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Research Article

Translation, cultural adaptation, and validation of the Turkish-specific acromioclavicular score

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ABSTRACT

Objective: The Specific Acromioclavicular Score (SACS) is a questionnaire that assesses functional outcomes for Acromioclavicular Joint (ACJ) pathologies. The aim of this study was to evaluate the ease of use, reliability, and validity of the Turkish-translated and culturally adapted form of the SACS.

Methods: The SACS was translated into Turkish according to Beaton's recommendations. Seventy-eight patients were included in this study (67 with acute or chronic AC instability and 11 with symptomatic ACJ arthritis). The mean interval between test and retest was 13.2 ± 4.6 days. The reliability of the tools was measured with the intraclass correlation coefficient. External validity was evaluated using correlations between the SACS, Oxford Shoulder Score (OSS), Shoulder Pain and Disability Index (SPADI), American Shoulder and Elbow Surgeons (ASES) Shoulder score, and the SF-36 version 2 (SF-36v2). Floor and ceiling effects were also analyzed.

Results: The mean time to complete the Turkish SACS was 3 min 18 s (range, 1 min 40 s to 7 min 9 s). The test–retest reliability was excellent (ICC, 0.988). There was a very good correlation between SACS, OSS, SPADI, and ASES scores ($r = 0.645$, 0.645, and −0.682, respectively, $P < 0.05$). A poor correlation was observed between SACS and subscales of SF-36v2 ($P > 0.05$). No floor or ceiling effects were detected.

Conclusion: The Turkish version of the SACS is a reliable and valid tool to measure outcomes after various types of acromioclavicular joint pathologies.

Level of Evidence: Level IV, Diagnostic Study

Introduction

The acromioclavicular joint (ACJ) is one of four joints in the shoulder, and its main functions include assisting shoulder motion, transmitting forces from the upper extremity to the trunk, and maintaining scapular positioning.[1] ACJ pathologies may cause pain in overhead movements, shoulder weakness, and scapular dyskinesia.[2]

Numerous studies have reported the results of different treatment methods and defined new surgical techniques for ACJ. Most of the authors used the Constant Murley Score (CMS), Oxford Shoulder Score (OSS), Shoulder Pain and Disability Index (SPADI), and the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES) as tools to assess outcomes.[3-5] Short Form-36 version 2 (SF-36v2) is a nonspecific self-reported measure of general health and well-being and is widely used to assess the quality of life in patients with ACJ pathologies.[6,7]

In a recent systematic review, the most appropriate scoring systems for ACJ injuries suggested by the authors were the CMS, Visual Analog Scale score, ASES, and Simple Shoulder Test scores together to report ACJ injury outcomes.[8] However, these scores are not specific to ACJ pathologies. They are mostly focused on shoulder pain and function. The shoulder deformity due to ACJ pathologies, an important indicator of function and strength, can be the main complaint of patients.[9] Many researchers have measured the satisfaction of the patients by the appearance of their shoulder, subjectively.[10,11] In most of the commonly used shoulder outcome scores, deformity or cosmetic satisfaction of the patients are not considered. Recently, Barwood et al. suggested a new scoring system called "Specific AC Score" (SACS).[12] In their study involving 125 ACJ injuries treated surgically, SACS has been reported as a reliable, valid, and responsive tool to assess both traumatic and degenerative pathologies in the ACJ.[12]

SACS is an English language patient-reported outcome measure (PROM), which was derived from Australian patients. SACS contains two additional questions regarding the aesthetic satisfaction of the patient (10

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points/100) and the sense of crepitus, which is not uncommon in ACJ instability.[13]

To use a questionnaire in a different language, it should be not only translated but also culturally adapted to the new language. Therefore, the purpose of this study was to evaluate the reliability and validity of the culturally adapted version of the Turkish-Specific AC Score. We hypothesized that Turkish version of the SACS would show adequate reliability and validity.

Materials and Methods

Statement of ethics

This study was approved by our institutional research review board (Approval number: 2020-06/31, Date: 17.06.2020). Informed consent was obtained from all participants.

