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TREATMENT OF FRACTURES AND ITS COMPLICATIONS BY TRADITIONAL BONE SETTERS: IN A TERTIARY CARE HOSPITAL.

Orthopaedics

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ABSTRACT

Background: Fracture of bone is a persistent problem encountered in orthopedic practice globally and its management depends on reduction and immobility at the fracture site. Traditional bone setters are accepting this procedure as a familiar custom to formulate their own methods and practices for the management of fractures.

Aim of the Study: The aim of the study is to evaluate and manage the complications occurred during the treatment given by TBS.

Methods: One hundred and twenty cases coming to OPD during the period of Aug.2014 to Nov.2016 with some kind of prior treatment received from TBS are included in the study. Each case was subjected to detailed clinical and radiological examinations to evaluate the outcomes of the interventions by TBSs.

Results: Malunion is the predominant form of presentation with 54 cases (46%) followed by non union in 24 (20%) cases. 33 cases (28%) presented with impending ischemia at initial stages of treatment. 8 cases (6%) presented with chronic osteomylitis and infected nonunion. Eventually 13 cases ended with gangrene and amputation. Cost of surgery emerged as the major cause (42%) followed by fear of surgery (23%) to receive treatment from TBS.

Conclusion: The results in our study vindicate the fact that TBS play a major role in providing health care to the fracture patients. Multiple factors contribute to the wide spread acceptance of TBS in society. Lack of knowledge about the basic anatomy and referral system by TBS is responsible for complications. So it is required to create public awareness and integrating TBS in the healthcare system through proper training and due legislation is the possible aim to be achieved.

KEYWORDS

Basic anatomy, chronic osteomylitis, Malunion, nonunion and Traditional Bone Setters.

Introduction:

In the process of evolution man has put a continuous effort in developing methods & practices for improvement of his own health. With passage of time many of such arts have become prey to modern medical sciences. But that one refuses to die is the art of traditional bone setters (TBS). In spite of criticism and adversities this age old art has managed not only to survive but also to flourish in every sector of society.

Since 400 B.C till date many prophets like Hippocrates, Susruta, Hugh Owen Thomas etc have tried to justify the usefulness and reasonability of this art. It was Susruta in 3000 years ago in his famous classic Susrutasanhita detailed the "Khandabhagna" (fracture in general), its type, clinical diagnosis, various techniques and principles of treatment.("Science & Society in anciant India" by D B .Chottopadhya 1977 [1]. Studies accept that many fractures do heal with the traditional method of treatment. (Eshete M. JBJS 2005) [2] . The traditional bone setting plays a vital role in meeting the needs of orthopedic problems especially in rural areas where the formal primary & secondary health care is not adequate. It has been reported that about 70000 traditional bonesetters are prevalent in India and treat about 60% of total trauma patients Eshete .M et.al. JBJS: 2005[2]. Approximately 30-40 patients are attended by single bonesetter per day. In the country like India about 350 traditional bone setters are documented in 16 districts in Tamilnadu, Pondicherry and 4 districts in Kerala. Many of the journals revealed the prevalence of traditional bone setters in African countries are to be very high" [3]. Various psychosocial and economic factors embolden these bone setters in society particularly in the developing countries. However their credibility is challenged from time to time by various studies. Can the art of TBS be relied up on or to be reviewed particularly when the modern orthopedic science with its well developed armamentarium is at the door step? This is a growing debate across the globe rather. With this background, we have done an observational prospective study to evaluate the methodology and various outcomes of treatment by traditional bone setters and to find out the facts enacting behind their survival.

Materials and Methods:

Present study included 120 cases presented to the Outpatient department of Orthopedics, SCB Medical College, Cuttack at different stages of treatment by Traditional Bone Setters during period of Aug 2014 to Nov. 2016. Informed consent was obtained from all the cases. subsequently, each case was subjected to detailed clinical & radiological examinations to evaluate the outcomes of the interventions of TBSs. Special emphasis was given on the fracture union, functional recovery in terms of weight bearing, range of moment at joints, infection, deformity or any other relevant results.

The method of interventions provided in hospital were
Conservative Close Manipulation:

- (Osteoclasis) POP Cast under anesthesia
- PTB Cast
- Functional bracing

Operative:

- External fixation for neglected open wounds
- CRIF under anesthesia
- ORIF under anesthesia with or without bone grafting
- Ilizarov ring fixator for infective non union
- Amputation and Rehabilitation for gangrenous limb.

Inclusion Criteria: Fracture cases managed by Traditional Bone Setters.

Exclusion criteria: Fracture patients directly reporting to our institution.

