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ORIGINAL ARTICLE

Efficacy of Conservative and Surgical Techniques in the Management of Scaphoid Fractures: A Longitudinal Study

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ABSTRACT

Aim: The goal of this study was to assess the efficacy of conservative versus surgical treatment for acute scaphoid fracture.
Study design: A longitudinal study
Place and Duration: This study was conducted at Fauji Foundation Hospital, Rawalpindi, MMC college Mirpurkhas, BMCH Quetta, PHQ hospital Gilgit Pakistan from June 2020 to June 2021.
Methodology: A total of 60 acute scaphoid fractures (within three weeks) were included in this study, regardless of location. During the clinical examinations, diagnostic tests were done. Patients were urged to have wrist radiography check if any of these tests were positive. If radiography revealed no fracture, the wrist was immobilised with a below-elbow slab, and the patient was instructed to return in 15 days. After two weeks, the identical x-ray series was repeated
Results: During the study period, 60 cases of acute scaphoid fracture (< 3 weeks) were seen. The average age of patients was 36.5 years. There were n=48 (80%) male patients and n=12 (20%) female patients. A right-side fracture was found in 38 (63 %) of patients, while a left-side fracture was found in 22 (36 %). The most common type of injury was traffic accidents, but sports injuries, industrial injuries, domestic injuries, and assault injuries were also common. A total of 11 patients had poor results who were managed conservatively. Poor results were reported in 1 patient of the operatively managed patients.
Conclusion: As compared to conservative management, surgical technique had more favourable outcome. There were poor results in every fourth patient that was managed conservatively, while poor results were negligible in patients who were operatively managed.
Keywords: Scaphoid fracture, conservative and surgical management, treatment options

INTRODUCTION

Scaphoid bone fractures account for around 10% of all hand fractures, with a reported frequency of 29 per 100,000 people. About 16.5 % of all scaphoid fractures are Herbert A2 fractures (non-displaced unicortical waist fractures). (1) Articular cartilage covers more than 75 % of the scaphoid bone. The radial artery's dorsal carpal branch enters the scaphoid at a nonarticular ridge on the dorsal surface, supplying retrograde blood flow to the proximal 80% of the scaphoid. (2) The superficial palmar arch (branch of the volar radial artery), which serves the distal 20% of the scaphoid, penetrates the distal tubercle. The scaphoid flexes with wrist flexion and radial deviation and stretches with wrist extension and ulnar deviation due to intrinsic and extrinsic ligaments (same as a proximal row). (3)

Non-displaced scaphoid fractures have traditionally been treated conservatively, with the hand immobilised with a cast; however, surgical stabilisation of the fracture has grown in popularity due to the faster remobilization and return to its former function. However, this was weighed against the possibility of fracture surgery complications. Despite indications that operational treatment is safe, effective, and yields excellent results, (4)

Scaphoid fractures can be diagnosed with radiography, computed tomography, and magnetic resonance imaging. Anteroposterior views, lateral views, scaphoid views, oblique views, and clenched pencil views are all included in plain radiography. In roughly 25% of cases, the scaphoid is not apparent on first radiographs. (5) CT scans are particularly beneficial for resolving scaphoid non-union and monitoring healing after scaphoid surgery since they have a sensitivity of 92 % and a specificity of 92-95 %. (6) The efficacy of surgical and non-surgical treatment for acutely undisplaced or mildly displaced scaphoid fractures has recently been studied in clinical studies. (4, 7)

Scaphoid fractures usually require a significant observation period until the union is achieved or the therapeutic method is changed. Radiographs are collected and assessed for union or any problems at regular intervals. Hand and finger range of motion is also initiated from the beginning to achieve the optimal function as soon as possible and to reduce difficulties. (8) The goal of this study was to assess how well conservative and surgical therapies for scaphoid fractures worked.

METHODOLOGY

After receiving approval from the institutional ethics committee, this prospective comparative study was conducted for a year in different hospitals of Pakistan. This study included 60 acute scaphoid fractures (within 3 weeks), regardless of site. During the clinical examinations, diagnostic tests were done. Patients were urged to have wrist radiography check if any of these tests were positive. If radiography revealed no fracture, the wrist was immobilised with a below-elbow slab, and the patient was instructed to return in 15 days. After two weeks, the identical x-ray series was repeated. Regarding participation in the trial, all patients were thoroughly counselled and trained. The patient was enrolled in a prospective database if they agreed.

We advised stiff primary fixation for all acute scaphoid fractures with the patient's permission. Scaphoid casts were used on patients who declined surgery. For the first 12 weeks after surgery, patients were recommended to avoid full wrist loading and contact sports. All patients were requested to come in for routine check-ups at two and six weeks, three months, six months, and one year, with extra appointments scheduled as needed.

Each consultation included typical Scaphoid series radiographs as well as a thorough clinical examination. To assess each patient's functional outcome following treatment, the modified MAYO Wrist score was used.

