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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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COMPREHENSIVE INSTRUMENTAL AND FUNCTIONAL ASSESSMENT OF POST-TRAUMATIC ELBOW CONTRACTURE IN CHILDREN AT THE INITIAL STAGE OF REHABILITATION

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Abstract.

Introduction: Post-traumatic elbow contracture in children may include osseous, capsular, scar-related, muscular, and pain-related components. Range-of-motion measurement alone does not fully characterize limitations in daily activities and quality of life.

Objective: To describe the baseline instrumental and functional profile of children with post-traumatic elbow contracture and to assess the concordance of joint-specific function with upper-limb disability, manual ability, and quality of life.

Methods: This cross-sectional analysis used baseline data from a prospective controlled study conducted in 2023-2025. The sample included 216 children aged 6-16 years assigned by non-randomized stratified matching to the intervention cohort (n=102) or comparison cohort (n=114). Baseline assessment included radiography, multislice computed tomography (MSCT) with three-dimensional (3D) reconstruction, ultrasonography with elastography, electronic goniometry, pain assessment, the Mayo Elbow Performance Score (MEPS), the Disabilities of the Arm, Shoulder and Hand questionnaire (DASH), the ABILHAND-Kids manual ability questionnaire, and the Pediatric Quality of Life Inventory (PedsQL). Mean differences, 95% confidence intervals (CIs), Hedges standardized effect size (Hedges g), Fisher exact tests, and Spearman correlation coefficients were calculated.

Results: All 216 participants were included, and no baseline data were missing. The most frequent findings were joint-space narrowing in 28 children (13.0%; 95% CI 9.1-18.1%), osseous block in 27 (12.5%; 95% CI 8.7-17.6%), and capsular thickening in 27 (12.5%; 95% CI 8.7-17.6%). Between-group differences were small for flexion, extension deficit, MEPS, DASH, and PedsQL, with all p values >0.05 and $|g| \leq 0.20$. MEPS correlated with DASH (r=-0.62), ABILHAND-Kids (r=0.57), and PedsQL (r=0.51); all p<0.001.

Conclusion: Baseline assessment of pediatric post-traumatic elbow contracture should integrate morphology, range of motion, pain, and patient-oriented function. The two cohorts were broadly comparable before rehabilitation. Moderate correlations indicate that the functional instruments capture related but non-interchangeable domains.

Key words. Post-traumatic contracture, elbow, children, computed tomography, ultrasonography, range of motion, mayo elbow performance score, disabilities of the arm, shoulder and hand, ABILHAND-Kids, pediatric quality of life inventory.

Abbreviations:

3D: Three-Dimensional; ABILHAND-Kids: Manual Ability Questionnaire for Children; CI: Confidence Interval; CTDIvol: Volume Computed Tomography Dose Index; DASH: Disabilities of the Arm, Shoulder and Hand Questionnaire; DLP: Dose-Length Product; MEPS: Mayo Elbow Performance Score; MRI: Magnetic Resonance Imaging; MSCT: Multislice Computed Tomography; PedsQL: Pediatric Quality of Life Inventory; QuickDASH: Abbreviated DASH questionnaire; ROM: Range of Motion; STROBE: Strengthening the Reporting of Observational Studies in Epidemiology; VAS: Visual Analog Scale.

Introduction.

The elbow is characterized by high articular congruence, complex capsuloligamentous organization, and close anatomical proximity of neurovascular structures. After fractures, dislocations, surgery, or immobilization, intra-articular and extra-articular restrictions may develop because of osseous impingement, articular-surface deformity, capsular thickening and fibrosis, scar formation, and impaired musculotendinous gliding [1-3].

The clinical interpretation of restricted motion has additional implications in childhood. Remaining growth potential supports remodeling; however, a persistent deficit in flexion, extension, or forearm rotation can disrupt motor patterns, self-care, handwriting, play, and sports. Even when ROM is relatively preserved, pain, fear of movement, and weakness may limit real-life use of the limb [4].

Imaging is required to identify the dominant mechanism of contracture. Computed tomography is more sensitive than standard radiography for small osteophytes, loose bodies, and sites of osseous block, while 3D reconstruction facilitates spatial assessment of deformity [5]. Ultrasonography and elastography complement bone imaging by providing information on the capsule, scars, tendons, ligaments, and mechanical properties of muscle. MRI can be used when clarification of cartilage and periarticular soft-tissue status is required [6].

