International Journal of Research in Orthopaedics
Barman SC et al. Int J Res Orthop. 2024 Sep;10(5):914-920
http://www.ijoro.org

Original Research Article

DOI: https://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20242382

Comparison of the effectiveness between external fixations and conservative treatment for distal radial comminuted fracture

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Received: 14 July 2024
Accepted: 08 August 2024

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ABSTRACT

Background: Comminuted distal radial fracture is a potentially unstable fracture. It can be managed by external fixation and closed reduction with immobilization by plaster casting. But external fixation has better outcome than plaster casting. This study aimed to compare the effectiveness between external fixations and conservative treatment for distal radial comminuted fracture.
Methods: This prospective interventional study was carried out in the Department of Orthopaedic Surgery, Bangabandhu Sheikh Mujib Medical University from March, 2013 to September, 2015. 30 patients of distal radial comminuted fracture were selected. Total patients were divided into two groups. In Group A patients were treated by external fixation and in group B patients were treated by plaster cast.
Results: In this study, out of 30 patients, majority were male (60%). Mean age was 38.93(±10.45) years in group A and 40.66(±11.04) years in group B. Left side involvement was more 17 (56.7%) than right side 13 (43.3%). After 12 weeks, final follow up in group A 08 (53.3%) patients were recovered with excellent outcome. In group B 06 (40%) patients were recovered with excellent outcome. In group A, 14 (93.3%) patients were satisfactory outcome and in group B, 13 (86.7%) patients were satisfactory outcome.
Conclusions: External fixator decreases the complications of re-displacement and shortening for the treatment of comminuted distal radial fracture. It gives more satisfactory radiological, functional and clinical outcome as compared to cast immobilization.

Keywords: Conservative treatment, Distal radial comminuted fracture, Effectiveness, External fixations

INTRODUCTION

Distal radius fractures are the most common fractures seen in the emergency department; they represent approximately 3% of all upper extremity injuries.[1] It also represent one-sixth of orthopaedics emergency room visits.[2] There is a bimodal distribution of these injuries, with a peak in young adult, predominantly male population who sustain athletic and high-energy injuries and a second peak in the elderly, predominantly female population characterized by lower-energy or "fragility" fractures.[3] Distal radial comminuted fracture associated with pain and swelling around the wrist joint and deformity.[4] If distal radial comminuted fracture remain untreated may develop deformity, reduction of pronation, supination, weakness of hand, long-term swelling and pain and permanent finger stiffness.[5,6] The common injury mechanism that results in a fracture of the comminuted distal radius is a fall on to the outstretched hand from standing height, although a small proportion of patients will experience high energy injury.[7] Young adults usually sustain this injury as a result of high-energy trauma, such as a road traffic accident. In older adults, especially females, the fracture more often results from low-energy or moderate trauma, such as falling from standing height. This reflects the greater fragility of the bone, resulting from osteoporosis. It has been estimated that, at 50 years of age, a white woman in the USA or Northern Europe has a 15% lifetime risk of a distal radius

fracture whereas a man has a lifetime risk of just over two per cent.[8] Distal radial comminuted fracture can be managed by closed reduction with immobilization by plaster cast and external fixation. But closed reduction with cast immobilization associated with carpal tunnel syndrome, reflex sympathetic dystrophy, wrist stiffness, deformity, secondary osteoarthritis and dysfunction. To reduce the frequency of these complications various surgical methods like external fixation, internal fixation with volar plate and percutaneous K wire fixation.[6] The incidence of comminuted fractures of the distal radius is on rise because of increasing automobile accidents and increasing mechanization.[9] These injuries are also increasing with an increase in aging population as osteoporosis becomes prevalent in old age.[10] Traditionally these fractures are managed by closed reduction and casting which is associated with re-displacement. There is controversy regarding the best method of treatment of comminuted fracture of distal radius.[11] In the last century, most distal radial fractures in adults were treated conservatively by reduction of the fracture when displaced and stabilization in a plaster cast or other external brace. The results of such treatment, particularly in older people with bones weakened by osteoporosis are not consistently satisfactory.[12] External fixation is one of the good methods of treatment for distal radial comminuted fracture. Typically this is a closed, minimally invasive method where, in contrast to open surgery, the fractured bone ends are not exposed to direct view. Metal pins are driven into bone, generally via small incisions of the skin and after drilling, on either side of the fracture. Fracture reduction or alignment of the bony fragments is generally achieved by closed means, often in the process of applying external fixation. Reduction may be assisted by the application of a percutaneously (through the skin) inserted wire as a ''joy stick'' to move the bony fragments back into place.[13] External fixation is an acceptable surgical solution for the treatment of comminuted distal radius fractures as compared to cast immobilization. It maintains length and alignment of the fracture during healing and helps in restoring normal function6.[6] The purpose of the study was to compare the efficacy of closed reduction and plaster cast immobilization with external fixation for the treatment of comminuted distal radial fracture. Also, to compare the effectiveness between external fixations and conservative treatment for distal radial comminuted fracture.

