Original Research Article

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Impact of traditional bone setter and informal treatment practices on outcomes of colles' fractures, a mixed methods study from Bangladesh

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Abstract

Introduction: Colles' fracture is one of the most common fractures of the upper limb, particularly among older adults, and appropriate early management is crucial for optimal functional recovery. This study aimed to evaluate the impact of traditional bone setters (TBS) and informal treatment practices on the clinical and functional outcomes of Colles' fractures, while also exploring the socio-cultural and economic factors influencing patients' initial treatment choices.

Methods: This mixed-methods study was conducted at 250 Beded General Hospital, Kurigram, Bangladesh, from July 2024 to June 2025, and included 50 consecutive patients diagnosed with Colles' fractures. Adult patients presenting with a history of distal radius fracture, with or without prior treatment from TBS or other informal practitioners, were enrolled. Data were entered and analyzed using the Statistical Package for the Social Sciences version 25.0.

Results: Initial care was sought from TBS or informal providers by 72.0%, while only 28.0% presented directly to formal healthcare facilities, resulting in delayed presentation beyond one week in 46.0% of cases. Common complications included malunion (34.0%), joint stiffness (28.0%), and chronic pain (22.0%), with only 20.0% having no complications. Functional outcomes were excellent or good in 54.0% and fair or poor in 46.0%. Low cost (66.7%), easy accessibility (58.3%), fear of surgery (50.0%), and cultural beliefs (44.4%) were the main reasons for choosing traditional or informal treatment.

Conclusion: This study highlights the continued widespread use of TBS and informal care for the management of Colles' fractures in Bangladesh, which is linked to delayed access to formal healthcare, increased complications, and poorer functional recovery. Factors such as financial limitations, ease of access, cultural trust, and apprehension toward surgical treatment played a major role in shaping patients' initial care-seeking decisions.

Keywords: Colles' fractures, informal treatment, traditional bone setter

Introduction

Colles' fracture is a common distal radius fracture characterized by dorsal angulation and displacement, typically resulting from a fall on an outstretched hand. It constitutes a significant proportion of upper limb fractures in adults and represents a frequent cause of functional limitation

if not managed appropriately.[1] Evidence-based management emphasizes early diagnosis, anatomical reduction, proper immobilization, and rehabilitation, while surgical fixation is indicated for unstable or severely displaced fractures.[2] In low- and middle-income countries such as Bangladesh, the management of musculoskeletal injuries is influenced by limited access to orthopedic services, financial constraints, and sociocultural beliefs. Consequently, many patients seek care from informal healthcare providers, particularly traditional bone setters (TBS). TBS are unlicensed practitioners who manage fractures using indigenous techniques such as manual manipulation, tight splinting, massage, and herbal applications, often without radiographic confirmation or knowledge of fracture biomechanics.[3] The continued reliance on TBS has been widely documented across South Asia and other developing regions. Cultural acceptability, affordability, proximity to rural communities, and fear of hospital-based surgical interventions contribute to their sustained patronage.[4] However, numerous studies have demonstrated that fracture treatment by TBS is frequently associated with adverse outcomes. These include malunion, non-union, chronic pain, joint stiffness, neurovascular compromise, compartment syndrome, infection, and, in severe cases, limb-threatening complications.[5] Hospital-based studies have reported that a substantial proportion of patients presenting with complicated fractures have a prior history of treatment by TBS. Such patients often present late, with established deformities and functional impairment, necessitating complex surgical correction and prolonged rehabilitation.[6] Beyond clinical consequences, the choice of traditional fracture care is shaped by multiple behavioral and social factors. Studies examining health-seeking behavior have identified a lack of awareness regarding fracture complications, perceived high costs of hospital treatment, long waiting times, and trust in traditional healers as key determinants influencing initial care decisions.[7] Bangladesh-specific studies have highlighted the burden of complications related to informal fracture management. Observational data from tertiary hospitals indicate that many patients presenting with delayed union, malunion, or chronic disability had initially received treatment from TBS, underscoring the public health implications of informal musculoskeletal care.[5] Despite the documented risks associated with traditional bone-setting practices, some authors argue that the complete exclusion of TBS from healthcare systems may be impractical due to their deep integration into community health structures. Instead, there is growing interest in understanding patient experiences and perceptions to inform culturally appropriate strategies aimed at improving referral pathways and early orthopedic intervention.[8]