Outcome selection remains challenging. Goniometry captures biomechanics but does not indicate how effectively a child uses the arm in daily life. Pediatric elbow studies have used MEPS, QuickDASH or the full DASH questionnaire, pain scales, and quality-of-life measures [7-9]. ABILHAND-Kids evaluates predominantly bimanual activities [10], whereas PedsQL

assesses physical, emotional, social, and school functioning [11,12].

Most published studies address surgical treatment of persistent contracture and include relatively small pediatric samples [7,8,13-17]. A comprehensive baseline profile of a large cohort before rehabilitation has been studied less extensively. Such a profile is required for patient stratification, rational selection of loading, and correct interpretation of subsequent change.

The objective of this study was to describe the comprehensive baseline instrumental and functional profile of children with post-traumatic elbow contracture and to assess the concordance of objective joint function with upper-limb disability, manual ability, and quality of life. We hypothesized that morphological, biomechanical, and patient-oriented measures would be related but non-interchangeable and that the groups formed for follow-up would show no clinically important baseline imbalance.

Materials and Methods.

Study design and setting:

A cross-sectional analysis was performed using baseline data collected before rehabilitation within a prospective controlled study conducted in 2023-2025. The clinical site was the Samarkand Branch of the Republican Specialized Scientific and Practical Medical Center of Traumatology and Orthopedics. Reporting followed the STROBE recommendations [18]. This article does not evaluate rehabilitation effectiveness and does not interpret between-group differences as treatment effects.

Participants and group formation:

The study consecutively enrolled 216 children and adolescents aged 6-16 years with clinically confirmed post-traumatic elbow contracture. An orthopedic trauma surgeon established the diagnosis when at least one movement remained restricted relative to the contralateral limb and the clinically expected age-specific range after the acute phase of injury. For subsequent follow-up, participants were assigned by non-randomized stratified matching for age, sex, and time since injury to the intervention group (n=102) or comparison group (n=114). The comparison group comprised children with the same condition and was not a healthy control group.

Eligibility criteria:

Inclusion criteria were age 6-16 years; post-traumatic contracture after fracture, dislocation, or surgery; measurable restriction of flexion, extension, pronation, and/or supination; stable general health; and written informed consent from a parent or legal guardian. Exclusion criteria were neurological disorders associated with spasticity or marked motor impairment, active septic arthritis or osteomyelitis, other active infection or inflammation, decompensated comorbidity, recurrent injury during assessment, or inability to complete the functional instruments.

Instrumental assessment:

Standard radiography and MSCT of the affected elbow with 3D reconstruction were performed as part of clinically indicated assessment; no additional scanning was undertaken solely for research. MSCT was performed using a 16-slice Siemens Somatom Emotion-16 scanner with 16×0.75-mm collimation. Reports documented osseous block, humeral condylar deformity, joint-space narrowing, and osteophytes. Ultrasonography with elastography assessed capsular thickening, soft-tissue scarring, reduced muscle elasticity, and tendon or ligament structural abnormalities. A 1.5-T MRI examination was performed when clinically indicated, but descriptive MRI results were excluded from quantitative between-group analyses.

Morphological classification:

For additional clinical interpretation, findings were grouped into four categories. The osseous phenotype was defined by at least one osseous finding without soft-tissue findings; the soft-tissue phenotype by at least one soft-tissue finding without osseous findings; the combined phenotype by both osseous and soft-tissue findings; and the no-visible-change category by absence of all prespecified findings. Individual findings within a category could coexist.

Clinical and biomechanical assessment:

Active flexion, extension, pronation, and supination were measured with an electronic goniometer in standardized positions. Each movement was recorded two or three times, and the mean was analyzed. Extension was expressed as the extension deficit in degrees. Pain was assessed separately at rest and during movement using a 0-10 VAS; a facial visual scale was used in younger children.

Functional instruments:

MEPS was completed by a clinician and incorporated pain, ROM, stability, and activities of daily living; a higher score indicated better function. DASH was used as a 0-100 index of upper-limb disability, with higher scores indicating greater limitation. ABILHAND-Kids was completed by a parent or legal guardian and expressed on a 0-100 scale, with higher scores indicating better manual ability. The age-appropriate child self-report or parent-proxy version of PedsQL was used; higher scores indicated better quality of life.

Outcomes:

Primary outcomes were baseline ROM and total MEPS. Secondary outcomes were the frequency of prespecified structural findings, pain categories, DASH, ABILHAND-Kids, and PedsQL scores, and correlations among functional scales. Between-group comparison was used solely to evaluate baseline balance before follow-up.

