

Effectiveness of Hematoma Block in Term of Pain Relief in Distal Radial Fractures

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ABSTRACT

Objective: To find out effectiveness of hematoma block in term of pain relief in reduction of distal radius fracture.

Methodology: This Cross sectional (descriptive) study was conducted in the Department of Orthopedics Surgery, Lady Reading Hospital, Peshawar from August 19, 2021 till February 18, 2022 on total of 150 patients aged 18-80 years of either gender presented to the emergency department with acute pain and deformity of radius, confirmed at x ray were enrolled using Consecutive non-probability sampling. Study was conducted after approval of hospital ethical committee and written informed consent of patients. Reduction was done using hematoma block and post- procedure VAS was checked to determine effectiveness of hematoma block. Data was entered and analyzed using SPSS 20.

Results: In our study total 150 patients were enrolled with mean age of 43.72 ± 17.6 years. There were 49.3% patients from younger age group (18-40 years) and 50.7% from elder age group (41-80 years). There were 64% males and 36% female patients. Hematoma block was effective in 68% patients

Conclusion: Hematoma block is effective in reducing pain after reduction of distal radius fracture

Keywords: Block, Effectiveness, fracture, Hematoma, Radius.

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INTRODUCTION

One-sixth of all fractures seen in emergency departments are distal radius fractures, which are exceedingly prevalent.¹⁻⁴ Elderly people and children are more frequently involved. These fractures are more common in women, occur more frequently as people age, and are more commonly the consequence of low energy falls than high energy injuries. In most cases, the patient presents with a fall on an extended hand and a classic dinner fork deformity.^{1,4,5} Fractures that cannot be reduced by a closed technique need for internal fixation and open reduction⁶.

The process of reducing a fracture hurts. Anesthesia is used to keep patients from hurting and to help them become more cooperative and calm so that fracture reduction procedures may be carried

out more successfully⁷. The characteristics of the best analgesia during reduction are dictated by affectivity, affordability, simplicity, safety, and simplicity. Simpler alternatives to traditional anesthesia have been attempted since it is logistically challenging to provide such anesthesia to such a large number of patients requiring treatment at peripheral installations³.

Several analgesic techniques are employed to lessen the patient's discomfort throughout the process. These include of hematoma block, demand-valve nitrous oxide, intramuscular sedation, conscious sedation, and intravenous regional anesthesia (IVRA)^{1,3}. Complications from all of these techniques include depression of the central nervous system and heart, respiratory depression, nausea, vomiting, and lethargic post-reduction. In addition to potential side effects, the administration of intravenous sedation

and general anesthesia need nursing and/or medical personnel's monitoring. It prolonged hospital stays for patients, especially in cases where sedation-related issues arise^{8,9}. It is commonly known that there are significant risks associated with anesthetic leakage from a poorly controlled Bier's block due to an inadequate cuff.

As opposed to other methods, hematoma block reduces hospital stays, is more cost-effective, and offers superior pain management when it comes to reducing distal radius fractures. With hematoma block in reduction of distal radius fracture, a prior study found that 51.43% of patients experienced no pain, 34.28% mild pain, and 8.57% significant pain⁴.

The most frequent fracture seen in emergency rooms of orthopedic units is the distal radius fracture; although general anesthesia and intravenous sedation prolong hospital stays and might cause problems, they are nonetheless often used in our setting. The usefulness of hematoma block in terms of pain management for distal radius fractures has not been well studied locally. It's possible that research findings from other nations won't apply to our people. If the hematoma block proves to be successful, the findings will be shared with other orthopedic surgeons so they may serve as recommendations.

METHODOLOGY

This cross-sectional (descriptive) study was conducted on 150 patients in the orthopedic surgery department of the Lady Reading Hospital in Peshawar between August 19, 2021, and February 18, 2022. The sample size was determined using WHO software, which yielded a 51.43% proportion of patients reporting no pain, a 95% confidence interval, and an 8% margin of error. This study employed a consecutive non-probability sampling approach.

