



Bonesetter interventions and consequences

Sinan ZEHİR¹, Regayip ZEHİR², Ercan ŞAHİN³, Turgut AKGÜL⁴, Sultan ZEHİR⁵, Mehmet SUBAŞI⁶

¹Hitit University Faculty of Medicine, Department of Orthopedics and Traumatology, Çorum, Turkey

²Çarşamba State Hospital, Department of Cardiology, Samsun, Turkey

³Bülent Ecevit University Faculty of Medicine, Department of Orthopedics and Traumatology, Zonguldak, Turkey

⁴Istanbul University Faculty of Medicine, Department of Orthopedics and Traumatology, İstanbul, Turkey

⁵Directorate of the Ministry of Health Community Health, Çorum, Turkey

⁶Gaziantep University Faculty of Medicine, Department of Orthopedics and Traumatology, Gaziantep, Turkey

Objective: Delaying the treatment of bone and tendon injuries may cause unmanageable complications. Bonesetters continue to cause delays in treatment. The purpose of this study was to analyze the medical outcomes of delay due to bonesetter intervention and factors affecting patient treatment preference.

Methods: Among outpatients treated at our clinic between January 2010–December 2012, bonesetter-intervened patients were included, and patient demographics, clinical outcomes, and possible social factors were retrospectively analyzed. Clinical examinations and radiological screening measurements were used to evaluate outcomes.

Results: Of the 162 patients, 97 (59.8%) were male, and mean age was 27.5±9.4 years. Eighty-nine (54.9%) of the patients lived in a rural area, and 108 (66.7%) underwent surgery. Bonesetter preference was dictated primarily by elderly relatives (47.6%) or neighbors (33.3%). Patients with a primary school education and unemployed patients mostly preferred bonesetters ($p=0.03$ and $p<0.01$, respectively), the explanation for which was the long treatment period and concern of being disabled ($p=0.04$). Complication rate among patients who were evaluated at a hospital was 33.9%.

Conclusion: Despite being medically unreliable and often times harmful, bonesetting is still accepted as an alternative treatment modality among uneducated patient and thus remains an ongoing problem in Turkey. Improvements in average education level and increased dissemination of accurate information via various media and non-governmental organizations will be effective in the correction and prevention of the afore-mentioned complications regarding bonesetter interventions.

Keywords: Bonesetter; complication.

Delayed or improper medical treatment by bonesetter can present serious problems, some of which are irreversible. In Turkey, consultation of bonesetters is 1 reason for the delay of treatment of bone and tendon.

Although some professional organizations are working to raise awareness in order to prevent complications of bonesetting practices, they have not yet been entirely successful. Unfortunately, in some societies, bonesetters

Correspondence: Sinan Zehir, MD. Hitit Üniversitesi Tıp Fakültesi, Ortopedi ve Travmatoloji Anabilim Dalı, Bahçelievler Mahallesi, Çamlık Caddesi, No: 2, 19030 Çorum, Turkey.

Tel: +90 364 – 222 11 00 e-mail: sinanzehir@yahoo.com

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are trusted and respected more so than orthopedists.^[1] The collective view of an international group of experts was issued in a World Health Organization (WHO) report on traditional treatment methods.^[2] Although there are no major problems after intervention for simple fractures, many complications have been reported as a result of bonesetter interventions.^[3-9]

In this study, we analyzed the consequences of bonesetter intervention.

Patients and methods

Patients who, following treatment by bonesetters, were seen by the orthopedics and trauma unit at our outpatient clinic between January 2010–December 2012 were considered in this study. Patients' social insurance number, level of education, reasons for seeing a bonesetter, and the distance between the patients' home and the health center were recorded. Physical examination findings and radiological imaging were used to evaluate complications and functional losses.

Mann-Whitney U test and chi-square tests were used. Statistical analyses were performed by using SPSS 15.0 for Windows software (SPSS Inc., Chicago, IL, USA). $P < 0.05$ was considered statistically significant.

Results

Of the 162 patients included in the study whose injuries were not suitable for treatment by a bonesetter due to their severity or non-healing fractures, 97 were male and 65 were female. Mean age of the patients was 27.5 years. Moreover, 73 patients were city dwellers while 89 were from rural areas. In total, 112 upper extremity and 50 lower extremity injuries were evaluated. The most frequently seen fractures were those of the distal radius (Table 1). Nine patients who initially sought clinical treatment later went to a bonesetter because they were unhappy with the discomfort created by the cast.