Statistical analysis:

Analysis was performed on de-identified individual data. Continuous variables are reported as mean and standard deviation; categorical variables as number and percentage. Welch t tests were used for continuous between-group comparisons, with calculation of mean differences, 95% CIs, and Hedges g. Categorical variables were compared using chi-square or two-sided Fisher exact tests. Wilson 95% CIs were calculated for the overall prevalence of structural findings. Associations between total scale scores were evaluated with Spearman rank correlations, and 95% CIs were approximated using Fisher z transformation. Because the analysis was exploratory, p values were interpreted together with CIs and effect sizes and were not used to establish equivalence. Significance was two-sided

at p<0.05. Calculations were performed in Python using SciPy and statsmodels.

Data completeness and ethics:

Demographic, imaging, goniometric, pain, and functional-scale data were available for all 216 participants. No observations were excluded and no statistical imputation was used. The study complied with the Declaration of Helsinki. Written informed consent was obtained from parents or legal guardians, and age-appropriate assent was obtained from children. The protocol was approved by the Local Ethics Committee of Samarkand State Medical University (protocol No. 3, October 2023).

Results.

Participant characteristics:

All 216 enrolled children were included: 102 in the intervention group and 114 in the comparison group. Mean age was 11.2±3.0 years; 138 participants (63.9%) were boys and 78 (36.1%) were girls. The right elbow was affected in 126 children (58.3%) and the left in 90 (41.7%). Mean time from injury to assessment was 6.1±2.7 months. Initial injuries were supracondylar fracture in 140 children (64.8%), transcondylar fracture in 50 (23.1%), and dislocation or combined injury in 26 (12.1%). Before enrollment, 154 children (71.3%) had received conservative treatment and 62 (28.7%) had undergone surgery.

Baseline demographic comparability is summarized in Table 1. Age was examined both continuously and by four prespecified age strata, while sex distribution was compared between the two cohorts.

The groups were closely similar in age and sex. The 95% CI for the age difference included zero, and the standardized age difference was negligible. These findings support demographic balance, although lack of statistical significance does not constitute proof of equivalence.

Morphological profile:

The morphological profile was evaluated using MSCT, ultrasonography, and elastography. Structural findings were not mutually exclusive and could coexist in one child; their frequencies should therefore not be summed as separate categories.

The most frequent finding was joint-space narrowing in 28 children (13.0%), followed by osseous block and capsular thickening, each in 27 (12.5%). The largest percentage-point differences were observed for osseous block (4.2 points; 95% CI -4.7 to 13.1; p=0.412) and osteophytes (3.5 points; 95% CI -3.0 to 9.9; p=0.392). All CIs included zero.

For visual comparison of the two morphological profiles, the frequencies of individual osseous and soft-tissue findings are presented in Figure 1.

Figure 1 confirms the similar distribution of individual morphological findings. In the integrated classification, osseous-only changes were identified in 12 children in the intervention group (11.8%) and 13 in the comparison group (11.4%); soft-tissue-only changes in 10 (9.8%) and 11 (9.6%); and combined changes in 15 (14.7%) and 16 (14.0%), respectively. No prespecified structural finding was identified in 65 (63.7%) and 74 (64.9%) children. The four-category distribution did not differ (χ^2=0.036; p=0.998).

Clinical and functional measures:

Following instrumental assessment, baseline ROM and functional scale scores were compared. Mean flexion was 128.1±12.2° in the intervention group and 127.7±11.4° in the comparison group, corresponding to a difference of 0.4° (95% CI -2.8 to 3.6; g=0.03; p=0.804).

All 95% CIs for between-group differences included zero, and absolute Hedges g values did not exceed 0.20. The largest, but still small, baseline effect was observed for PedsQL (g=-

