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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 ВИНТИ 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 ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებშიდან.

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. Корректур авторам не высылаются, 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 computer-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 საყურადღებო!

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, შემავსებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიის ფოტოსურათები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების 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 ფხიხლებში 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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OPERATIVE VERSUS NONOPERATIVE MANAGEMENT OF SALTER-HARRIS TYPE II DISTAL RADIUS FRACTURES IN CHILDREN: A RETROSPECTIVE COHORT STUDY

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Abstract.

Background: Salter–Harris type II distal radius fractures are the most common physeal injuries in children. Although closed reduction and cast immobilisation are widely used, concerns about loss of reduction have led to increasing use of Kirschner wire fixation. The relative benefit of routine wire fixation following intraoperative reduction remains uncertain.

Methods: We performed a retrospective cohort study of 57 children aged 5–16 years treated for Salter–Harris type II distal radius fractures at a single centre between 2019 and 2024. All underwent manipulation under anaesthesia and were managed with either Kirschner wire fixation and cast immobilisation (n=30) or plaster of Paris immobilisation alone (n=27). Radiographic outcomes (radial inclination and volar tilt) were measured before surgery and at final follow-up. Within-group changes were analysed using paired t-tests and between-group differences using Welch's t-tests.

Results: Radiographic alignment improved significantly across the cohort. Volar tilt increased by a mean of +13.7° (95% CI 9.8–17.5, p<0.001) and radial inclination by +5.1° (95% CI 3.6–6.6, p<0.001). Both groups demonstrated significant within-group improvement, but between-group differences were small and not statistically significant (radial inclination Δ diff +1.5°, p=0.32; volar tilt Δ diff +1.9°, p=0.63). No complications, including pin-site infection or physeal arrest, were recorded.

Conclusion: Both Kirschner wire fixation and cast immobilisation following manipulation under anaesthesia produced satisfactory early radiographic outcomes in children with Salter–Harris type II distal radius fractures. Routine wire fixation is not required in every case and should be reserved for older children or fractures judged unstable at the time of reduction.

Key words. Salter–Harris II fracture, distal radius, Kirschner wire fixation, paediatric fracture, cast immobilization, orthopaedics.

Introduction.

Distal radius fractures are the most common fractures in children, accounting for up to one-third of all paediatric injuries [1]. Salter-Harris type II fractures, in which the fracture line extends through the physis and into the metaphysis, represent the most frequent physeal injury pattern [2]. These injuries usually result from low-energy trauma, such as a fall onto an outstretched hand [2].

Although closed reduction and cast immobilisation have traditionally been considered the standard of care, the optimal management of displaced Salter-Harris type II distal radius

fractures remains debated [3]. The high remodelling potential of the paediatric skeleton often allows satisfactory outcomes with non-operative treatment. However, concerns persist regarding loss of reduction, malunion, and the risk of growth disturbance [3]. As a result, percutaneous Kirschner wire fixation has been increasingly adopted, particularly in cases with marked displacement or suspected instability [4].

Previous studies have provided conflicting evidence. Some report improved maintenance of alignment with K-wire fixation, while others emphasise the risks of pin-site infection, physeal injury, and additional healthcare costs without a clear functional advantage [5]. Importantly, there is limited evidence directly comparing the outcomes of intraoperatively reduced fractures treated with either K-wire fixation or cast immobilisation alone [6].

The aim of this study was to compare the radiographic outcomes of Kirschner wire fixation versus plaster cast immobilisation following manipulation under anaesthesia for Salter-Harris type II distal radius fractures in children. We sought to determine whether routine wire fixation confers any measurable benefit over cast immobilisation in this setting.

Materials and Methods.

We conducted a retrospective cohort study of children aged 5–16 years who sustained Salter–Harris type II fractures of the distal radius and were treated at Stoke Mandeville Hospital, Aylesbury, between January 2019 and December 2024. Eligible cases were identified from the hospital trauma database and radiology records. Inclusion required closed reduction under general anaesthesia and a minimum radiographic follow-up of six weeks. Patients with open fractures, associated polytrauma, pathological fractures, incomplete medical records, or inadequate follow-up were excluded.

Treatment was determined by the operating surgeon. One group underwent manipulation under anaesthesia with percutaneous Kirschner wire fixation and cast immobilisation, while the other underwent manipulation under anaesthesia with plaster of Paris immobilisation alone. All reductions were performed under fluoroscopic guidance in the operating theatre.

The primary outcomes were radiographic parameters—radial inclination and volar tilt—measured on standard anteroposterior and lateral radiographs before surgery and at final follow-up. Measurements were performed electronically by two independent observers, with discrepancies resolved by consensus.