Surgery was performed on 108 patients, 37 of which were treated conservatively. Seventeen patients refused any treatment. Of those patients who had first consulted a bonesetter, 31 made the choice of their own accord, 72 did so upon advice from family elders, and 54 followed suggestions from neighbors. Eighty-three point three percent of patients lived <10 km from a health center, and 80.4% of patients' homes were <10 km away from a bonesetter. Table 2 shows patients' social insurance status and the distance between patients' home and the nearest health center. Evaluation based on the distance to a health center or to a bonesetter did not reveal any significance. Analysis based on level of education showed that

Table 1. Fractures presented by type.

Injury	n	%
Distal radius fracture	32	19.7
Supracondylar humerus fracture	21	12.9
Forearm fracture	10	6.2
Proximal humeral fracture	8	4.9
Finger fracture	8	4.9
Toe fracture	7	4.3
Tibial shaft fracture	7	4.3
Lateral malleolus fracture	6	3.7
Distal tibia fracture	5	3.1
Calcaneus fracture	5	3.1
Metacarpal fracture	5	3.1
Ulnar shaft fracture	5	3.1
Femoral neck fracture	4	2.4
Humeral shaft fracture	4	2.4
Radius shaft fracture	4	2.4
Tibial plateau fracture	4	2.4
Metatarsal fracture	4	2.4
Lateral condylar fracture of humerus	3	1.9
Medial malleolus fracture	3	1.9
Distal femur fracture	3	1.9
Proximal radius fracture	2	1.3
Clavicle fracture	2	1.3
Medial epicondyle fracture of humerus	2	1.3
Dislocation of shoulder	2	1.3
Scaphoid fracture	2	1.3
Femoral shaft fracture	1	0.6
Trochlea fracture of humerus	1	0.6
Dislocation of knee	1	0.6
Dislocation of elbow	1	0.6

patients with primary school education had significantly higher bonesetter consultation rates than other patients ($p < 0.03$). Patients with a poverty card also showed a significantly higher preference rate for bonesetters ($p < 0.01$).

Patients' reasons for utilizing bonesetters included long treatment periods in health clinics and fear of becoming physically disabled (Table 3) ($p = 0.04$). In total, 55 patients who attended the outpatient clinic presented with complications due to bonesetter intervention, and among these, the most frequently seen complication was decreased range of motion at the joints (Table 4). Amputation proximal to the knee was performed on 1 patient due to injury to the popliteal artery following delayed knee dislocation treatment, and a toe amputation was performed on 1 patient due to necrosis.

Discussion

Clinically, some complications may present following orthopedic surgery. In Turkey, sociocultural and socioeco-

Table 2. Distributions of patients' level of education, social insurance status, and distance from home to health center.

Parameters	n	%
Level of education		
No schooling/illiterate	43	26.5*
Primary school	57	35.2*
Secondary school	41	25.3
High school	17	10.5
University	4	2.5
Social insurance status		
Poverty card	76	46.9#
Social insurance institution	47	29.1
Independent foundations	19	11.7
Pension fund	17	10.5
Private insurance	3	1.8
Distance to a health center (km)		
0-5	71	43.8
6-10	64	39.5
11-15	18	11.1
>15	9	5.6
Distance to a bonesetter (km)		
0-5	51	31.7
6-10	79	48.6
11-15	11	6.8
>15	21	12.9

*p=0.03; #p<0.01.

nomic factors may result in delayed or incorrect treatment, which may be considered malpractice. Reversal of such complications is sometimes difficult and at times impossible. WHO has reported on traditional treatment methods and their potential to cause irreversible complications.^[2]

A large number of patients in Turkey prefer bonesetter treatment, and there are numerous reasons that they choose to utilize them. Following treatment by bonesetters, many complications may arise (Table 3, 4). Patients' predominant complaints, singly or together, include long treatment periods in clinics, fear of physical disability, discomfort in cast, unwillingness to have metal inside their body, and fear of surgery. Bonesetters lack medical training, instead practicing traditional methods passed down over generations.^[10-12] Herbal, zoic, or mineral remedies are often used as part of the treatment, and the bonesetters attribute their skills to social, cultural, metaphysical, and religious principles.^[1,11] For certain simple closed fractures, intervention by bonesetters might be adequate, but not in the case of articular or open fractures. Complications such as osteomyelitis, gangrene, malunion, joint stiffness, chronic articular dislocations, Volkmann's ischemia, sepsis, and tetanus may be seen.

