applied. A p-value of <0.05 was considered statistically significant. All statistical analyses were performed using IBM SPSS Statistics, version 25.0.

Results

In this study, a total of 114 patients with chronic shoulder pain who underwent interventional pain management were evaluated. Of these, 60 (52.6%) were male and 54 (47.4%) were female. The mean age of the overall cohort was 54.33±12.89 years (range: 30-75 years), with a mean age of 55.20±13.18 years for males and 53.37±12.62 years for females. The difference in mean age between sexes was not statistically significant (p=0.452).

The mean BMI of the study population was 27.56±4.45 kg/m². The mean BMI was 27.00±4.21 kg/m² in male and 28.17±4.65 kg/m² in female patients, with no statistically significant difference between the groups (p=0.166). Pain localization was reported as posterior in 39 patients (34.2%), lateral in 40 patients (35.1%), and anterior in 35 patients (30.7%). The distribution of clinical diagnoses was as follows: subacromial impingement syndrome in 33 cases (28.9%), rotator cuff tear in 29 cases (25.4%), glenohumeral osteoarthritis in 26 cases (22.8%), and frozen shoulder in 26 cases (22.8%).

Among the participants, 54 (47.4%) received SSSB, while 60 (52.6%) were treated with a combination of SAI + IAI injections. Comparative analyses of the treatment methods and the evaluated clinical parameters are presented in Table 1.

Pain Intensity (VAS) in Relation to Treatment Groups

VAS scores decreased significantly over time in both treatment groups with SSSB and SAI + IAI injections. Repeated Measures ANOVA indicated a statistically significant main effect of time [Wilks' Lambda = 0.137, $F(3,110) = 231.47$, $p<0.001$, $\eta^2=0.863$], suggesting a marked improvement in pain levels across all time

points. However, the time x treatment group interaction was not statistically significant [Wilks' Lambda =0.978, F(3,110) =0.828, p=0.481, η^2=0.022], indicating that the pattern of pain reduction over time was comparable between the two treatment groups. Additionally, there was no statistically significant difference in overall VAS scores between the two treatment groups [F(1,112) =0.027, p=0.870, η^2=0.001], demonstrating that while both treatment modalities were effective in reducing pain, neither was found to be advantageous over the other in terms of pain relief. These findings are presented in Table 2 and illustrated in Figure 4.

Table 1. Comparison of demographic and clinical parameters

Parameter	SSNB group (n=54)	SAI + IAI group (n=60)	p-value
Age (years)	55.43±13.52	53.35±12.33	0.393
BMI (kg/m²)	27.28±4.37	27.81±4.54	0.523

SSNB: Suprascapular nerve block, BMI: Body mass index, SAI + IAI: Subacromial and intra-articular

Table 2. Comparison of VAS scores between treatment groups over time

Measurement time point	Group 1 (SSNB) (n=54)	Group 2 (Sub + IA) (n=60)	Total (n=114)	p-value
VAS-Baseline	8.00±1.40	7.90±1.35	7.95±1.37	0.699
VAS-post-treatment week 2	5.19±1.43	5.13±1.43	5.16±1.42	0.847
VAS-post-treatment month 3	3.98±1.55	4.30±1.34	4.15±1.45	0.242
VAS- post-treatment month 6	3.17±1.40	2.92±1.37	3.04±1.37	0.333

VAS: Visual analogue scale, SSNB: Suprascapular nerve block, BMI: Body mass index, SAI + IAI: Subacromial and intra-articular