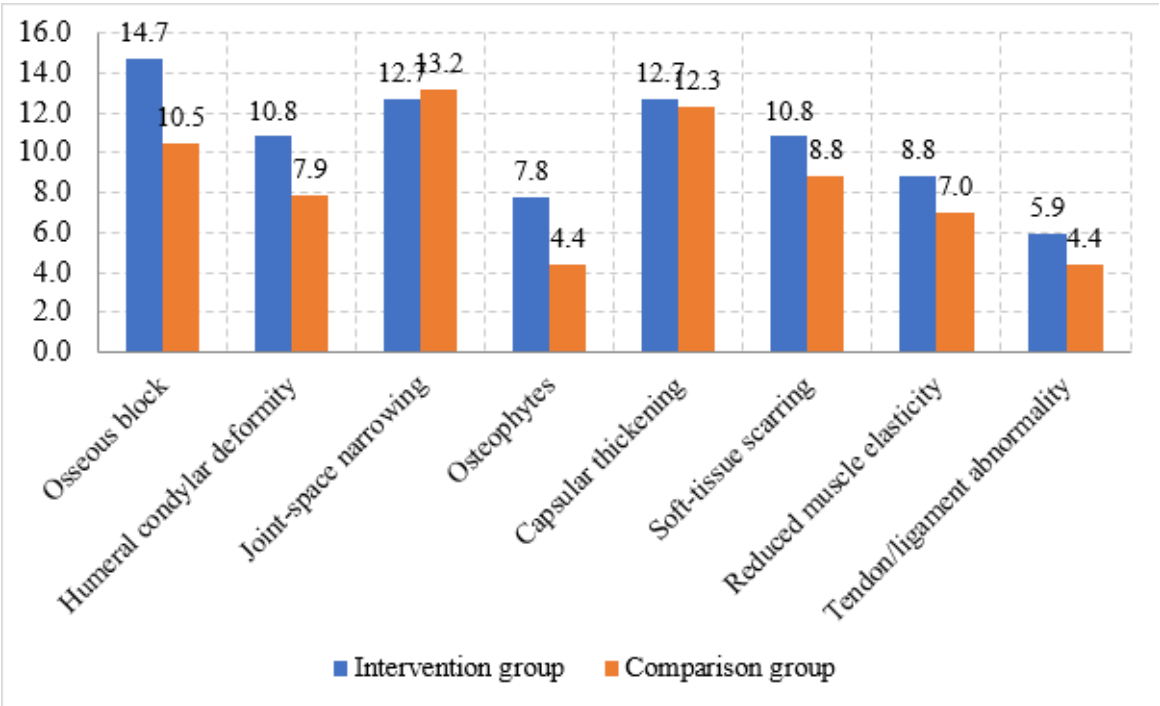


Figure 1. *Frequency of osseous and soft-tissue changes in the study groups.*

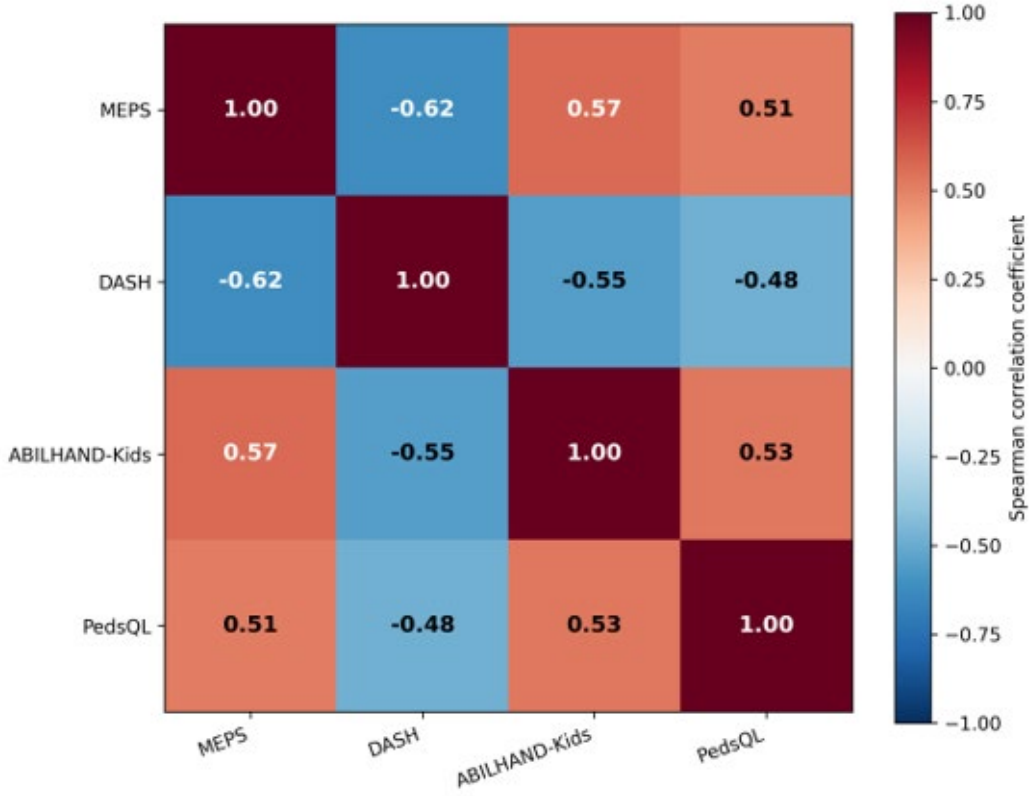


Figure 2. *Correlation matrix of the functional scales.*
Note: Blue indicates a positive correlation; red indicates a negative correlation. All off-diagonal correlations: p<0.001.

Table 1. *Baseline demographic characteristics of the groups.*

Variable	Intervention, n=102	Comparison, n=114	Total, n=216	p
Age, years	11.1±2.9	11.3±3.1	11.2±3.0	0.625
Boys, n (%)	65 (63.7)	73 (64.0)	138 (63.9)	0.962
Girls, n (%)	37 (36.3)	41 (36.0)	78 (36.1)	0.962
6-8 years, n (%)	19 (18.6)	21 (18.4)	40 (18.5)	1.000*
9-11 years, n (%)	32 (31.4)	36 (31.6)	68 (31.5)	
12-14 years, n (%)	34 (33.3)	38 (33.3)	72 (33.3)	
15-16 years, n (%)	17 (16.7)	19 (16.7)	36 (16.7)	

*Data are mean±standard deviation or n (%). *Overall chi-square test for four age categories: χ^2=0.002; p=1.000. The mean age difference was -0.2 years (95% CI -1.0 to 0.6); Hedges g=-0.07.*

Table 2. *Frequency of structural changes in the elbow joint.*

Structural finding	Intervention, n=102	Comparison, n=114	Total, n=216	p
Osseous block	15 (14.7)	12 (10.5)	27 (12.5; 95% CI 8.7-17.6)	0.412
Humeral condylar deformity	11 (10.8)	9 (7.9)	20 (9.3; 95% CI 6.1-13.9)	0.490
Joint-space narrowing	13 (12.7)	15 (13.2)	28 (13.0; 95% CI 9.1-18.1)	1.000