Data were entered into a secure database and analysed using IBM SPSS Statistics (IBM Corp., Armonk, NY). Continuous

variables were summarised as mean $\pm$ standard deviation or median with interquartile range, as appropriate. Within-group changes were assessed using paired t-tests; between-group differences in change (Δ = post – pre) were analysed using Welch’s t-tests. Categorical variables were compared with the chi-square test. A two-tailed $p < 0.05$ was considered statistically significant.

Results.

A total of 57 children met the inclusion criteria (MUA + K-wire, $n=30$; MUA/POP, $n=27$). The mean age was 11.7 years (range 5–16). Baseline demographic and preoperative radiographic parameters were comparable between the two groups.

For the overall cohort, alignment improved significantly following treatment. Volar tilt moved from dorsiflexed to near-neutral (mean change $+13.7^\circ$, 95% CI 9.8–17.5, $p < 0.001$), and radial inclination increased (mean change $+5.1^\circ$, 95% CI 3.6–6.6, $p < 0.001$) (Table 1). Median values showed a similar shift, with narrower postoperative ranges suggesting more consistent alignment across patients.

When analysed by treatment group, both strategies produced significant within-group improvements (Table 2). In the K-wire cohort, the average gain in volar tilt was approximately 14.6° and in radial inclination 5.8° ; in the MUA/POP cohort, the respective gains were 12.7° and 4.3° . Although improvements were numerically greater in the K-wire group, between-group differences were small and not statistically significant (radial inclination Δ diff $+1.5^\circ$, $p=0.32$; volar tilt Δ diff $+1.9^\circ$, $p=0.63$).

No complications were recorded. Specifically, there were no cases of pin-site infection in the K-wire group (0/30) and

no physal arrest observed in either cohort (0/57). Figure 1 illustrates the pre- and postoperative mean values with 95% confidence intervals.

Discussion.

Salter–Harris type II fractures of the distal radius are among the most frequent injuries encountered in paediatric orthopaedics [1,2]. The principal debate in their management is whether percutaneous fixation following a successful closed reduction provides measurable benefit over cast immobilisation alone [5,8]. In this retrospective cohort, both strategies resulted in satisfactory radiographic outcomes, with no significant differences between groups.

The improvement in both radial inclination and volar tilt across the entire cohort reflects the effectiveness of closed reduction in restoring alignment. Importantly, our findings suggest that routine Kirschner wire fixation after manipulation under anaesthesia is not essential in all cases. Both treatment groups maintained acceptable postoperative alignment, and no complications such as physal arrest or pin-site infection were observed.

Previous studies have reported that fracture stability is influenced by patient age and initial displacement [6]. Rivera et al. highlighted that older children, particularly those with coronal angulation exceeding 5° , are more likely to experience loss of reduction when treated non-operatively [7]. Similarly, surgical stabilisation has been advocated for patients approaching skeletal maturity or in cases where closed reduction was insufficient [8]. Our cohort had a mean age of 11.7 years, representing a transitional growth phase where remodelling potential begins

Table 1. Median values showed a similar shift, with narrower postoperative ranges suggesting more consistent alignment across patients.

Parameter	Pre-op mean $\pm$ SD	Post-op mean $\pm$ SD	Δ (post–pre), 95% CI	p
Volar tilt ($^\circ$)	-11.26 ± 13.58	2.40 ± 6.64	$+13.67$ (9.84–17.49)	1.94×10^{-9}
Radial inclination ($^\circ$)	14.14 ± 6.29	19.21 ± 4.48	$+5.07$ (3.58–6.56)	7.47×10^{-9}

Table 2. When analysed by treatment group, both strategies produced significant within-group improvements.

Parameter	Group (n)	Pre-op mean $\pm$ SD	Post-op mean $\pm$ SD	Δ (post–pre), 95% CI	p (within)
Radial inclination ($^\circ$)	K-wire (30)	13.27 ± 6.13	19.07 ± 4.40	$+5.80$ (4.01–7.59)	2.99×10^{-7}
	MUA/POP (27)	15.11 ± 6.44	19.37 ± 4.63	$+4.26$ (1.72–6.80)	0.00195
Volar tilt ($^\circ$)	K-wire (30)	-12.17 ± 13.77	2.40 ± 7.92	$+14.57$ (9.22–19.91)	5.11×10^{-6}
	MUA/POP (27)	-10.26 ± 13.55	2.41 ± 5.01	$+12.67$ (6.82–18.51)	1.41×10^{-4}

Preoperative and post-operative change/difference (Δ).