Patients aged between 18 to 80 years of either sex. Who presented to the emergency department with acute pain and deformity of radius, confirmed at x ray. Those patients with a simultaneous fracture, multisystem multiple trauma, Distal Neural injury, Dermal infection of the wrist, Hemorrhagic disorders, Allergies to the drugs administered during this study, Addicted individuals, and those requiring reduction in more than a joint were excluded.

Prior to submitting the summary to CPSP, authorization was obtained from the hospital ethics committee. The study included all patients who visited an orthopedic emergency room with wrist trauma, a distal radius fracture based on

anterioposterior and lateral radiographs, and who met all inclusion requirements. Clinically excluded were all patients who possessed any aspect of the exclusion criteria. They participants completed an informed consent form after being told about the study's goals and methods.

1.5% Lidocaine (4.5 mg/kg body weight) was applied to the patients at the dorsal side of the fracture hematoma location. The portion was painted with Spirit (95% alcohol) and then 7.5% povidone - iodine prior to the medication injection. A 20 ml disposable syringe with a 22 G needle will be used to administer the determined dosage of lidocaine. After aspirating one to two milliliters of hematoma blood, the fracture hematoma site was identified and the needle was inserted there. The prescribed dosage of lidocaine is then administered. Following the medication injection, the fracture site was not massaged. Five minutes later, the resident had reduced and immobilized the fracture. The patient was asked how they would rate their pain on a visual analogue scale at the beginning of the reduction phase. It was mentioned that the resident and the doctor, who were in charge of giving the injections and making the reductions, had to go through the required learning curve and only took part in the study after they were proficient enough to carry out the procedures.

Throughout the reduction period, blood pressure, pulse oximetry, and ECG monitoring were performed on each patient. Analgesia and intravenous sedative were utilized in case of a reduction failure.

The statistical analyses were carried out with the aid of SPSS 20. When dealing with continuous variables like age, mean + SD was computed. We computed percentages and frequencies for categorical factors such as effectiveness and gender. Age and gender stratification of effectiveness was used to observe effect change. Using the post-stratification chi square test, a p-value of less than 0.005 was considered significant. Tables and charts were used to display all of the results.

RESULTS

In our study total 150 patients were enrolled with mean age of 43.72 ± 17.6 years. (Table 1)

There were 49.3% patients from younger age group (18-40 years) and 50.7% from elder age group (41-80 years). (Table 2)

There were 64% males and 36% female patients (Table 3) . Hematoma block was effective in 68% patients (Table 4). Hematoma block was more

effective in elder age group as compared to younger age group i.e. 59.5% versus 76.3%, p- value 0.027. (Table 5)

Hematoma block was more effective in males as compared to females i.e. 81.2% versus 44.4%, p-value<0.001. (Table 6).

Table 1: Age of sampled population

	N	Minimum	Maximum	Mean	Std. Deviation
Age	150	18	80	43.72	17.670

Table 2: Age distribution in sampled population

Age groups	Frequency	Percent
18-40 years	74	49.3
41-80 years	76	50.7
Total	150	100.0

Table 3: Frequency of gender

Gender	Frequency	Percent
Male	96	64.0
Female	54	36.0
Total	150	100.0

Table 4: Efficacy of hematoma block

Efficacy	Frequency	Percent
Yes	102	68.0
No	48	32.0
Total	150	100.0

Table 5: Data stratification for age groups and efficacy

Age groups		Efficacy		Total
		Yes	No	
18-40 years	Count	44	30	74
	% within Age groups	59.5%	40.5%	100.0%
41-80 years	Count	58	18	76
	% within Age groups	76.3%	23.7%	100.0%
p-value 0.027 significant				