Table 3. Reasons why patients choose bonesetters.

Reasons	n	%
Long treatment period in medical clinics	57	35.2*
Fear of physical disability	42	25.9*
Discomfort in cast	30	18.5
Unwillingness to have metal inside their body	24	14.8
Fear of surgery	9	5.6

*p=0.04.

Table 4. Complications.

Complications	n	%
Impairment range of motion of joints	24	14.8
Degenerative arthritis	10	6.2
Permanent nerve injury	5	3.1
Skin necrosis	5	3.1
Deformity	4	2.5
Compartment syndrome	3	1.8
Amputation	2	1.2
Nonunion	1	0.6
Shortness	1	0.6
Total	55	33.9

^[12-15] In more than half of treatments by bonesetters, proper alignment is not achieved, and some impairment occurs.^[16]

In most fractures, because the injured area can be clearly seen, people may assume it can be reduced and treated simply by covering with a bandage. Bonesetters can achieve successful treatment in some simple fractures and consequently develop a reputation for their accomplishments. Belief that bonesetters possess some metaphysical or religious power may lead some to prefer treatment by bonesetters rather than orthopedists. Since most bonesetters do not use any radiologic imaging methods, such treatment may result in serious complications. Unfortunately, 33.9% of such complications among hospitalized patients presented in this study could not be reversed, in spite of modern techniques.

There are numerous reasons why people choose alternative treatment methods. One study showed that approximately half of people who live in urban areas and nearly all of the people who live in rural areas knew of these alternative methods, and that 25% of those who live in cities and 75% of those who live in rural areas elect to use these alternative treatments. The most frequently used alternative treatment is bonesetting.^[17,18] In another urban-focused study, 94.2% of participants said they were aware of alternative treatment methods, and 59.9% were aware of bonesetters.^[11] They reported that

the main reasons for choosing bonesetters were low cost, easy access, and short recovery time.^[4,11,12,19–21]

In our study, 98.2% of the patients had social insurance. Interestingly, those who were productive and could secure an income or those who were socioeconomically functional often chose bonesetters. In our patient group, 73.5% had some level of education.

This situation may also be related to the level of education in Turkey. The government issues “poverty cards” to people who are unemployed and who have no land or property to provide them with social security. It may be that these people are more prone to sociocultural influence. Moreover, it is possible that these patients often choose alternative treatment modalities because they have easier access to bonesetters, but in our study, data show that neither distance from patients’ home nor cost are significant factors. In many cases in Turkey, it is difficult to be treated by an orthopedic surgeon without an appointment. Thus, we have concluded that customs of habit and social environment are influential in the decision to choose bonesetters.

During callus formation, alignment of the fracture is very important, and with modern imaging techniques, correct alignment of the fractured bones can be achieved. Naturally, healing will take a longer when the fracture is complicated. In our study, 1/3 of our patients reported that they resorted to a bonesetter due to long treatment periods at health centers. This misconception may be due to physicians not adequately informing patients. To address this issue, clinics should inform patients regarding the difference between simple fracture healing practiced by bonesetters and the duration of healing for more complicated fractures. Additionally, 5.5% of patients in our study who first consulted a physician at a health center later chose to see a bonesetter, citing their fear of becoming permanently disabled or of having a metal implant placed inside their body, leading us to conclude that patients are not adequately informed about procedures and are not properly approached in clinics. Informing patients in health centers prior to treatment can decrease consultation with bonesetters.

Taking into consideration that 80.9% of the patients had gone to bonesetters following neighbors’ or relatives’ advice, we may deduce that pressures from the social environment and strong family ties are significant factors affecting misconceptions and habits regarding this issue.

To prevent such complications caused by traditional bonesetting practices, we must decrease patient demand for these untrained practitioners. The problem is not related to access to health centers but with lack of edu-

cation and certain cultural habits. In order to overcome misconceptions and fears, health providers as well as the public must be educated, approaches in accordance with cultural values and beliefs must be adopted, and efforts must be made to improve the credibility of modern treatment methods.

Conflicts of Interest: No conflicts declared.

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