Osteophytes	8 (7.8)	5 (4.4)	13 (6.0; 95% CI 3.6-10.0)	0.392
Capsular thickening	13 (12.7)	14 (12.3)	27 (12.5; 95% CI 8.7-17.6)	1.000
Soft-tissue scarring	11 (10.8)	10 (8.8)	21 (9.7; 95% CI 6.4-14.4)	0.652
Reduced muscle elasticity	9 (8.8)	8 (7.0)	17 (7.9; 95% CI 5.0-12.2)	0.801
Tendon/ligament abnormality	6 (5.9)	5 (4.4)	11 (5.1; 95% CI 2.9-8.9)	0.759

Data are n (%). Overall prevalence CIs were calculated using the Wilson method; p values are two-sided Fisher exact tests.

Table 3. *Baseline clinical and functional measures.*

Measure	Intervention, n=102	Comparison, n=114	p	Difference (95% CI); Hedges g
Flexion, degrees	128.1±12.2	127.7±11.4	0.804	0.4 (-2.8 to 3.6); 0.03
Extension deficit, degrees	7.3±5.1	8.3±6.1	0.191	-1.0 (-2.5 to 0.5); -0.18
Pronation, degrees	74.4±10.4	73.7±9.5	0.608	0.7 (-2.0 to 3.4); 0.07
Supination, degrees	76.6±9.3	77.5±10.4	0.503	-0.9 (-3.5 to 1.7); -0.09
MEPS, 0-100	85.6±9.2	86.1±8.4	0.678	-0.5 (-2.9 to 1.9); -0.06
DASH, 0-100	21.6±7.3	20.9±6.7	0.465	0.7 (-1.2 to 2.6); 0.10
ABILHAND-Kids, 0-100	78.4±10.2	79.6±9.8	0.380	-1.2 (-3.9 to 1.5); -0.12
PedsQL, 0-100	81.3±8.4	82.9±7.4	0.141	-1.6 (-3.7 to 0.5); -0.20

Differences are intervention minus comparison. Higher scores indicate better function for MEPS, ABILHAND-Kids, and PedsQL, and greater disability for DASH.