Table 6: Data stratification for gender and efficacy

Gender		Efficacy		Total
		Yes	No	
Male	Count	78	18	96
	% within Gender	81.2%	18.8%	100.0%
Female	Count	24	30	54
	% within Gender	44.4%	55.6%	100.0%
p-value <0.001 significant				

DISCUSSION

The most frequent fractures caused by osteoporosis in older women and men are distal radius fractures.¹⁰ These fractures are far more common in people over 70, accounting for 18% of all fractures. Two significant risk factors for distal radius fractures are age and sex.¹¹ Most often, elderly ladies with mild intensity trauma get these fractures.¹² According to available data, the risk of distal radius fractures in those over 60 is 2% for males and 15% for women. In emergency rooms, people with distal radius

fractures are treated with manipulation and reduction.¹³ In order to lessen the patient's discomfort during therapy procedures, many techniques are employed to generate analgesia. These techniques include hematoma block, demand-valve nitrous oxide, intramuscular sedation, conscious sedation, and intravenous regional anesthesia (IV RA).¹⁴

Every one of these analgesic techniques comes with certain hazards. Patients having any kind of anesthesia are at risk due to drug-induced responses and underlying cardiac conditions. In emergency

rooms, the hematoma block technique is rarely used; instead, general anesthesia and conscious sedation are frequently employed for the treatment of distal radius fractures. In youngsters, hematoma block has been linked to positive results. In contrast to procedural sedation, the use of hematoma block for the reduction of pediatric distal radius fractures produced satisfactory radiographic alignment, patient satisfaction, and pain management in a study by Bear et al.¹⁵⁻¹⁸. It might also greatly reduce the time and resources required for procedural sedation. The use of proper anesthetic techniques is crucial for senior individuals with several underlying disorders, however this strategy has not been examined in this population. When administering general anesthesia and sedation to those over 60 with various systemic disorders, there are increased hazards involved.¹⁹⁻²³

A total of 150 individuals with a mean age of 43.72 ± 17.6 years were recruited in our research. 50.7% of the patients were older (41–80 years), while 49.3% of the patients were younger (18–40 years). Of the patients, 36% were female and 64% were male. In 68% of patients, hematoma blockage was beneficial.

Hematoma block was more successful in the older age group (59.5% versus 76.3%, p-value 0.027) than in the younger age group. Male hematoma block was more successful than female hematoma block (81.2% versus 44.4%, p-value < 0.001).

An earlier research using hematoma block in reduction of distal radius fracture revealed no pain in 51.43%, mild discomfort in 34.28%, and significant pain in 8.57% of cases. In a different investigation, 68 senior citizens (average age of 70.3 ± 6.6) who had a displaced distal radius fracture that needed to be closed were included. In the early hours of the hematoma block, pain was less severe and varied from 7-8 on the VAS scale.¹⁹ In the Aniel-Quiroga et al. research.²⁴ In comparison to general anesthesia, hematoma blocking was shown to be more effective in reducing distal radius fractures. 96 patients, with a mean age of 54.3 (19–84) years, an M/F rate of 37/59, and a left/right hand ratio of 37/58, had displaced fractures of the distal radius. were incorporated. VAS was 2.25 ± 0.2 following reduction and there was no discomfort during hematoma block reduction.

Tseng et al.²⁵ contrasted procedural sedation (PSA) with hematoma block (HB). Although there was no difference in the pain severity during reduction between these two groups with significant heterogeneity, in the adult group, the effect of HB on

post-reduction pain severity was better than that of PSA with significant heterogeneity (Hedges' $g = 0.600$, 95% confidence interval (CI) – 1.170 to – 0.029, $p = 0.039$) (Hedges' $g = 0.356$, 95% CI – 1.101 to 1.812, $p = 0.632$). In the pediatric group, the treatment effect on pain severity was significantly better by HB than that by PSA but without significant heterogeneity (Hedges' $g = 0.402$, 95% CI – 0.718 to – 0.085, $p = 0.013$, $I^2 < 0.001\%$).