Translation and culturally adaptation process

Specific AC Score was translated and culturally adapted to the Turkish language according to Beaton's recommendations.[13] Two native Turkish-speaking individuals who were also fluent in English translated the original SACS into Turkish. The first translator was an orthopedic surgeon who was fluent in English, and the other was a professional translator. After the two individuals completed all translation independently, further bilingual individual and two translators reviewed and compared the two translations. This committee made a synthesis from those two translations, and the forward translation process was completed. After the Turkish translation was completed, two native English speakers, who were also fluent in Turkish, translated the questionnaire into English. Both back translators were blind to the concept of the study and had no access to the original questionnaire. The expert committee, consisting of a methodologist, a language professional, and the four bilingual individuals reviewed the two forward translations, two back translations, and the final version and made a concensus for the Turkish version of the SACS.

Patients

Between 2016 and 2020, patients who were diagnosed with acute or chronic ACJ instability or symptomatic ACJ arthritis were included in the study. Exclusion criteria were the following: patients under the age of 18 years, with mental impairment, with neurologic impairment, and knew a native language other than Turkish or had previous shoulder surgery from the affected side. All patients were evaluated in the outpatient clinic, and patient demographics, type of ACJ pathology, and treatment choices were recorded. All patients completed the Turkish version of SACS twice within a 2-week interval.

Outcome tools

The specific AC score consists of three sections: pain (A), function (B), and life quality (C). The first section has 4, the second has 11, and the third has 6 questions, respectively. The last question of the third section (C6) did not affect the score. In each question, the maximum point is 10, and the minimum is 0. The maximum point[10] represents a minimum function, worst pain, or minimum quality of life.[12] We used the OSS, ASES, SPADI, and SF-36v2 for validation of SACS. All of these questionnaires were adapted and validated in Turkish language.[11–14]

HIGHLIGHTS

- The optimal patient reported outcome measure for acromioclavicular joint pathologies remains controversial and using different measures makes it difficult to perform meta-analysis.
- Specific Acromioclavicular Score (SACS) was designed to measure outcomes for both traumatic and degenerative ACJ pathologies.
- Turkish version of SACS is reliable and valid and can be used to measure functional outcomes of Turkish patients with ACJ pathologies.

The OSS is a PROM consisting of 12 questions, and each question consists of points ranging from 1 to 5. The questionnaire ranged from 12 to 60. Maximum points (60) represent the worst outcome and minimum points the best outcome.[14] The ASES consists of two sections in which the first section is self-reported and the second part is completed by the physician. Scores on the ASES range from 0 (minimum function) to 100 (normal function).[15] The SPADI is another valid and reliable questionnaire to measure shoulder disorders. SPADI has 13 questions. Five questions measure pain and 8 measure disabilities.[16] It was shown that SPADI is a responsive and fast questionnaire to complete.[17]

The SF-36v2 is not a disease- or region-specific PROM. It expresses the general health status of the patients. SF-36v2 measures physical and mental health. The physical health part consists of physical functioning (10 items), role-physical (4 items), bodily pain (2 items), and general health (5 items). The mental health part consists of vitality (4 items), social functioning (2 items), role-emotional (3 items), and mental health (5 items). Scores for each part range from 0 (worst) to 100 (best).[18] SF-36v2 is one of the most widely used health-related quality-of-life (HRQOL) measures in orthopedic studies.[19]

Statistical analysis

The test–retest reliability is a measure of the reproductivity of the questionnaire when measured repeatedly.[20] The reliability of the scale was calculated using the internal consistency method and test–retest method between repeated administrations. To determine test–retest reliability, we applied the questionnaire to 78 participants two times within a mean 13.2 ± 4.6-day interval. To minimize the risk of change between the two tests, no additional treatment was given during the interval period. None of the participants was an acute case, so rapid changes in clinical status were not expected between the two tests.

For convergent validity of the Turkish SACS, we used translated and culturally adapted versions of the SPADI, OSS, and ASES questionnaires. Divergent validity was evaluated using the mental health, emotional role functioning, and mental components of the SF-36v2. The distribution of total points was evaluated to assess content validity. A ceiling effect occurs when the maximum possible score is achieved, and a floor effect is observed when the minimum possible score is reached.[21] We considered scores between 90% and 100% to be maximum scores, and scores between 0% and 10% were minimum scores. It was accepted that floor and ceiling effect occurs when 15% or more of the participants reach minimum or maximum score.