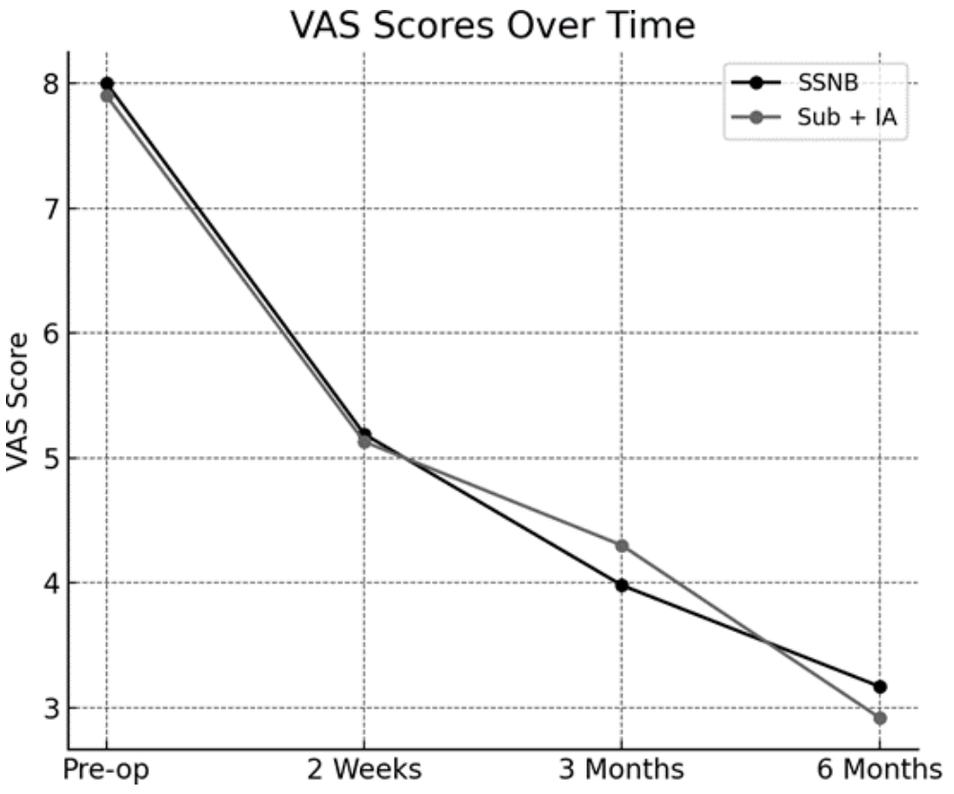

Figure 4. Change in VAS scores over time

VAS: Visual analogue scale

Functional Status (SPADI) in Relation to Treatment Groups

SPADI scores decreased significantly over time in both treatment groups, with SSSB and SAI + IAI injections. According to the results of the Repeated Measures ANOVA, the main effect of time was statistically significant [Wilks' Lambda =0.126, F(3,110) =254.29, p<0.001, η^2=0.874], indicating a substantial improvement in shoulder-related pain and functional limitations over the course of the study.

The time x treatment group interaction was not statistically significant [Wilks' Lambda =0.986, F(3,110) =0.502, p=0.681, η^2=0.014), suggesting that the trajectory of improvement in SPADI scores over time was comparable between the two treatment groups.

Moreover, no significant overall difference was found between the groups [F(1,112) = 0.142, p=0.707, η^2=0.001], demonstrating that both treatment modalities were similarly effective in improving shoulder function and reducing pain. These findings are summarized in Table 3 and visualized in Figure 5.

Table 3. Comparison of SPADI scores between treatment groups over time

Measurement time point	Group 1 (SSNB) (n=54)	Group 2 (SUB + IA) (n=60)	Total (n=114)	p-value
SPADI-Baseline	79.31±11.03	81.32±12.29	80.37±11.70	0.364
SPADI post-treatment week 2	57.43±13.13	57.23±12.29	57.32±12.64	0.936
SPADI post-treatment month 3	47.85±11.42	48.85±11.59	48.38±11.47	0.645
SPADI post-treatment month 6	41.19±12.48	40.05±12.60	40.59±12.50	0.630

SSNB: Suprascapular nerve block, SAI + IAI: Subacromial and intra-articular, SPADI: Shoulder Pain and Disability Index