Table 4. *Distribution of pain intensity on a 0-10 scale.*

Pain intensity	Rest: intervention	Rest: comparison	Movement: intervention	Movement: comparison
0, no pain	18 (17.6)	21 (18.4)	5 (4.9)	6 (5.3)
1-3, mild	64 (62.7)	70 (61.4)	36 (35.3)	38 (33.3)
4-6, moderate	18 (17.6)	20 (17.5)	54 (52.9)	58 (50.9)
7-10, severe	2 (2.0)	3 (2.6)	7 (6.9)	12 (10.5)

Data are n (%). Between-group distributions: pain at rest $\chi^2=0.138$, $p=0.987$; pain during movement $\chi^2=0.940$, $p=0.816$.

Table 5. *Correlations between functional indices.*

Measure	MEPS	DASH	ABILHAND-Kids	PedsQL
MEPS	1.00	-0.62*	0.57*	0.51*
DASH	-0.62*	1.00	-0.55*	-0.48*
ABILHAND-Kids	0.57*	-0.55*	1.00	0.53*
PedsQL	0.51*	-0.48*	0.53*	1.00

*Spearman correlation coefficients. *p<0.001. 95% CIs: MEPS-DASH -0.70 to -0.53; MEPS-ABILHAND-Kids 0.47 to 0.65; MEPS-PedsQL 0.40 to 0.60; DASH-ABILHAND-Kids -0.64 to -0.45; DASH-PedsQL -0.58 to -0.37; ABILHAND-Kids-PedsQL 0.43 to 0.62.*

0.20). Thus, lack of statistically significant differences was accompanied by no clinically substantial baseline imbalance.

Pain intensity:

Pain was analyzed separately at rest and during movement because load-related pain may limit active mobilization and the quality of exercise performance.

At rest, no or mild pain was reported by 82 of 102 children in the intervention group (80.3%) and 91 of 114 in the comparison group (79.8%). During movement, moderate or severe pain was reported by 61 (59.8%) and 70 (61.4%), respectively. No between-group difference was detected, but the high prevalence of load-related pain in both groups is directly relevant to mobilization dosing.

Correlations between functional indices:

The functional instruments showed internally coherent directions of association. MEPS correlated negatively with DASH and positively with ABILHAND-Kids and PedsQL. The complete Spearman correlation matrix is shown in Table 5.

The strongest association was between MEPS and DASH (r=-0.62), consistent with the opposite direction of these scales. The correlation between ABILHAND-Kids and PedsQL was r=0.53. No coefficient reached an absolute value of 0.70, indicating that the instruments capture related but distinct components of the child's condition.

The direction and magnitude of the Spearman coefficients are visualized in Figure 2.

The matrix confirms the strongest inverse relationship between MEPS and DASH and positive relationships of MEPS with manual ability and quality of life. The moderate coefficients (|r|=0.48-0.62) indicate partial rather than complete overlap among the measured constructs.

Discussion.

The main finding is that the baseline status of children with post-traumatic elbow contracture is determined by a combination of structural, biomechanical, pain-related, and patient-oriented components. Between-group differences were nonsignificant, all 95% CIs included zero, and standardized effects were small. These findings support baseline comparability of the two cohorts but do not formally demonstrate equivalence and do not characterize the effectiveness of subsequent rehabilitation.

The morphological profile was heterogeneous. Osseous block, articular-surface deformity, and joint-space narrowing represent mechanical restriction, whereas capsular thickening, scarring, and reduced muscle elasticity contribute to the soft-tissue component. Contemporary reviews classify stiffness as osseous, soft-tissue, or combined and recommend directing treatment toward the dominant mechanical barrier [1-3]. The present findings are consistent with this concept: a combined phenotype was identified in approximately 14% of children, while absence of prespecified structural findings in most participants highlights the possible contribution of pain, functional muscular imbalance, and subtle capsular change.

The relatively low frequency of osteophytes is expected in a pediatric cohort assessed at a mean of approximately six months

after injury. Nevertheless, even small osseous formations can restrict terminal motion. Alnusif et al. reported greater sensitivity of computed tomography than radiography for osteophytes and loose bodies [5]. Practical imaging algorithms recommend CT for spatial assessment of osseous impingement and non-ionizing modalities for soft-tissue clarification [6]. In pediatric practice, the indication for MSCT must always be balanced against radiation exposure.