The Kolmogorov–Smirnov test was used to analyze the distribution of the data. The intraclass correlation coefficient (ICC) was used to assess the test–retest reliability of the Turkish SACS questionnaire. Correlation value between 0.81 and 1.0 was interpreted as excellent, between 0.61 and 0.80 as very good, between 0.41 and 0.60 as good, between 0.21 and 0.40 as fair, and between 0.00 and 0.20 as poor.[22]

Convergent and divergent validities were analyzed with Spearman correlation coefficients, and a 95% confidence interval (CI) was used for all correlation coefficients. The Wilcoxon test was used to detect differences between the test and retests. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 23 (IBM SPSS Corp., Chicago, IL, USA). Statistical significance was set at $P < 0.05$.

Table 1. Demographic Details of the Patients

	n	%
Sex		
Female	23	29.5
Male	55	70.5
Side		
Right	40	51.3
Left	38	48.7
Treatment		
Surgery	56	71.8
Conservative	22	28.2
Fixation material		
Endobutton	37	47.4
Kirschner wire	19	24.4
None	22	28.2
ACJ Injury Classification		
Type 1	10	12.8
Type 2	18	23.0
Type 3	26	33.3
Type 4	8	10.2
Type 5	5	6.4
ACJ osteoarthritis	11	14.1

ACJ, Acromioclavicular Joint.

Results

The mean time to complete the Turkish version of the SACS was 3 min 18 s (1 min 40 s to 7 min 9 s). A pilot study was conducted to evaluate the participant's coordination with the questionnaire. Fifteen patients were included in the pilot study (9 men and 6 women; mean age, 34.0 ± 9.4). Two patients had difficulty in understanding the Turkish translation of "primary sporting activity" (question B10). No other major difficulties were observed.

The final version of the Turkish SACS is shown in the Appendix. A total of 78 patients with a mean age of 38.2 ± 12.6 were included in the study. The mean follow-up period was 38.2 ± 12.2 months. Patient characteristics are shown in Table 1. There was no significant difference between test and retest values in any of the measures ($P > 0.05$).

The median SACS was 72 (23–88) in the first measure and 72 (32–86) in the second; therefore, Turkish-language SACS questionnaire showed excellent reliability (ICC, 0.988; 95% CI, 0.981–0.992).

The Turkish SACS showed moderate-to-high validity. The correlation between SACS and other questionnaires is shown in Table 2. None of the patients scored between and 0–10 or 90–100 points. Therefore, no floor or ceiling effects were detected.

Discussion

The study has demonstrated that the Turkish version of the SACS has excellent reliability and adequate validity.

During the forward translation process, translators disagree with the translation of "grinding." The first translator translated that word as "sürtünme." However, consensus was obtained to use "gıcırdama" to express that feeling, which is more familiar for the Turkish-speaking population. No other major difficulties were observed during the translation process.

The Turkish population is culturally heterogeneous. Some terms may be familiar to people who live in metropolitan areas, but the same term may seem unfamiliar to people who live in the countryside. To prevent misunderstanding, we put alternative words to some questions to address all people from different cultural incomes.

The optimal interval between the test and retest is not clear. In similar studies, many authors used short intervals (2–10 days) between the tests to minimize the possibility of change in the clinical status of the patients.[23–25] However, other researchers prefer to use longer intervals.[26] We used a long interval between test and retest (13.2 ± 4.6 days) to prevent patients from memorizing their first answers. Most of our study population included chronic cases. Therefore, rapid changes in clinical status were of less concern for us.

In the original study, the test–retest reliability of SACS was excellent (ICC, 0.89).[9] The current study is the first confirmation of this finding. Our findings showed that the reliability of Turkish SACS was excellent (ICC = 0.988, 95% CI).

The Turkish SACS seems useful and practical for both patients and physicians. The mean time to complete the form was 3 min 18 s. SACS contains 20 questions, with a maximum possible point of 100. Therefore, calculation of total points is easy for physicians.