Ethical issues

This study confirms to the ethical principles of medical research developed by the World Medical Association Declaration of Helsinki. Ethical clearance was given by the Institunal Ethics Committee S.C.B Medical College Cuttack, 753007[Orissa]

Data Analysis

All data obtained with questionnaire and biochemical analysis were analyzed using the Graph Pad program for Windows (Graph Pad Software). Statistical significance was accepted when P value is ≤ 0.05

Results

Table no 1. Type of Injury in the study population

Type of injury		No. of cases	percentage (%)
Fractures	Simple	83	69%
	Compound	12	10%
Soft tissue injury and dislocation		25	21%
Total		120	100%

Most of the cases the TBS manage are simple fractures 83 (69 %) and soft tissue injuries like sprain strain etc. 25 (21 %). Only 12 (10 %) cases were of compound fractures. It tells that TBS clinically avoid dealing compound injuries on the people have minimum awareness of infection & prognosis and hence avail hospital services. **Table no 1.**

Table no 2. Type of Fracture in the study population

Type of fractures		No . of cases	percentage (%)
Upper Limb	Long bones	24	25%
	Small bones	2	2%
	Intra Articular	14	15%
Lower Limb	Long bones	35	38%
	Small bones	5	5%
	Intra Articular	10	10%
Axial (Vertebrae, Pelvis etc.)		5	5%
Total		95	100%

Out of all fracture cases lower limb was involved in 53% of cases and upper limb in 42% of cases. In both situations long bone fractures were predominant. Out of all long bones fracture cases with femur was maximum followed by tibia fracture followed by forearm bone fractures. Among children supracondylar fracture of humorous cases were of the significant no. (14 %). Axial Skeleton injury cases like Spine, Pelvis, Rib fractures etc constitute very less in number (5%). **Table no 2**

Table no 3. Duration of Treatment by TBS in the study population

Duration of treatment	No. of cases	Percentage (%)
< 6 Week	73	61%
> 6 week	47	39%
Total	120	100%

The traditional bone setters treated these patients for varying period of time ranging from 3 days to 12 months, but the average duration of treatment (102 patients who remember) by the TBS in this study was 10.7 weeks. When evaluated further (73) 61% patients underwent treatment for <6 weeks while 47 (39%) underwent treatment for > 6 weeks. There was no association between the duration of therapy by the TBS and malunion. **Table no 3.**

Table no 4. Type of presentations in the study population

Complication	No. of cases	Percentage (%)
Malunion	54	45.2%
Non union	24	20%
Chronic Osteomylities	8	6%
Impending ischemia	33	28%
Others (Tetanus, Sepsis etc.)	1	0.8%
Total	120	100%

54 cases (45.2%) had malunion & 24 cases (20%) had non union. The second major group comprised of cases with impending ischemia. These cases were having swollen limbs, discolored skin, doubtful vascularity. Out of 33(28%) cases with features of impending ischemia,6(18%) cases lost their limb by amputation as a lifesaving procedure. Rest 27(82%) cases though salvaged their limbs presented varied spectrum of functional out come. This spectrum included cases with good range of joint moment to flexion contracture, stiffness of joints and muscle contracture etc. **Table no 4.**

Table no 5. Treatment complication malunion in the study population

Observation		Number of cases	Percentage
Total cases of malunion		54	
accepted deformity		41	22%
Agreed for intervention	Osteoclasis& POPcast	03	6%
	Corrective osteotomy	10	18%
Satisfactory result (Good Joint Rom, Deformity Correction etc)		08	15%
Unsatisfactory result (Persistent Deformity, Joint Stiffness etc.)		05	9%

Out of 54(46%) malunion cases 41 cases (36%) accepted the deformity and denied any surgical intervention. Rest 13 cases (11%) gave their consent for corrective procedure. 3(2%) cases were managed by Osteoclasis and POP casts. Rest 10 cases (8%) were managed by corrective osteotomy. At 6 months follow up, 8 cases (6%) had satisfied functional outcome in terms of deformity correction & joint range moment. In rest 5 cases (4%) joint stiffness, shortening & residual deformity were the feature. **Table no 5.**

Table no 6. Treatment complication nonunion in the study population

Observation		No. of cases	Percentage
Total cases of nonunion		24	
Types of nonunion	Hypertrophic	13	54%
	Atrophic	11	46%
Site of Nonunion	Tibia	12	50%
	Humerus	08	33%
	Femur	04	17%
Denied for intervention		08	33%
Agreed for intervention (Orif &Bone Grafting)		16	67%
Satisfactory result (Union Achieved)		12	50%
Unsatisfactory result (Persistent Nonunion)		O4	17%