METHODS

This prospective interventional study was carried out in the Department of Orthopaedic Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, from March, 2013 to September, 2015. A questionnaire was prepared considering the key variables like age, sex, side, nature of trauma, presenting symptoms, clinical findings, previous treatments, investigations, pre-procedure findings and outcome of procedure which were verified by the guide. Purposive type of non-probability sampling technique was used as according to availability of the patients and strictly considering the inclusion and exclusion criteria. All closed unstable proximal phalanx fracture of distal radius was the inclusion criteria Total 30 patients were divided into two groups. Duration of injury of selected patients was 1to 14 days. Group A was treated by universal mini external fixator and group B was treated by plaster cast. Aims, objectives, procedures, risks and benefits of the study were explained to the patient's and their legal guardians. They were encouraged for voluntary participation. They were also assured about the secrecy of information and records. The written informed consent was taken from each patient. After proper counseling and anesthesia fitness in case of group-A, patients were operated. Post-operative follow-up was given at 01 week, 02 weeks and 04 weeks, 06 weeks, 08 weeks and 12 weeks. The quantitative data will be expressed as mean and standard deviation and qualitative data as frequency distribution and percentage. Data were processed and analyzed using Computer based SPSS (statistical package for social science) soft-ware for windows, version 21. P value of less than 0.05 will be considered as significant.

RESULTS

Table 1 presents baseline characteristics of the study people. Mean age 38.93(±10.45) years in group A and 40.66 (±11.04) years in group B. Maximum incidence 06 (40.0%) between 31-40 years in group A. Maximum incidence 05 (33.3%) between 31-40 years and 41-50 years in each in group B. Most suffering patients were between 31 to 40 years old. In group A, 10 (66.7%) patients were male and 05 (33.3%) patients were female. In group B 08 (53.3%) was male and 07 (46.7%) was female. Male:female ratio 3:2. Male were more sufferer than female. In group A, office worker 06 (40.0%), housewife 05 (33.3%), manual worker were 02 (13.3%) student 01 (6.7%) businessman 01 (6.7%). in group B, office worker 05 (33.3%), housewife 05 (33.3%), manual worker were 02 (13.3%), student was 01 (6.7%), businessman 02 (13.3%). Maximum patients were office worker and housewife. In group A 06 (40.0%) of patient had right side and 09 (60.0%) had left sided. In group B 07 (46.67%) had right side and 08 (53.3%) had left sided. So the study showed involvement was more on the left side.

Table 2 shows that in Group- A, majority of the procedure was done between 8-14 days of injury which was 10 (66.67%). In group B most of the patients were treated between 1-3 days of injury which was 14 (93.3%). ($p<0.05$) that was statistically significant. The fracture configuration according to AO-ASIF classification, in Group A, maximum patients were 13 (86.7%) were 23C. In group B maximum patients 7 (46.6%) were also 23C. Out of 30 patients 20 patients were 23C.

Table 3 shows mean Volar tilt pre and post procedure 7.00(±0.84) and9.53(±0.83) respectively in Group A and 6.06(±0.70) and 7.0(±0.84) degree respectively in Group B. ($p<0.05$) that was statistically significant. Mean radial height pre and post procedure was 5.73(±1.03) mm and 9.06 (±0.88) mm respectively in Group A and 6.27(±0.70)

mm and 7.73(±1.03) mm respectively in Group B. The difference was statistically significant (p<0.05). Mean articular incongruity pre and post procedure was 1.98(±0.32) mm 1.15(±0.17) mm respectively in Group A and 1.65(±0.23) mm and 1.21(±0.24) mm respectively in group B. There was no statistically significant difference (p>0.05). Mean radial inclination in pre and post procedure was 11.67(±1.34) degree and 17.40(±0.91) degrees respectively in Group A and 11.13(±0.99) degree and 14.40(±0.82) degrees respectively in Group B. The difference was statistically significant (p<0.05).