Mean flexion approached the range required for many activities of daily living but did not exclude functional difficulty. Gates et al. showed that basic activities may require flexion to approximately 121°, while actual function also depends on forearm rotation and shoulder and wrist motion [4]. In this cohort, approximately 60% of children experienced moderate or severe pain during movement, which may limit active mobilization even when mean ROM appears relatively preserved.

Mean MEPS suggested good local elbow function, whereas DASH remained above zero and ABILHAND-Kids and PedsQL did not reach their maximum values. This divergence is expected because the tools assess different constructs. Nowotny et al. used ROM, VAS, the Oxford Elbow Score, MEPS, and QuickDASH concurrently in a pediatric arthroscopy series [8], and Quatman-Yates et al. demonstrated acceptable internal consistency of QuickDASH in older children and adolescents [9].

ABILHAND-Kids was originally developed for children with cerebral palsy [10]. Its use in the present post-traumatic cohort was exploratory and intended to capture bimanual daily activity rather than establish a diagnosis. Positive associations with MEPS and PedsQL support conceptual coherence, but future studies should undertake local psychometric validation or use an instrument specifically validated for pediatric upper-limb trauma.

PedsQL was related to both joint function and manual ability. In children with orthopedic conditions, the instrument distinguished patients with and without difficulty in daily life [11]. A clinically meaningful outcome in a child is therefore not limited to an increased movement angle and should include return to self-care, school, play, and sports.

Correlations between the scales do not demonstrate causality, prognostic value, or interchangeability. Coefficients of 0.48-0.62 represent moderate associations. MEPS is suitable for joint-specific clinical characterization, DASH for overall upper-limb disability, ABILHAND-Kids for bimanual activity, and PedsQL for multidimensional quality of life.

The practical value of a comprehensive profile lies in preliminary identification of the dominant mechanism of restriction. Osseous block or marked deformity warrants early orthopedic discussion and caution with forceful mobilization. A capsular-scar component may justify graded stretching, orthosis use, soft-tissue techniques, and pain control. When imaging abnormalities are minimal but functional impairment is marked, muscle coordination, fear of movement, adherence, and home-exercise performance should also be assessed.

Pediatric surgical series and a systematic review report improved ROM and MEPS after open or arthroscopic release for persistent severe contracture but emphasize heterogeneity of indications and outcomes [7,13-16]. This reinforces the importance of correct baseline stratification: treatment outcomes cannot be interpreted without considering the morphological substrate, pain, time since injury, and the child's functional requirements.

Study strengths include a relatively large pediatric cohort, complete baseline data, concurrent assessment of morphology, movement, pain, function, and quality of life, and presentation of CIs and effect sizes. These features improve the transparency of descriptive analysis and reduce the risk of interpreting a single p value outside its clinical context.

Clinical Implications.

At the initial stage of rehabilitation, ROM and pain measurement should be combined with assessment of the presumed morphological limiter. MEPS can characterize local elbow function; DASH, limitations of the entire upper limb; ABILHAND-Kids, bimanual activity; and PedsQL, effects on physical, emotional, social, and school functioning. MSCT should be used only when clinically indicated and according to the principle of the lowest necessary radiation exposure. Non-ionizing modalities are preferable for repeat assessment when they adequately address the clinical question.

Study Limitations.

- The study was conducted in one specialized center and represents a clinically selected rather than population-based cohort.
- Group allocation was non-randomized; baseline similarity does not exclude residual confounding by unmeasured factors.
- No formal a priori sample-size calculation was performed; all consecutive patients during the study period were analyzed.
- CTDIvol and DLP were not retained in the archived database, and independent blinded imaging review and interobserver reproducibility were not assessed.
- MEPS and DASH were originally developed primarily for adults, and ABILHAND-Kids for children with cerebral palsy; local linguistic and psychometric validation in this clinical population was not performed.
- Combining child self-report and parent-proxy PedsQL forms may have increased variability.
- No multivariable analysis adjusted for age, sex, time since injury, injury type, and previous surgery.
- The cross-sectional baseline analysis does not permit causal inference or evaluation of a specific rehabilitation program.

Future Research.

A multicenter longitudinal study with repeated morphological and functional assessment, a preregistered protocol, standardized radiation-dose recording, analysis of minimal clinically important changes, and multivariable adjustment is warranted. Age, time since injury, fracture type, previous surgery, and the psychometric properties of functional scales require separate investigation in pediatric post-traumatic cohorts.

Conclusion.