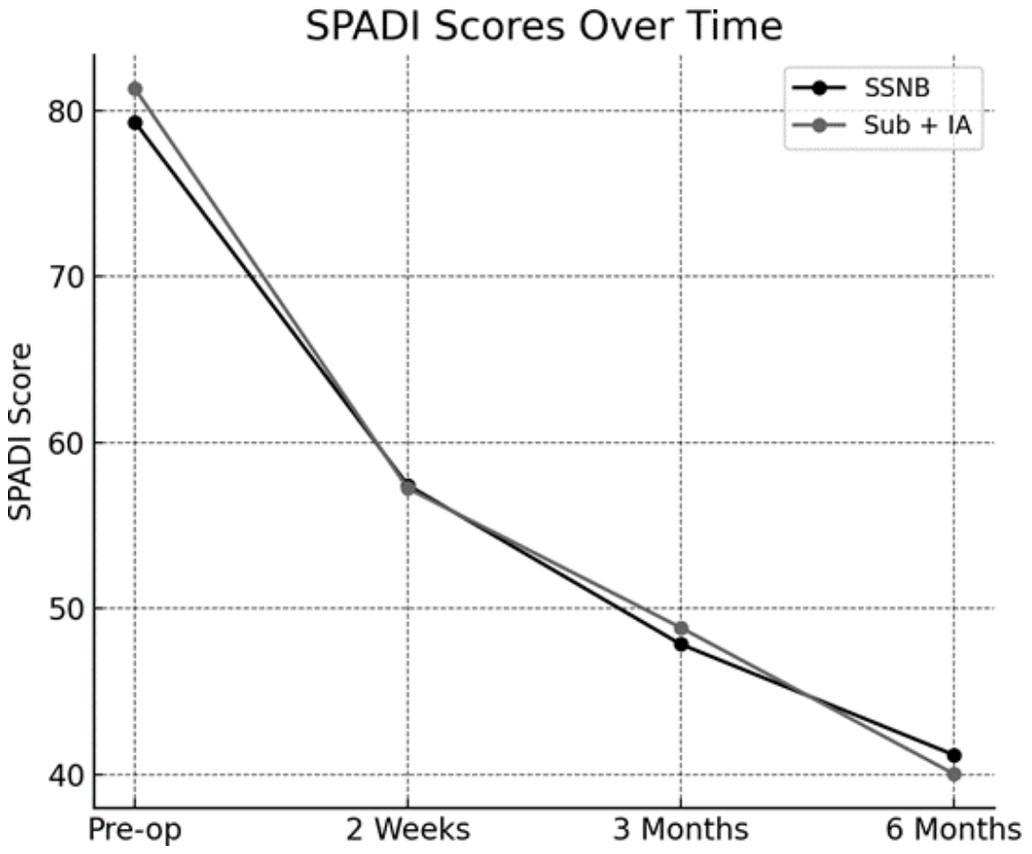

Figure 5. Change in SPADI scores over time

SPADI: Shoulder Pain and Disability Index

Quality of Life (SF-36) in Relation to Treatment Groups

SF-36 quality of life scores showed a marked improvement in both treatment groups compared to baseline. Statistically significant increases were observed at all follow-up time points-week 2, month 3, and month 6 ($p<0.05$). However, no significant differences were found between the two treatment groups at any of the follow-up intervals ($p>0.05$). A continuous upward trend in quality of life was noted throughout the follow-up period, with the improvement becoming more pronounced particularly at the 3rd and 6th months. These findings are summarized in Table 4 and illustrated in Figure 6.

Table 4. Comparison of Quality of Life (SF-36) scores between treatment groups over time

Measurement time point	Group 1 (SSNB) (n=54)	Group 2 (SUB + IA) (n=60)	Total (n=114)	p-value
SF-36 Baseline	25.06±11.78	26.28±12.13	25.70±11.93	0.585
SF-36 post-treatment week 2	49.54±12.71	50.22±12.52	49.89±12.56	0.774
SF-36 post-treatment month 3	62.20±13.36	59.57±11.58	60.82±12.47	0.261
SF-36 post-treatment month 6	69.26±9.88	70.40±11.05	69.86±10.48	0.564