Table 1: Baseline characteristics of the study people (n=30).

Characteristics	Group A (n=15)	Group B (n=15)	Total (n=30)	P value
	N (%)	N (%)	N (%)	
Age (in years)				
21-30	04 (26.7)	03 (20.0)	07 (23.3)	0.86^{ns}
31-40	06 (40.0)	05 (33.3)	11 (36.7)	
41-50	03 (20.0)	05 (33.3)	08 (26.7)	
51-60	02 (13.3)	02 (13.3)	04 (13.3)	
Mean±SD	38.93(±10.45)	40.66(±11.04)	39.80(±10.60)	0.66^{ns}
Sex				
Male	10 (66.7)	08 (53.3)	18 (60)	0.45^{ns}
Female	05 (33.3)	07 (46.7)	12 (40)	
Occupation				
Office worker	06 (40.0)	05 (33.3)	11 (36.7)	0.98^{ns}
House wife	05 (33.3)	05 (33.3)	10 (33.3)	
Manual worker	02 (13.3)	02 (13.3)	04 (13.3)	
Student	01 (6.7)	01 (6.7)	02 (6.7)	
Businessman	01 (6.7)	02 (13.3)	03 (10.0)	
Side				
Right	06 (40.0)	07 (46.67)	13 (43.3)	0.71^{ns}
Left	09 (60.0)	08 (53.3)	17 (56.7)	

Statistical analysis was done by Chi-square test, p value <0.05 indicates significant, ns= not significant

Table 2: Interval between injury and fixation and fracture union time of the study groups (n=30).

Parameter	Group A (n=15)	Group B (n=15)	Total (n=30)	P value
	N (%)	N (%)	N (%)	
Interval between injury and fixation				
1-3 days	01 (6.67)	14 (93.3)	15 (50.0)	<0.001^{s}
4-7 days	04 (26.67)	01 (6.67)	05 (16.67)	
8-14 days	10 (66.67)	0	10 (33.3)	
Fracture union time				
7-8 weeks	03 (20)	5 (33.3)	8 (26.7)	0.70^{ns}
9-10 weeks	8 (53.3)	7 (46.7)	15 (50.0)	
>10 weeks	4 (26.7)	3 (20)	7 (23.3)	

Statistical analysis was done by Chi-square test, p value <0.05 indicates significant, ns= not significant

Table 3: Radiological findings in both groups (n=30).

Radiological findings	Group A (n=15)		P value	Group B (n=15)		P value
	Mean±SD			Mean ±SD		
	Pre	Post		Pre	Post	
Volar tilt (degrees)	7.00(±0.84)	9.53(±0.83)	<0.001	6.06(±0.70)	7.0(±0.84)	0.002^{s}
Radial height (mm)	5.73(±1.03)	9.06(±0.88)	<0.001	6.27(±0.70)	7.73(±1.03)	0.001^{s}
Articular incongruity (mm)	1.98(±0.32)	1.15(±0.17)	<0.001	1.65(±0.23)	1.21(±0.24)	<0.001^{s}
Radial inclination (degrees)	11.67(±1.34)	17.40(±0.91)	<0.001	11.13(±0.99)	14.40(±0.82)	<0.001^{s}

Statistical analysis was done by Chi-square test, p value <0.05 indicates significant, s= significant

Table 4 demonstrates the comparison between pre and post procedure clinical status of the patients according to Green

and O'Brien scoring system with study group modified by Cooney et al.[14] There was significant improvement of all parameters that were compared.

Table 5 presents the comparison of outcome status of the study groups. Majority patients 08 (53.3%) had resumed work in Group A and 08 (53.3%) in Group B. Patients who were constrained work 06 (40%) in Group A and 06 (40%) in Group B. Able to work but failed to be employed 1 (6.7%) was in each group. In group A, 14 (93.3%) results was satisfactory and 1 (6.7%) results was unsatisfactory. In group B, 13 (86.7%) patients improvement was satisfactory and 2 (13.3%) patients improvement was unsatisfactory. According Green & O" Brien Scoring System 04 category was subdivided -excellent: 90-100; good: 80-89; fair: 65-79; poor: <65. After 12 weeks final follow up in group A 08 (53.3%) patients recovered with excellent outcome, 05 (33.5%) patients with good outcome, 01 (6.7%) with fair outcome and 01 (6.7%) poor outcome was in group A. In Group B 6 (40.0%) patients were recovered with excellent outcome, 05 (33.3%) with good outcome, 02 (13.3%) with fair outcome and 2 (13.3%) patient was poor outcome.