We used SPADI, ASES, OSS, and SF-36v2 for validation of the Turkish SACS. Reference tests were successfully translated and adapted to the Turkish language.[27–30] In our study, the strongest correlation of Turkish SACS was between SPADI ($r = 0.772$). The correlation between Turkish SACS, OSS, and ASES was also significant but fair ($r = 0.645$ and -0.682). Barwood et al. used the same questionnaires for validation and evaluated patients preoperatively and postoperatively. They reported a strong correlation between SACS and SPADI and moderate correlations between SACS and OSS and ASES.[12]

The correlation between HRQOL measures and shoulder scores was evaluated before assessing the validity of the new score. Tuğay et al. reported a fair-to-moderate correlation between the Turkish version of OSS and SF-36v2 components.[29] Celik et al. found a fair correlation between the Turkish version of the modified CS and SF-12.[31] We could not detect a significant correlation between the Turkish version of SACS and any of the SF-36v2 components. The correlation between SACS and SF-36v2 has not been evaluated before. This is an expected finding because SF-36v2 measures general life status rather than the function of a specific region.

The present study has some limitations. The primary limitation of this study was the relatively small study population. Additionally, the

Table 2. Correlations between the SACS and Other Questionnaires

				Short Form 36 v2								
	SPADI	ASES	OSS	Physical Function	Physical Role	Emotinal Role	Vitality	Mental Health	Social Function	Bodily Pain	General Health	Health Change
SACS	0.772*	−0.682*	0.645*	−0.101	−0.103	−0.078	0.158	−0.035	−0.125	0.094	−0.211	−0.118

*A *P* value less than 0.05.

number of ACJ arthritis cases was small ($n = 11$, 14.1%); therefore, the validity of the Turkish version of SACS for ACJ arthritis can be questioned. Among the shoulder questionnaires, the Constant Murley Score is the most popular shoulder questionnaire used in the assessment of functional outcome after ACJ pathologies.[8] In our study, SACS was not compared with the Constant Murley Score. We preferred to use the same tools in the original study.

As conclusion, the Turkish translation and culturally adapted version of the SACS is reliable and valid and can be used to measure clinical status of Turkish patients with ACJ pathologies. The Turkish version of the specific AC score contains adequate questions to assess pain, function, and cosmetic status in patients with acromioclavicular joint pathologies.

Ethics Committee Approval: Ethics committee approval was received for this study from the Clinical Investigations Research Ethics Board of Cumhuriyet University, School of Medicine (Approval date/number: 17.06.2020/2020-06/31).

Informed Consent: Informed consent was obtained from all participants.

Author Contributions: Concept - M.Özçamdallı; Design - M.Özçamdallı; Supervision - M.Özçamdallı; Data Collection and/or Processing - S.O., T.B.K.; Analysis and/or Interpretation - M.Önder; Literature Review - E.U.; Writing - S.O.; Critical Review - A.M.

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

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Appendix 1. Ayrıntılı Akromioklaviküler Eklem Skoru (AAES) ve standart test protokolü

Ayrıntılı Akromioklaviküler Eklem Skoru (AAES)

Açıklama: Her soruda, ağrı seviyenizi veya farklı görevleri yerine getirmenin zorluğunu derecelendirmeniz istenecektir.

Değerlendirme ölçeği, "0" ağrı veya zorluk göstermeyecek şekilde "10 " ise en şiddetli ağrı ve zorluk miktarını gösterecek şekilde tasarlanmıştır.

Örn. (Ağrı yok) 0 1 2 3 4 5 6 7 8 9 10 (En şiddetli ağrı)

Not: 1-) **Yalnızca bir numarayı daire içine alınız**
2-) **2 numaralı seviye minimum ağrıyı temsil eder**

A-) Ağrı Bölümü:

A1. Omuzunuzdaki en kötü/en şiddetli ağrı seviyesini değerlendiriniz.

(Ağrı yok) 0 1 2 3 4 5 6 7 8 9 10 (En Şiddetli Ağrı)

A2. Omuzunuzdaki en iyi/en düşük ağrı seviyesini değerlendiriniz.

(Ağrı yok) 0 1 2 3 4 5 6 7 8 9 10 (En Şiddetli Ağrı)

A3. Omuzunuzun üzerine bastırdığınızda/dokunduğunuzda veya basınç uyguladığınızda oluşan ağrının seviyesini değerlendiriniz.