SSNB: Suprascapular nerve block

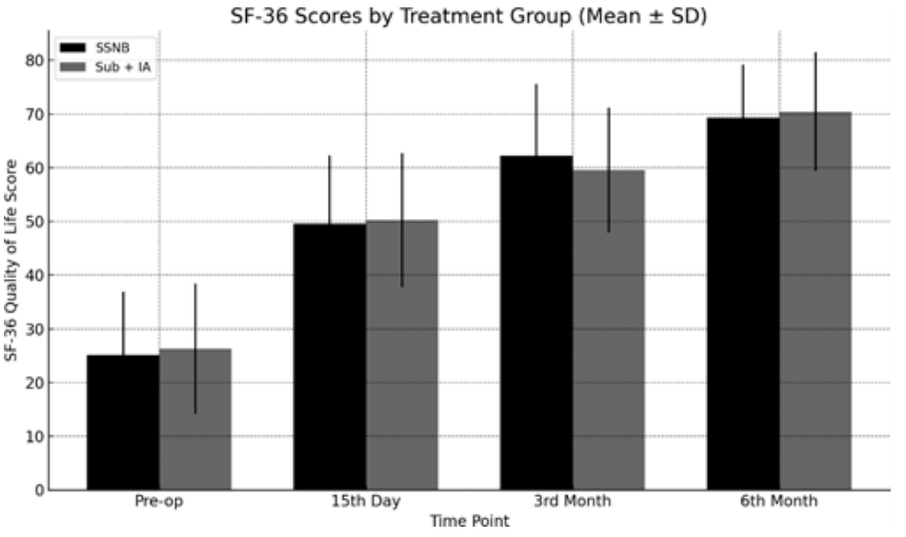

Figure 6. Comparison of SF-36 quality of life scores between treatment groups over time

Discussion

This study compared the clinical efficacy of SSSB and combined SAI + IAI injections in patients receiving interventional treatment for chronic shoulder pain. The findings demonstrated that both treatment modalities led to significant improvements in pain intensity (VAS), shoulder function (SPADI), and quality of life (SF-36) across all follow-up periods. However, no statistically significant differences were observed between the two groups in the degree of change in VAS, SPADI, or SF-36 scores over time ($p>0.05$) (Tables 2-4), indicating that both interventions were similarly effective in reducing pain, improving functional status, and enhancing quality of life in patients with chronic shoulder pain.

Chronic shoulder pain is a widespread musculoskeletal issue that can often cause significant functional impairment and reduces quality of life (18). In cases where conservative treatments fail, interventional techniques such as SSSB, subacromial, and intra-articular injections have emerged as effective therapeutic options (9,19). Injections targeting the suprascapular nerve are widely employed in the management of various chronic shoulder pathologies, offering analgesic and functional benefits (10). Intra-articular injections, especially those containing corticosteroids, have been shown in many studies to effectively reduce pain, improve functional status, and increase range of motion (16,20,21).

USG is widely preferred in interventional injection procedures due to its many advantages, such as no exposure to radiation, high

anatomical accuracy, and low risk of complications. Ultrasound-guided injections improve treatment efficacy and patient safety by increasing the accuracy of needle placement (8,9). In adults with shoulder pain, corticosteroid injections performed under ultrasound guidance have been shown to result in greater clinical improvement compared to blind (landmark-guided) techniques. Furthermore, it has been emphasized that accurate needle placement is a critical determinant of long-term clinical outcomes (7,22).

In the treatment of chronic shoulder pain, minimally invasive approaches are becoming increasingly important, especially for patients who do not respond adequately to conservative methods or who are unable to undergo such treatments (16). Adjunctive treatment options such as SSNB and subacromial bursa injection (SABSI) play a significant role in this patient population, especially when physical therapy is ineffective or impractical. In a related study, 95 patients diagnosed with subacromial impingement syndrome who were unable to comply with physical therapy protocols were divided into three groups: SABSI alone, SSNB alone, and a combination of SABSI + SSNB. Clinically significant improvements were observed in all groups at the three-month follow-up; however, pain (VAS) and function (DASH) scores were significantly superior in the combined treatment group ($p<0.001$) (23). These findings suggest a potential synergistic effect when SSNB and SABSI are administered together. Similarly, in the present study, the combination of SAI + IAI injections demonstrated comparable efficacy to SSNB alone. Both treatment modalities resulted in clinically significant improvements in pain, function, and quality of life. Moreover, SSNB was noted to offer an advantage in terms of patient comfort due to its minimally invasive nature.