Methods

This mixed-methods study was conducted at 250 Beded General Hospital, Kurigram, Bangladesh, from July 2024 to June 2025, and included 50 consecutive patients diagnosed with Colles' fractures. Adult patients presenting with a history of distal radius fracture, with or without prior treatment from TBS or other informal practitioners, were enrolled after obtaining informed written consent. Patients with open fractures, associated polytrauma, pathological fractures, or previous wrist deformities were excluded from the study. Quantitative data were collected using a structured questionnaire covering sociodemographic characteristics, initial treatment modality, delay in presentation, and clinical complications, along with radiological evaluation. Functional outcomes were assessed at final follow-up using the Gartland and Werley scoring system. Qualitative data were obtained through semi-structured interviews to explore patient-reported reasons for choosing traditional or informal treatment. Data were entered and analyzed using the Statistical Package for the Social Sciences version 25.0, with results expressed as frequencies and percentages. Ethical approval was obtained from the institutional ethical review committee before study initiation, and confidentiality of participant information was strictly maintained throughout the study.

Results

Most participants belonged to the 41–60 years age group (21 patients, 42.0%), followed by those older than 60 years (15 patients, 30.0%) and those aged 40 years or below (14 patients, 28.0%). Females constituted 32 cases (64.0%), while males accounted for 18 cases (36.0%). A majority of patients resided in rural areas (33 patients, 66.0%). Regarding education, 19 patients (38.0%) had no formal education, 23 (46.0%) had primary or secondary education, and only 8 (16.0%) had higher secondary education or above [Table 1].

Initial treatment was sought from TBS by 29 patients (58.0%), while 7 patients (14.0%) consulted other informal practitioners such as village healers. Only 14 patients (28.0%) presented directly to a qualified medical facility for initial fracture management [Table 2].

Presentation to formal healthcare occurred within 3 days in 12 patients (24.0%), between 4 and 7 days in 15 patients (30.0%), between 8 and 14 days in 13 patients (26.0%), and after more than 14 days in 10 patients (20.0%). Overall, 23 patients (46.0%) presented later than 1 week after injury [Table 3].

Malunion was the most common complication, observed in 17 patients (34.0%), followed by wrist joint stiffness in 14 patients (28.0%) and chronic pain in 11 patients (22.0%). Soft-tissue infection was present in 6 patients (12.0%), while neurovascular symptoms were noted in 4 patients (8.0%). Ten patients (20.0%) had no detectable complication at presentation [Table 4].

At final follow-up, excellent functional outcomes were observed in 11 patients (22.0%), while good outcomes were achieved in 16 patients (32.0%). Fair outcomes were documented in 15 patients (30.0%), and poor outcomes were seen in 8 patients (16.0%). Overall, 23 patients (46.0%) demonstrated fair to poor functional outcomes [Table 5].

Table 1: Sociodemographic characteristics of the study participants (*n*=50)

Variable	Frequency	Percentage
Age group (years)		
≤40	14	28.0
41–60	21	42.0
>60	15	30.0
Sex		
Male	18	36.0
Female	32	64.0
Residence		
Rural	33	66.0
Urban	17	34.0
Educational status		
No formal education	19	38.0
Primary/Secondary	23	46.0
Higher secondary and above	8	16.0

Table 2: Initial treatment modality sought by patients (*n*=50)

Initial treatment provider	Frequency (*n*)	Percentage
Traditional bone setter	29	58.0
Village healer/informal practitioner	7	14.0
Qualified medical facility	14	28.0

Table 3: Duration between injury and presentation to formal healthcare (*n*=50)

Time interval	Frequency	Percentage
≤3 days	12	24.0
4–7 days	15	30.0
8–14 days	13	26.0
>14 days	10	20.0

Among the 36 patients who initially sought traditional or informal care, low cost was cited by 24 patients (66.7%), easy accessibility by 21 patients (58.3%), fear of surgical intervention by 18 patients (50.0%), cultural belief or trust by 16 patients (44.4%), and lack of awareness regarding possible complications by 14 patients (38.9%) [Table 6].