(Ağrı yok) 0 1 2 3 4 5 6 7 8 9 10 (En Şiddetli Ağrı)

A4. Boynunuzda ve/veya etkilenen kürek bölgenizde hissettiğiniz ağrı, gerginlik veya çekilme hissi seviyesini değerlendiriniz.

(Ağrı yok) 0 1 2 3 4 5 6 7 8 9 10 (En Şiddetli Ağrı)

B-) İşlev Bölümü

B1. Omuzunuzda yaşadığınız çıtlama ve/veya aşınma ve/veya ses çıkması seviyesini değerlendiriniz.

(Çıtlama/Aşınma/Ses çıkması Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Çıtlama/Aşınma/Ses çıkması)

B2. Yürüdüğünüzde eğer etkilenen kolunuzu desteklemeye ihtiyaç duyuyorsanız belirtiniz. (Örn. Kolunuzu cebinizde dinlendirerek veya kol askısı kullanarak)

(Destek İhtiyacı Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Destek İhtiyacı)

B3. Kolunuza dayanırken veya ağırlık kaldırırken yaşadığınız zorluk seviyesini değerlendiriniz. (Örn. Şınav çekme, bisiklet sürme, yoga egzersizleri)

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama)

B4. 5 dakikadan uzun süre boyunca ağır nesneleri kaldırırken yaşadığınız zorluk seviyesini belirtiniz. (Örn. Market Torbaları taşırken)

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama)

B5. Etkilenen kolunuzla vücudunuzun karşı tarafına erişmeye çalışırken yaşadığınız zorluk seviyesini değerlendiriniz. (Örn. Etkilenmeyen omuzunuza erişmeye ve dokunmak için)

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama)

B6. Ağır nesneleri veya ağırlıkları başınızın üzerine kaldırırken yaşadığınız zorluk seviyesini değerlendiriniz (Örn. Beş kilogramdan fazla)

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama)

B7. Etkilenen kolunuzu uzun bir süre önünüzde tutmanın zorluk derecesini değerlendiriniz. (Örn. otomobil sürme sırasında direksiyonu tutarken)

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama)

B8. Mesleğinizi icra ederken çektiğiniz zorluk derecesini değerlendiriniz.

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama) Uygulanamaz / Geçerli Değil

B9. Omuzunuzdaki sorunu dengelemek için mesleğinizi/işinizi ne sıklıkla değiştirdiğinizi/düzenlediğinizi değerlendiriniz.

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama) Uygulanamaz / Geçerli Değil

B10. Başlıca sportif aktivitenizi gerçekleştirirken çektiğiniz zorluk derecesini değerlendiriniz.

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama) Uygulanamaz / Geçerli Değil

B11. Omuz sorununuzu dengelemek için başlıca sportif aktivitelerinizi ne sıklıkla düzenlediğinizi değerlendiriniz.

(Zorluk Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Zorluk veya Uygulayamama) Uygulanamaz / Geçerli Değil

Yaşam Kalitesi ve Memnuniyet Bölümü

C1. Normal bir omuza kıyasla omuzunuzun üzerindeki kemiklerin görünümündeki farkın derecesini değerlendiriniz. (Yumru varlığı dahil)

(Fark Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Fark Var)

C2. Omuz sorununuzun sizde sebep olduğu genel kaygı ve stres seviyesini değerlendiriniz.

(Anksiyete/Stres Yok) 0 1 2 3 4 5 6 7 8 9 10 (Aşırı Anksiyete / Stres)

C3. Omuzunuzdaki sorunun ne sıklıkla farkındasınız?

(Hiç) 0 1 2 3 4 5 6 7 8 9 10 (Sıkça)

C4. Omuzunuzdaki sorunu şiddetlendirmemek veya arttırmamak için yaşam tarzınızı düzenliyor musunuz?

(Çok değil) 0 1 2 3 4 5 6 7 8 9 10 (Tamamıyla)

C5. Omuzunuz ile alakalı ne kadar mutsuzsunuz/hoşnutsuzsunuz?

(Son derece mutlu) 0 1 2 3 4 5 6 7 8 9 10 (Son derece mutsuz)

C6. Normal bir omuz beklentisine kıyasla yüzde olarak omuzunuzu genel olarak nasıl değerlendirirsiniz?