Table 4: Comparison between pre and post procedure clinical status of the patients according to Green and O'Brien scoring system with study group modified by Cooney et al[14] (n=30).

Radiological findings	Group A (n=15)		P value	Group B (n=15)		P value
	Mean ±SD			Mean ±SD		
	Pre-procedural score	Post-procedural score		Pre-procedural score	Post-procedural score	
Pain	13.0(±5.27)	23.0(±2.53)	<0.001	14.0(±3.87)	22.66(±3.19)	<0.001[s]
Functional status	13.0(±5.27)	22.66(±2.58)	<0.001	13.0(±5.27)	22.66(±2.58)	<0.001[s]
Range of motion	8.33(±2.43)	22.33(±4.57)	<0.001	7.33(±2.58)	19.33(±5.62)	<0.001[s]
Grip strength	7.66(±3.71)	21.33(±5.49)	<0.001	6.33(±3.99)	19.0(±7.12)	<0.001[s]

Statistical analysis was done by Chi-square test, p value <0.05 indicates significant, s= significant

Table 5: Comparison of outcome status of the study groups (n=30).

Parameter	Group A (n=15)	Group B (n=15)	Total (n=30)	P value
	N (%)	N (%)	N (%)	
Functional status				
Resumed work	08 (53.3)	08 (53.3)	16 (53.3)	1.0[ns]
Constrained work	06 (40.0)	06 (40.0)	12 (40.0)	
Able to work but failed to be employed	01 (6.7)	01 (6.7)	02 (6.7)	
Unable to work due to pain	0	0	0	
Satisfactory and unsatisfactory outcome				
Satisfactory	14 (93.3)	13 (86.7)	27 (90)	1.00[ns]
Unsatisfactory	1 (6.7)	02 (13.3)	03 (10)	
Results				
Excellent	08 (53.3)	06 (40.0)	14 (46.7)	0.28[ns]
Good	05 (33.3)	05 (33.3)	10 (33.0)	
Fair	01 (6.7)	02 (13.3)	03 (10.0)	
Poor	01 (6.7)	02 (13.3)	02 (6.7)	

Statistical analysis was done by Chi-square test, p value <0.05 indicates significant, ns= not significant

Table 6: Range of motion and grip strength of the study groups (n=30).

Parameter	Group A (n=15)	Group B (n=15)	Total (n=30)	P value
	N (%)	N (%)	N (%)	
Range of motion (% of normal)				
100	09 (60)	05 (33.3)	14 (46.7)	0.25[ns]
75-99	06 (40)	09 (60)	15 (50)	
50-75	0	01 (6.7)	01 (3.3)	
25-59	-	-	-	
0-24	-	-	-	
Grip strength (% of normal)				
100	6 (40)	05 (33.3)	11 (36.7)	0.67[ns]
75-99	8 (53.3)	07 (46.7)	15 (50)	

Continued.

Parameter	Group A (n=15)	Group B (n=15)	Total (n=30)	P value
	N (%)	N (%)	N (%)	
50-74	1 (6.7)	02 (13.3)	03 (10.0)	
25-49	0	01 (6.7)	01 (3.3)	
0-24	0	0	0	

Statistical analysis was done by Chi-square test, p value <0.05 indicates significant, ns= not significant

Table 7: Pain status and complications of the study groups (n=30).

Characteristics	Group A (n=15)	Group B (n=15)	P value
	N (%)	N (%)	
Pain status			
Absent	09 (60)	09 (60.0)	0.58^{ns}
Occasional	05 (33.3)	05 (33.3)	
Moderate to tolerable	01 (6.7)	01 (6.7)	
Severe intolerable	0	0	
Complication			
Deformity	02 (13.3)	06 (40.0)	0.21^{ns}
Carpal tunnel syndrome	0	01 (6.67)	1.0^{ns}
Mal-union	01 (6.67)	03 (20.0)	0.59 ^{ns}
Reflex sympathetic dystrophy	0	01 (6.67)	1.0 ^{ns}
Wrist stiffness	01 (6.67)	03 (20.0)	0.59 ^{ns}
Pin tract infection	01 (6.67)	0	1.0 ^{ns}

Statistical analysis was done by Chi-square test, p value <0.05 indicates significant, ns= not significant

According to Table 6, majority patients had normal range of motion 09 (60%) in Group A and 05(33.3%) in Group B. Followed by 06 (40%) range of motion between 75-99% in group A and 09 (60%) in Group B. 1 (3.3%) patient had range of motion 50-75% in group B. After 12 weeks final follow up in group A 6 (40%) patients grip strength was 100%, 8 (53.3%) was between 75-99% and 01 (6.67%) between 50-74% of grip strength. In Group B 05 (33.3%) patients grip strength was 100% followed by 07 (46.7%) between 75-99%, 02 (13.3%) between 50-74% and 01 (6.7%) between 25-49% of grip strength.