The combination of SSNB and subacromial plus intra-articular (SA + IA) injections represents a promising approach for reducing pain and enhancing functional capacity in patients with chronic shoulder pain. Several studies in literature have evaluated the efficacy of these methods individually (13,17). Coory et al. (13) reported that SSNB provided superior pain relief and functional improvement compared to subacromial injection at both 6 and 12 weeks in a study involving 43 patients with rotator cuff lesions. In the present study, the addition of intra-articular injection to subacromial administration resulted in pain reduction and functional gains comparable to those observed in the SSNB group. This finding suggests that the therapeutic efficacy of a single SSNB may also be achieved through a combination injection, offering a viable alternative for managing chronic shoulder pain.

The meta-analysis carried out by Chang et al. (12) supports these findings demonstrating the superiority of SSNB over placebo and physical therapy, while also reporting comparable efficacy to intra-articular injections. In the present study, a direct comparison between SSNB and combined SA + IA injections in patients unresponsive to physical therapy revealed no statistically significant difference in the magnitude of clinical improvement between the groups ($p>0.05$). These results suggest that both interventional methods provide comparable levels of clinical efficacy in the treatment of chronic shoulder pain.

The combined use of SSNB and subacromial corticosteroid injection (SCI) has demonstrated a significant improvement in pain control and functional outcomes in various shoulder pathologies, particularly in subacromial impingement syndrome, with effects lasting up to three months. These findings suggest that SSNB may enhance long-term treatment efficacy when used as an adjunct to SCI (24). In the present study, SSNB alone was found to be equally effective as the combination of SAI + IAI injections, with sustained clinical benefits observed for up to six months.

Moreover, the administration of SSNB as a single injection highlights its minimally invasive nature profile and potential advantages in terms of patient comfort and compliance. In this context, SSNB can be considered a versatile and effective intervention, suitable for both monotherapy and combined treatment strategies. Further research is warranted to elucidate its precise role and long-term efficacy, particularly in the context of steroid-free protocols.

Limitations

Several limitations were identified in this study. First, the retrospective design carries the risk of selection bias. Second, the single-center nature of the study with a relatively small sample size limits the generalizability of the findings to larger populations. Additionally, since the follow-up period was limited to six months, it was not possible to comprehensively assess the long-term efficacy of the interventions or their potential side effects. Therefore, these results should be interpreted with caution and confirmed by future studies with larger sample sizes and prospective, randomized controlled designs.

Conclusion

In conclusion, the clinical efficacy of SSSB, SAI, and IAI has been demonstrated in numerous studies, including the present investigation. In our study, both SSSB and the combined SAI + IAI injection methods resulted in comparable improvements in pain, functional status, and quality of life in patients with chronic shoulder pain. However, SSSB offered additional advantages in terms of ease of administration, minimal invasiveness, and improved patient comfort. These findings suggest that SSSB alone represents an effective and practical interventional treatment option. Further prospective, randomized controlled studies involving larger cohorts are required to clarify the long-term efficacy of SSSB, particularly within steroid-free treatment protocols.

Ethical Approval: *This study was approved by the Adana City Training and Research Hospital Clinical Research Ethics Committee (approval no: 564, date: June 4, 2025).*

Author Contributions:

Concept: A.Y., Ç.K.

Literature Review: A.Y., A.B.

Design: A.Y., Ç.K.

Data acquisition: A.Y., Ç.K.

Analysis and interpretation: A.Y., A.B.

Writing manuscript: A.Y., A.B., Ç.K.

Critical revision of manuscript: A.Y., A.B., Ç.K.

Conflict of Interest: *The authors have no conflicts of interest to declare.*

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