%0 (Kötü), %100 (Çok İyi)? _____%

Anketin Sonu. Tamamladığınız için teşekkür ederiz.

*Bu puanlama bölümü yalnızca tıbbi personelin kullanımı içindir.

PUANLAMA

Her bölümün tüm sorularının toplamını ekleyin.

A Bölümü =_____/4 0 ; B Bölümü = _____ /110

C Bölümü = _____ / 50 ; Bütün Bölümlerin Toplamı = _____

Sonra mümkün olan en yüksek puanı bölün/200 _____

Sonra 100 ile çarpın = _____%

NOT- C6 puanlamaya dahil değildir.

Öğeler tamamlanamazsa veya uygulanamazsa, öğelerin mümkün olan en yüksek puanı kullanılır. 20 öğeden 15'i tamamlanırsa skor 150'ye (mümkün olan en yüksek skor) bölünür ve 100 ile çarpılır.

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Research Article

Clinical and radiological results of three different techniques for fixation of the olecranon osteotomy in the surgical treatment of distal humerus fractures: A retrospective comparison of plate-screw, tension band and intramedullary nail

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ABSTRACT

Objective: The aim of this study was to compare clinical and radiological results of three different techniques (plate-screw, tension band, and intramedullary nail) in the fixation of olecranon osteotomy in patients with intercondylar fracture of the distal humerus surgically treated by the olecranon osteotomy approach.

Methods: Between January 2010 and December 2018, the study was initiated with 52 patients who underwent an olecranon osteotomy approach for an AO Type C distal humerus fracture. Thirty-seven patients (19 male, 18 female) who had regular control data and a final control examination were included in the study. In osteotomy fixation, we used tension band (K wire cerclage + Screw cerclage) in 20 patients, plate-screw in eight patients, and intramedullary nail fixation in nine patients. The functional evaluation included a measurement of the range of joint motion (flexion, extension, supination, pronation); MAYO elbow performance score; disabilities of the arm, shoulder, and hand (DASH) score; and comparative grip strength measurement, and a subjective pain assessment was performed using the visual analogue scale.

Results: The mean duration of follow-up was 44 (12-84) months. The mean time to union was 14 (7-32) weeks in patients that achieved union. The mean DASH score was 22 (0-72.7), the mean MAYO elbow performance score was 84 (35-100), and the mean VAS score was 3 (1-7). The mean grip strength was 32 (8-64) kgw in the treated extremity and 37 (17-70) kgw in the intact extremity. No statistically significant difference was detected between olecranon osteotomy fixation methods (tension band, plate-screw osteosynthesis, and intramedullary nailing) in terms of union time, DASH score, MAYO scale score, VAS score, extension, supination, and pronation ($P > 0.05$). The average grip strength (kgw) was lower than that in the uninvolved extremity, and this ratio was statistically significant ($P = 0.04$).

Conclusion: The results of this study have shown that successful and comparable radiological and functional outcomes can be obtained by all the three different olecranon osteotomy techniques in the surgical treatment of intercondylar fracture of the distal humerus.

Level of Evidence: Level III, Therapeutic Study

Introduction

The elbow joint has complex anatomical and biomechanical features.[1] Fractures of the distal humerus constitute approximately 1–6% of all fractures.[1-5] Intercondylar fractures (AO Type C),[6] however, make up less than 1%,[3] and they display a bimodal distribution. While high-energy and comminuted fracture patterns are observed in young individuals, elderly patients exhibit simple fractures as a result of falling due to osteoporosis.[1,2]

In recent years, elbow circumference anatomy has become better understood. In addition, the advantages of newly designed implants in application have increased the tendency for open reduction and internal fixation.[3] The limited visualization area of the elbow joint requires different surgical approaches,[3,4] and posterior approaches are frequently used. Triceps reflecting, anconeus reflecting, and triceps splitting approaches have been described. Different approaches can be used depending on the type of fracture.[3] Although there is a consensus on the requirement of surgical treatment, the optimal treatment method is still controversial. The fixation that best visualizes the inside of the joint and that enables optimal anatomical restoration of the joint line, including intra-articular small fragments, should be performed. However, the gold standard treatment method in comminuted intercondylar fractures is the olecranon osteotomy approach.[3-5] The olecranon

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