CONCLUSION

Although there may be some complications of haematoma block in distal radius fracture but its analgesia is a very effective method in distal radius close fractures reduction and application of cast splintage. Its economical and free of hazards of general anesthesia and can be applied in emergency room as well.

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REFERENCE

1. Myderrizi N, Mema B. The hematoma block an effective alternative for fracture reduction in distal radius fractures. *Med Arh.* 2015;65(4):239-42.
2. Baig A, Ahmad K, Humail M. Closed reduction and percutaneous Kirschner wire fixation of displaced colles fracture in adults. *Pak J Surg,* 2015;24:31-7.
3. Bajracharya S, Singh S, Singh GK, Singh M, Bajracharya T. The efficacy of the hematoma block for fracture reduction in the distal forearm fractures: a double blind randomized controlled trial. *Internet J Anesthesiol online different modalities of treatment in Colles' 2014 cited 2015 Nov 14.* Available from URL: http://www.ispub.com/ostia/index.php?xmlprinter=true&xml_File_path=Journals.
4. Ismatullah. Hamatoma block local anesthesia for closed reduction of Colles' type fracture. *JPMI.* 2015;25(1):56- 61.
5. Anjum MP, Hussain FN, Ali A, Mehboob 1. Post- operative wrist movement in percutaneous fixation by K-wire of Colles' fracture. *Med Channel* 2014;16:331-3.
6. Kakar HA, Makhdoom A, Laghari MA, Shah NH, Qureshi PAL, Siddiqui KA. Evaluation of different modalities of treatment in Colles' 2013 cited 2015 Nov 16. *Fractures. J Pak Orthop Associ* 2015;22:75-81.
7. Man KH, Fan KP, Chan TN, Yue YM. Prospective clinical trial comparing self-administered nitrous oxide and hematoma block for analgesia in reducing fracture of the distal radius in an emergency department. *Hong Kong J Emerg Med.* 2016;17:126-31.
8. Ng VK, Hames H, Millard WM. Use of intra-articular lidocaine as analgesia in anterior shoulder dislocation: a review and meta-analysis of the literature. *Can J Rural Med.* 2014;14(4):145-9.
9. Moharari RS, Khademohsseini P, Espandar R, Soleymani HA,