Table 7 shows the pain status and complications of the study groups. Majority patients 09 (60%) had no pain in Group A and 09 (60%) in Group B. Occasional pain had found 05 (33.3%) in Group A and 05 (33.3%) in Group B. Moderate to tolerable 01 (6.7%) was in each group. None was in severe intolerable pain in both groups. Deformity 02 (13.3%) was found in group A and 06 (40%) was found in group B. Mal-union, wrist stiffness and pin tract infection was 1 in each in group A. No carpal tunnel syndrome and reflex sympathetic dystrophy was seen in group A. 3 (20%) patients were suffering from Mal-union, 03 (20%), patient were suffering from wrist stiffness, 1 patient was suffering from carpal tunnel syndrome and 1 patient was suffering from reflex sympathetic dystrophy in group B ($p<0.05$) that was statistically significant.

DISCUSSION

In present study showed mean age 38.93(±10.45) years in group A and 40.66(±11.04) years in group B. Maximum incidence was 06(40%) between 31-40 years in group A. Maximum incidence 05 (33.3%) was between 31-40 years and 41-50 years in each in group B. In group A, 10 (66.7%) male and 05(33.3%) were female. In group B, 08 (53.3%) were male and 07 (46.7%) were female. Male female ratio was 3:2. Male patients were more sufferer than female. Similar results were found study of Azar et al, they showed the mean age of participants was 42.09±14.91 years, 40 (58.8%) men and 28 (41.2%) was women.[15] The external fixator group contained 37 patients, 22 males (59.5%) and 15 females (40.5%) with the mean age of 41.78 (±13.74) years and the plaster group included 31 patients 18 males (58.06%) and 13 females (41.93%) with the mean age of 43.9 (±17.91) years old. In current study in group A 06 (40.0%) of patient had right side and 09 (60.0%) had left sided. In group B, 07 (46.67%) had right side and 08 (53.3%) had left sided. So the study showed that involvement was more on the left side. Compared with Mostafa study, out of 28 cases the left side was involved in 19 patients.[16] In present study group A majority of the patients fracture union time between 9-10 weeks of injury which was 8 (53.3%) and group B majority patients fracture union time between 9-10 weeks of injury which was 7 (46.7%). Compared with Gupta et al study they showed average time to union was 7.4 weeks (5-11 weeks).[17] In another Mostafa study showed all fractures healed uneventfully after an average time of 7.7 weeks (range 6-9).[16] Our study shows mean Volar tilt pre and post procedure 7.00(±0.84) and 9.53(±0.83) respectively in Group A and 6.06(±0.70) and 7.0(±0.84) degree respectively in Group B ($p<0.05$) that was statistically significant. Mean radial height pre and post procedure was 5.73(±1.03) mm and 9.06 (±0.88) mm respectively in Group A and 6.27(±0.70) mm and 7.73(±1.03) mm respectively in Group B ($p<0.05$) that was statistically