Table 4: Complications observed at presentation to formal care (*n*=50)

Complication	Frequency	Percentage
Malunion	17	34.0
Joint stiffness	14	28.0
Chronic pain	11	22.0
Soft-tissue infection	6	12.0
Neurovascular symptoms	4	8.0
No complication	10	20.0

Table 5: Functional outcome at final follow-up using the Gartland and Werley score (*n*=50)

Functional outcome	Frequency	Percentage
Excellent	11	22.0
Good	16	32.0
Fair	15	30.0
Poor	8	16.0

Table 6: Patient-reported reasons for choosing traditional or informal treatment (*n*=36*)

Reason	Frequency	Percentage
Low cost	24	66.7
Easy accessibility	21	58.3
Fear of surgery	18	50.0
Cultural belief/trust	16	44.4
Lack of awareness of complications	14	38.9

*Multiple responses allowed

Discussion

In the present study, the majority of patients with Colles' fractures were middle-aged to elderly, with 42.0% belonging to the 41–60-year age group and 30.0% aged above 60 years. Females constituted 64.0% of cases, and 66.0% of participants were from rural areas. Court-Brown and Caesar reported that distal radius fractures are more common in females and older adults, largely due to post-menopausal bone loss and increased fall risk.[8] The higher female predominance in our study may also reflect lower health awareness and delayed access to orthopedic services among women in rural Bangladesh, compounding fracture severity and outcomes. In this study, 58.0% of patients initially sought treatment from TBS, while an additional 14.0% consulted other informal practitioners, leaving only 28.0% presenting directly to qualified medical facilities. Adje *et al*. found that 60–70% of musculoskeletal injury patients in low-resource settings initially consulted TBS due to accessibility and cultural acceptance.[7] Similarly, OlaOlorun and Oladiran reported that traditional practitioners remain the first point of contact for fracture care in rural populations, especially where formal services are limited.[4] The high reliance on traditional care in our cohort reinforces the persistent role of informal healthcare pathways in Bangladesh. Delayed presentation was a notable finding in the current study, with 46.0% of patients presenting to formal healthcare more than 1 week after injury. Ekere observed that patients treated by TBS often presented weeks to months after injury, leading to compromised fracture healing.[9] The shorter delay observed in our study compared to some African series may reflect increasing awareness and gradual access to tertiary care, though the delay remains clinically significant for Colles' fractures, where early reduction is critical. Regarding complications, malunion was observed in 34.0% of patients, joint stiffness in 28.0%, and chronic pain in 22.0%. Khan *et al*. reported malunion rates exceeding 50% among patients previously managed by TBS, with stiffness and chronic pain being frequent sequelae.[5] Panigrahi and Mishra documented malunion in 46% and soft-tissue complications in a substantial proportion of patients following traditional fracture care.[6] Although the complication rates in our study are somewhat lower, they remain considerable and likely reflect partial or delayed correction rather than optimal fracture management. Functional outcomes in this study were suboptimal, with only 22.0% achieving excellent outcomes, while 46.0% had fair to poor results. Bruyere *et al*. emphasized that improper initial management of distal radius fractures leads to long-term functional impairment, even when later treated appropriately.[10] The high proportion of fair and poor outcomes in our cohort suggests that delayed and inadequate early management has a lasting negative impact on wrist function.

The reasons for choosing traditional or informal treatment in this study were primarily low cost (66.7%), easy accessibility (58.3%), fear of surgery (50.0%), cultural belief (44.4%), and lack of awareness of complications (38.9%). Chowdhury *et al*. reported similar findings in Bangladesh, where financial constraints and fear of hospital-based surgical interventions strongly influenced initial treatment decisions.[11]

Limitations of the study

This study is limited by its small sample size and single-center design, which may restrict generalizability and introduce referral bias. Reliance on patient self-reporting may have resulted in recall and social desirability bias, particularly regarding prior treatment and reasons for choosing informal care.

Conclusion

This study demonstrates that TBS and informal treatment practices remain widely utilized for Colles' fractures in Bangladesh and are associated with delayed presentation, higher complication rates, and suboptimal functional outcomes. Socioeconomic constraints, accessibility, cultural beliefs, and fear of surgical intervention were key factors influencing initial treatment choices.

Recommendations

Early public awareness programs should be implemented to educate communities about proper fracture management and potential complications of delayed or informal treatment. Strengthening access to affordable orthopedic services, especially in rural areas, and establishing referral linkages between TBS and formal healthcare facilities may help reduce delays, minimize complications, and improve outcomes for patients with Colles' fractures in Bangladesh.

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