Figure 2. Radiographic outcomes in SH-II distal radius fractures

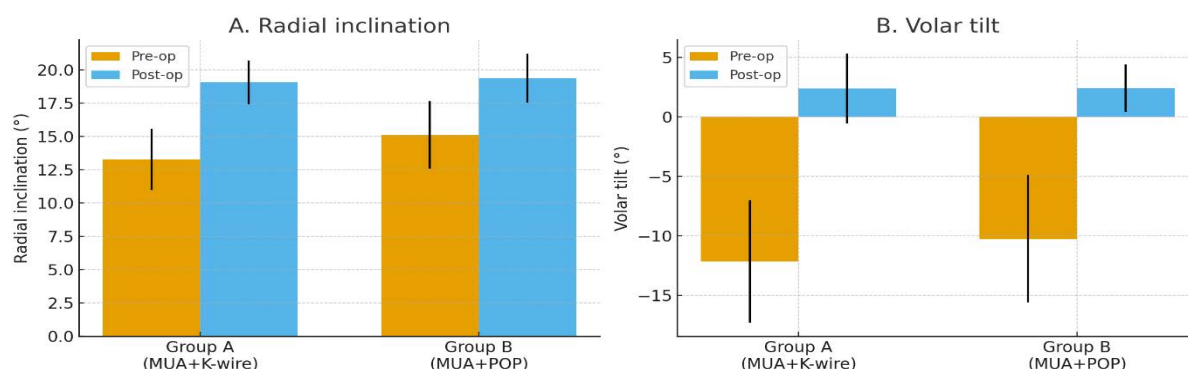


Figure 1. Illustrates the pre- and postoperative mean values with 95% confidence intervals.

to decline. Although our subgroup analysis did not demonstrate statistically significant differences between the groups, these considerations support selective use of Kirschner wire fixation in older children or in fractures considered unstable at the time of reduction.

Younger children, especially those under 10 years, exhibit significant remodelling potential, allowing greater tolerance of initial displacement and reducing the need for invasive stabilisation [9,10]. This remodelling ability means that satisfactory outcomes can often be achieved despite mild residual angular deformities. Conversely, in cases of suboptimal reduction—particularly when residual translation exceeds 10% or angulation is greater than 5°—percutaneous K-wire fixation may be required to prevent re-displacement and ensure stable healing [11]. This approach balances the benefit of stability with the potential risks of Kirschner wire use, such as pin-tract infection or nerve injury [12,13]. While percutaneous K-wire fixation has been recommended in unstable fracture patterns or in older children, some authors have argued for primary fixation even after satisfactory closed reduction, due to concerns about maintaining reduction stability [8].

The absence of major complications in our K-wire cohort is reassuring and supports its safe use when indicated. Nevertheless, avoiding unnecessary surgical intervention remains important, given the risks of infection, additional anaesthetic exposure, and healthcare costs described in other series. Although K-wires are inexpensive and widely available, they are not without potential issues, including rare complications such as wire breakage during removal [14].

It is also important to emphasise that small variations in radiographic parameters do not necessarily correspond to differences in clinical outcomes. Prior studies have shown that minor differences in volar tilt or radial inclination rarely affect long-term function, particularly in younger children with high remodelling potential [9,10]. Thus, the lack of statistically significant radiographic differences between groups in this study is unlikely to conceal clinically meaningful disparities, further supporting the conclusion that routine K-wire fixation is not required when a satisfactory reduction is achieved.

This study has several limitations. Its retrospective design introduces inherent risk of selection bias, as treatment allocation was determined by surgeon preference rather than randomisation. It is plausible that fractures judged less stable were preferentially assigned to the K-wire group. Although preoperative radial inclination and volar tilt were comparable between groups, other potentially relevant baseline characteristics—such as the degree of displacement, translation, or comminution—were not consistently recorded. The absence of these data limits our ability to fully evaluate allocation bias. The relatively small sample size further reduced statistical power, particularly for subgroup analyses by age or fracture pattern, and the study was not designed to detect small between-group differences. In addition, clinical outcomes such as pain, function, and return to activity were not consistently captured, restricting the analysis to radiographic parameters. Finally, follow-up was limited to early healing, without assessment of long-term remodelling or functional recovery.

Taken together, our findings support an individualised approach to management. While routine K-wire fixation following manipulation is not universally required, it may be considered in older children, in cases where sagittal alignment is difficult to restore, or in fractures demonstrating inherent instability at the time of reduction.

Conclusion.

Both manipulation under anaesthesia with plaster immobilisation and manipulation with Kirschner wire fixation are effective strategies for treating Salter–Harris type II distal radius fractures in children. In this series, both approaches achieved satisfactory early radiographic correction with no major complications, and there were no statistically significant differences between groups. Routine K-wire fixation is therefore not required in every case and should be reserved for older children or fractures that appear unstable at the time of reduction.

These findings reflect early radiographic outcomes, and further research with long-term follow-up is needed to determine whether subtle differences emerge in growth, remodelling, or functional recovery.

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