significant. Mean articular incongruity pre and post procedure was 1.98(±0.32) mm 1.15(±0.17) mm respectively in Group A and 1.65(±0.23) mm and 1.21(±0.24) mm respectively in group B (p>0.05) that was not statistically significant. Mean radial inclination in pre and post procedure was 11.67(±1.34) degree and 17.40(±0.91) degrees respectively in Group A and 11.13(±0.99) degree and 14.40(±0.82) degrees respectively in Group B (p <0.05) that was statistically significant. In Ismatullah study showed Volar tilt in external fixation group was 5.7(±6.60) degrees and in conservative treatment Group volar tilt was 2.87(±10.14) degrees.[6] Radial height in external fixation group was 8.20(±1.74) mm and 6.00(±2.45) mm in conservative treatment group. Radial inclination in external fixation group 18.80(±1.78) degrees and in conservative treatment group 14.20(±3.53) degrees. Articular incongruity in external fixation group was 1.045(±.96) mm and 1.52(±.91) mm in conservative treatment group. In current study showed Mal-union, wrist stiffness and pin tract infection was 1 in each in group A. No carpal tunnel syndrome and reflex sympathetic dystrophy was seen in group A. 3 (20%) patients were suffering from Mal-union, 03 (20%) patient were suffering from Wrist stiffness, 1 (6.7%) patient was suffering from carpal tunnel syndrome and 1 (6.7%) patient was suffering from reflex sympathetic dystrophy in group B (p<0.05) that was statistically significant. Anderson et al have reported complications of external fixation in a series 24 patients as: 5 (21%) neuropathies (3 involving the median nerve (carpal tunnel syndrome) and 2 involving the superficial branch of the radial nerve), 9 (37.5%) pin tract infections, 2 (8.3%) pin loosening, 1 (4.2%) non-union and 2 (8.3%) mal-union.[18] Reflex sympathetic dystrophy was not documented in their series. In our study, with external fixation in 15 cases, there were 2 (13.3%) mal-union, 2 (13.3%) pin tract infection, 4 (26.6%) wrist stiffness and 1 (6.6%) reflex sympathetic dystrophy. In a study of Nakata et al, no case of post-operative neuropathy like carpal tunnel syndrome was found with external fixation.[19] Most of the complications of external fixation are avoidable if proper aseptic technique is used and physiotherapy exercises are instituted. In the study conducted by Kakar et al, the complications of plaster casting in 51 patients were: 13 (25.4%) mal-union, 2 (3.9%) carpal tunnel syndrome and 5 (9.8%) reflex sympathetic dystrophy.[20] In Ismatullah study showed plaster casting group of 15 cases, the complications were: 5 (33.3%) mal-union, 2 (13.3%) carpal tunnel syndrome, 3 (20%) wrist stiffness and 3 (20%) reflex sympathetic dystrophy.[6] The high rate of mal-union with plaster casting is compelling evidence to adopt alternative methods like external fixation because it may be difficult to treat once it develops. Our results were more in agreement with the studies conducted by Mehboob who reported infection had complicated up to 13.3% of their studies' population.[21] Azar et al found that in the external fixator group only 2 (5.4%) and in the plaster group only 6 (19.4%) had infection of the pin site.[15] Harley and Hatchinson et al reported that the pin and plaster was not as successful as external fixator.[22] According Green & O‟ Brien Scoring System modified by Cooney et al, 04 category was subdivided -excellent: 90-100; good: 80-89; fair: 65-79; poor: <65.[14] After 12 weeks final follow up in group A 08 (53.3%) patients recovered with excellent outcome, 05 (33.5%) patients with good outcome, 01 (6.7%) with fair outcome and 01 (6.7%) poor outcome was in group A. In Group B 6 (40.0%) patients were recovered with excellent outcome, 05 (33.3%) with good outcome, 02 (13.3%) with fair outcome and 2 (13.3%) patient was poor outcome. Patients by satisfactory and unsatisfactory outcome according to green and O'Brien Scoring System modified by Cooney et al.[14] In group A, 14 (93.3%) results was satisfactory and 1 (6.7%) results was unsatisfactory. In group B, 13 (86.7%) patients improvement was satisfactory and 2 (13.3%) patients improvement was unsatisfactory. Various national and international studies have shown superior results offered external fixation as compared to plaster casting in these fractures and our results are comparable with other series. In a study conducted by Abbaszadegan, there were 19 excellent or good results out of 22 cases, with external fixation, and 12 excellent or good results out of 19 cases, with plaster casting.[21] In another study conducted by Kakar, there were 64.2% excellent, 21.4% good, 14.2% fair and no poor results with external fixation and 31.3% excellent, 43.1% good, 15.6% fair and 9.8% poor results.[20] Our results, like the two series mentioned above, indicate that external fixation is preferable to plaster casting in comminuted fractures of the distal radius.

This study has few limitations. In our study, there was small sample size and absence of control for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. The study was conducted at a short period of time.

CONCLUSION

External fixator decreases the complications of re-displacement and shortening for the treatment of comminuted distal radial fracture. It gives more satisfactory radiological, functional and clinical outcome as compared to cast immobilization.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Barman SC, Musa M, Rahman M, Monir MM, Al Mamun A, Hannan MA. Comparison of the effectiveness between external fixations and conservative treatment for distal radial comminuted fracture. Int J Res Orthop 2024;10:914-20.