RESULTS

A total of 60 cases of acute scaphoid fracture (<3 weeks) were seen during the research period. The mean age of patients was 36.5 years. There were n=48 (80%) male patients and n=12 (20%) female patients. The right side fracture was present in 38 (63%) patients and on the left side in 22 (36%) patients**.** (As shown in Table 1). All male-female patients were classified on the basis of

Herbert classification as shown in Table 2. Scaphoid fractures were frequently overlooked in patients. Following an acute wrist injury, a conventional AP and Lateral X-Ray were taken. The most prevalent type of injury was involved in a traffic accident, sports injuries, household injuries, and assault injuries were among the other causes of injuries.

A waist fracture (19 cases, 3 incomplete and 16 complete) was the most common kind of fracture, followed by a distal oblique fracture (19 cases, 3 incomplete and 16 complete) (7 cases). Twenty patients underwent surgery, while the remaining 40 were treated conservatively.

All of the patients that were followed up on received a Mayo wrist score. The average time of follow-up was 12 months. Out of 40 patients managed conservatively, 11 patients had poor results, 4 patients had medium results (65-79), 16 patients had good results (80-89), and 9 patients had outstanding results (>/=90). In operatively managed patients, poor results were reported in one patient, fair results in four, outstanding results in five, and wonderful results in ten. (As shown in Table 3) There were, however, twelve instances of conservative management refusing to unionise.

Table 1: Characteristics of study participants

Characteristics	No of Patients (n=60)	Percent %
Average age	36.5 years	
Age groups (years)		
20-30	22	36
30-40	18	30
40-50	11	18
50-60	9	15
Gender		
Male	48	80
Female	12	20
Fracture Site		
Right Side	38	63
Left Side	22	36

Table 2: Patient distribution according to Herbert classification

Herbert classification	Male=48	Female=12	Total
A1	9	0	9
A2	8	3	11
B1	6	5	11
B2	18	3	21
B3	4	1	5
B4	3	0	3

Table 3: Patients distribution for conservative and Operative methods

	Poor	Fair	Good	Excellent	Total
Conservative	11	4	16	9	40
Operative	1	4	5	10	20
Total	12	8	21	19	60

DISCUSSION

Wrist fractures, also known as scaphoid fractures, are common upper-limb injuries. Due to the complexity of fracture patterns, finding an effective strategy for fracture therapy is difficult. (9) Surgeons who specialise in orthopaedics face a challenging task in treating scaphoid non-union. (10) The purpose of this research was to assess the outcomes of conservative surgery in scaphoid fracture. However, when compared to surgery, conservative treatment had fewer problems. At six months, both therapies had significantly improved symptoms and function. (11)

Males had an 80% higher prevalence of scaphoid fractures than females (20%), according to our research. Khan, et al. observed that the occurrence of scaphoid fractures in males was 85 % higher than females in a study conducted in Pakistan (15 %). (12) Noaman, et al. observed that a total of 45 cases of ununited scaphoid fractures was studied. A total of 29 (64.44%) males and 16 (35.56%) females had ununited scaphoid fractures. (13) Zhao, et al. reported 132 patients with scaphoid fracture between January 2013 and December 2017, with 103 (78%) males and 29 (22.0%) females. (14)

Male patients aged between 30 to 40 years had the highest risk of scaphoid fracture, according to our data. This has previously been brought up. (15) Adolescents are more likely to fall because they are more likely to participate in sports like skateboarding, football, or fighting. Females are less likely to incur scaphoid fractures than men since they do not engage in the same amount of high-intensity exercise. (1, 16)

In our study, the right side had a larger prevalence of fracture location (63%) than the left side (36%). Khan et al., demonstrated that the right hand had the highest frequency of 72.50 % while bilateral hands had the lowest prevalence of 5% which were more similar to the results of our study (12) Comparable to us, Noaman et al. identified right hand in 32 (71.11 %) of scaphoid fracture patients and left hand in 13 (28.89 %) of scaphoid fracture patients in their paper published in 2011. (13)

A Mayo wrist score was given to all of the patients who were followed up on. The average time of follow-up was 12 months. A total of 11 patients out of 60 who were treated conservatively had negative outcomes. Poor outcomes were reported in one case and great outcomes in 10 others in operatively managed patients. Fusseti et al. observed in a Swiss study that 34% of people who were treated conservatively and had their wrist immobilised in a cast were able to return to work. (17) While minimally invasive operational therapy was initially more expensive than conservative treatment, according to Papaloizos et al., it led to a significant reduction in work compensation expenses and was ultimately less expensive than conventional treatment. (18)

Internal fixation promotes better functional outcomes and fractures union than conservative therapy, according to our data. At the time of the check-up, the surgically treated group had fewer patients with resting discomfort and pain during sports and physical activities, showing that operative treatment resulted in significant functional improvement.

CONCLUSION

As compared to conservative management, surgical technique had more favourable outcome. There were poor results in every fourth patient that was managed conservatively, while poor results were negligible in patients who were operatively managed.

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