Post-traumatic elbow contracture in children is characterized by a heterogeneous combination of osseous, capsular-scar, muscular, and pain-related components. The most frequent baseline findings were joint-space narrowing, osseous block, and capsular thickening. Despite relatively preserved mean

ROM, a substantial proportion of children experienced moderate or severe pain during movement.

MEPS, DASH, ABILHAND-Kids, and PedsQL were moderately related but non-interchangeable. Small baseline between-group effects support comparability of the cohorts before different rehabilitation programs. Comprehensive assessment may guide baseline stratification and follow-up, but correlations should be interpreted as descriptive associations, and imaging and scale selection should account for age, radiation exposure, and methodological limitations.

Declarations.

Ethics approval: The protocol was approved by the Local Ethics Committee of Samarkand State Medical University (protocol No. 3, October 2023).

Informed consent: Written informed consent was obtained from parents or legal guardians; age-appropriate assent was obtained from the children.

Conflict of interest: The authors declare no conflicts of interest.

REFERENCES

1. Akhtar A, Hughes B, Watts AC. The post-traumatic stiff elbow: a review. J Clin Orthop Trauma. 2021;19:125-131.
2. Fan M, Xu F, Fei C, et al. Post-traumatic elbow stiffness: etiology, risk factors and current treatments. Front Surg. 2025;12:1643326.
3. Siemensma MF, van der Windt AE, van Es EM, et al. Management of the stiff elbow: a literature review. EFORT Open Rev. 2023;8:351-360.
4. Gates DH, Walters LS, Cowley J, et al. Range of motion requirements for upper-limb activities of daily living. Am J Occup Ther. 2016;70:7001350010p1-7001350010p10.
5. Alnusif NS, Matache BA, AlQahtani SM, et al. Effectiveness of radiographs and computed tomography in evaluating primary elbow osteoarthritis. J Shoulder Elbow Surg. 2021;30:S8-S13.
6. Lombard C, Teixeira P, Germain E, et al. Elbow stiffness imaging: a practical diagnostic and pretherapeutic approach. J Clin Med. 2021;10:5348.
7. Andelman SM, Walsh AL, Sochol KM, et al. Arthroscopic elbow contracture release in the pediatric patient. J Pediatr Orthop. 2018;38:e507-e513.
8. Nowotny J, Löbstein S, Biewener A, et al. Elbow arthroscopy in children and adolescents: analysis of outcome and complications. Eur J Med Res. 2018;23:42.
9. Quatman-Yates CC, Gupta R, Paterno MV, et al. Internal consistency and validity of the QuickDASH instrument for upper extremity injuries in older children. J Pediatr Orthop. 2013;33:838-842.
10. Arnould C, Penta M, Renders A, et al. ABILHAND-Kids: a measure of manual ability in children with cerebral palsy. Neurology. 2004;63:1045-1052.
11. Cheung PWH, Wong CKH, Cheung JPY. Comparative study of the use of Paediatric Quality of Life Inventory 4.0 generic core scales in paediatric patients with spine and limb pathologies. Bone Joint J. 2020;102-B:890-898.
12. Varni JW, Seid M, Kurtin PS. PedsQL 4.0: reliability and validity of the Pediatric Quality of Life Inventory version 4.0 Generic Core Scales in healthy and patient populations. Med Care. 2001;39:800-812.
13. Ek ETH, Paul SK, Hotchkiss RN. Outcomes after operative treatment of elbow contractures in the pediatric and adolescent population. J Shoulder Elbow Surg. 2016;25:2066-2070.
14. Onggo JR, Chua NSH, Onggo JD, et al. Clinical outcomes following surgical management of post-traumatic elbow contractures in the pediatric age group: a meta-analysis and systematic review. J Hand Surg Am. 2025;50:626.e1-626.e11.
15. Piper SL, Lattanza LL, Shen TS, et al. Open surgical release of posttraumatic elbow contracture in children and adolescents. J Pediatr Orthop. 2019;39:241-246.
16. Ruan JH, Cui HM, Sun ZY, et al. Midterm outcomes after open arthrolysis for posttraumatic elbow stiffness in children and adolescents. J Pediatr Orthop. 2021;41:e266-e271.
17. Santacaterina F, Di Filippo L, Lorusso M, et al. Management of post-traumatic elbow stiffness: a systematic review of randomized controlled trials with meta-analysis. Muscles Ligaments Tendons J. 2025;15:271-283.
18. von Elm E, Altman DG, Egger M, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Ann Intern Med. 2007;147:573-577.