- Talebian MT, Khashayar P, Nejati A. Intra-articular lidocaine versus intravenous meperidine/diazepam in anterior shoulder dislocation: a randomized clinical trial. *Emerg Med J.* 2015;25:262-4.
10. Metz VM, Gilula LA. Imaging techniques for distal radius fractures and related injuries. *Orthop Clin North Am.* 1993 Apr. 24(2):217-28.
 11. Oyen J, Diamantopoulos AP, Haugeberg G. Mortality after distal radius fracture in men and women aged 50 years and older in southern Norway. *PLoS One.* 2014;9(11):112098. doi: 10.1371/journal.pone.0112098.
 12. Cummings SR, Melton LJ. Epidemiology and outcomes of osteoporotic fractures. *Lancet.* 2002;359(9319):1761-7.
 13. Bartl C, Stengel D, Bruckner T, Gebhard F. The treatment of displaced intra-articular distal radius fractures in elderly patients. *Dtsch Arztebl Int.* 2014;11(46):779-87.
 14. Padegimas EM, Osei DA. Evaluation and treatment of osetoporotic distal radius fracture in the elderly patient. *Curr Rev Musculoskelet Med.* 2013;6(1):41-6. doi: 10.1007/s12178-012-9153-8.
 15. Bear DM, Friel NA, Lupo CL, Pitetti R, Ward WT. Hematoma block versus sedation for the reduction of distal radius fractures in children. *J Hand*
 16. Maleitzke T, Plachel F, Fleckenstein FN, Wichlas F, Tsitsilonis S. Haematoma block: a safe method for pre-surgical reduction of distal radius fractures. *J Orthop Surg Res.* 2020 Aug 26;15(1):351. doi: 10.1186/s13018-020-01819-y. PMID: 32843043; PMCID: PMC7448324. Tabrizi A, Mirza Tolouei F, Hassani E, Taleb H, Elmi A. Hematoma Block Versus General Anesthesia in Distal Radius Fractures in Patients Over 60 Years in Trauma Emergency. *Anesth Pain Med.* 2016;7(1):e40619.
 17. Toshiwal R, Iqbal MZ, Ambulgekar R, Ghag NS, Bendale D, Chaware S. Hematoma Block as an Alternate Mode of Anesthesia for Management of Extra-Articular Distal End Radius Fracture with Percutaneous K-Wire Fixation in Emergency Department. *J Orthop Case Rep.* 2024 Nov;14(11):257-262. doi: 10.13107/jocr.2024.v14.i11.4986. PMID: 39524257; PMCID: PMC11546029.
 18. Tabrizi A, Mirza Tolouei F, Hassani E, Taleb H, Elmi A. Hematoma block versus general anesthesia in distal radius fractures in patients over 60 years in trauma emergency. *Anesth Pain Med.* 2016;7:e40619. - PMC - PubMed
 19. Alatishe KA, Ajiboye LO, Choji C, Idowu OS, Olanrewaju OS. A comparative study of the analgesic effect of haematoma block versus intravenous sedation for reduction of distal radius fractures in adults. *Int J Anesth Pain Med.* 2022;8:66-9.
 20. Lari A, Jarragh A, Alherz M, Nouri A, Behbehani M, Alnusif N. Circumferential periosteal block versus hematoma block for the reduction of distal radius and ulna fractures: a randomized controlled trial. *Eur J Trauma Emerg Surg.* 2023 Feb;49(1):107-113. doi: 10.1007/s00068-022-02078-8. Epub 2022 Aug 18. PMID: 35982326; PMCID: PMC9925527.
 21. Oakley B, Busby C, Kulkarni S, Arnold SJ, Kulkarni SS, Ollivere BJ. Manipulation of distal radius fractures: a comparison of Bier's block vs haematoma block. *Ann R Coll Surg Engl.* 2023 May;105(5):434-440. doi: 10.1308/rcsann.2022.0116. Epub 2022 Oct 14. PMID: 36239973; PMCID: PMC10149229.
 22. Maleitzke T, Plachel F, Fleckenstein FN, Wichlas F, Tsitsilonis S. Haematoma block: a safe method for pre-surgical reduction of distal radius fractures. *J Orthop Surg Res.* 2020 Aug 26;15(1):351. doi: 10.1186/s13018-020-01819-y. PMID: 32843043; PMCID: PMC7448324.
 23. Ruzicka A, Kaiser P, Schmidle G, Benedikt S, Kastenberger T, Arora R. Die konservative Behandlung der distalen Radiusfraktur [Conservative treatment of distal radial fractures]. *Oper Orthop Traumatol.* 2023 Dec;35(6):319-328. German. doi: 10.1007/s00064-023-00820-y. Epub 2023 Jul 5. PMID: 37407790.
 24. Aniel-Quiroga M, Fruner G, Monge-Baeza A, García-Toledo A, Liñán-Padilla A, Jiménez I. [Translated article] The haematoma block is not enough as method of anaesthesia in reduction of displaced distal radius fractures. *Rev Esp Cir Ortop Traumatol.* 2023 Sep-Oct;67(5):T371-T377. English, Spanish. doi: 10.1016/j.recot.2023.06.004. Epub 2023 Jun 11. PMID: 37311480
 25. Tseng PT, Leu TH, Chen YW, Chen YP. Hematoma block or procedural sedation and analgesia, which is the most effective method of anesthesia in reduction of displaced distal radius fracture? *J Orthop Surg Res.* 2018 Mar 27;13(1):62. doi: 10.1186/s13018-018-0772-7. PMID: 29580286; PMCID: PMC5869786.