Out of 24 cases (20%) of nonunion, 11 cases (46%) were having atrophic nonunion & 13 cases (54%) were of hypertrophy nonunion because of inadequate & improper immobilization. 12 cases (50%) were of tibial nonunion, 8 cases (33%) of humorous nonunion and only 4 cases (17%) were of nonunion of femur. 8 cases (33%) restrained themselves from any kind of surgery. 16 cases (67%) were offered open reduction and internal fixation with bone grafting. The cases were followed up at 3 month intervals. In 4 cases (17%) union could not be achieved at the end of 9 months. In rest 12 cases (50%) union could be achieved but surprisingly the rate of union was slow and the duration of callus formation and radiological union was prolonged with an average of 9 months in lower limbs and 6 months in upper limbs. **Table no 6.**

Table no 7. Treatment complication impending ischemia in the study population

Obserbation		No. of cases	Percentage
Cases with features of impending ischemia		33	
Site of ischemia	Upper limb	20	61%
	Lower limb	13	31%
Cases agreed for intervention		33	100%
Cases with gangrene & subsequent amputation		06	18%
Cases with salvaged limb & ischemic contractures		27	82%

33 cases (28%) presented with features of impending ischemia. Out of them 20 cases (61%) were of upper limbs & 13 cases (39%) were of lower limbs. All the cases with impending ischemia accepted the conservative management which included elevation, anti inflammatory medications, dressing and judicious fasciotomy in selected cases. This was a matter of regret that 6 cases (18%) were lost their limbs by amputation as a life saving measure. All the amputees were provided with physiotherapy and rehabilitation services. In rest 27 cases (82%) though the limbs were salvaged, the ultimate functional out comes were very poor. **Table no 7**

Table no 8. Treatment complication chronic osteomyelitis in the study population

Observation	No. of cases	Percentage
Cases of chronic OM	08	
Cases agreed for intervention (Saucerisation, Curretage, Antibiotics, Elizarov Ext.Fixator etc)	08	100%
Satisfactory result **(Infection Controlled)**	04	50%
Unsatisfactory result **(Infection Persisted)**	04	50%

In spite of all possible modalities of treatment the outcome of management in chronic osteomyelitis cases are not impressive. Seven out of eight chronic osteomyelitis cases were provided saucerisation, curettage, prolonged antibiotics after culture sensitivity test. One case of infected non union was subjected to debridement and ilizarov external ring fixator. The infection could be controlled only in 4 cases (50%). **Table no 8.**

Table no 9. Reasons for Inclination towards TBS in the study population

Reason	No. of cases	Percentage
Cost factor	41	33%
Lack of awareness	14	11%
Fear of Surgery	28	23%
Local belief & traditions	8	7%
Easy accessibility	19	15%
Hear Say	10	12%
TOTAL	120	100%

With an intention to find out the various reasons that increase the acceptance of traditional bone setting among common mass, all the patients were questioned about what fascinated them about traditional bonesetters. The following interesting responses were obtained.

Cost factor was the major factor for people's apathy (33 %) towards modern orthopedic services. On an average, a patient having limb fracture spends only hundreds of rupees at TBS, whereas the cost at hospitals necessarily exceeds much even in conservative methods.

About 18 % of cases are still ignorant about the advancement of modern orthopedic surgery, the various complications of traditional bone setting etc. It is a common misconception among people that hospitalization for fracture means surgical treatment.

This phobia for surgery abstains many people from availing orthopedic services. In our study, this group constituted 23 % of total cases.

Nineteen 19(15%) out of 120 patients attributed this easy accessibility as the cause for their inclination towards TBS.

At the end 10 (12%) of patients answered in a very casual manner. Either they said their inability to answer or simply said that they get biased by fellow villagers, friend's opinions about TBS. Table no 9.

Discussion:

In this study the bulk of the patients were young people below 45 years (40%) with children <15 years contributing a significant proportion (35%). Any kind of functional impairment in this group directly affects the productive and valuable group in a society. Distribution of sex in the present series showed a male preponderance with M: F ratio about 2: 1 [4]. The involvement of more young males is not surprising as they are more adventurous in the active years of life and engage themselves in injury prone activities in the day to day life. Quite a good number of people in this study were having an affordable life style. Fifty one cases (42%) were above poverty line. (The standard taken for socioeconomic status in this study is possession of BPL card). 20% of the APL (Above poverty line) cases were having even good repute and business in their villages. Also, 56 literate cases (47%) had attended the TBS instead of availing the modern health avenues. These results are definitely a set back to the aim of the WHO i.e. health for all". In spite of awareness, education, affordable financial status, still people are inclined towards these TBSs. So, other causes such as psychosocial factors need to be evaluated. This study also rejects the misconception that poverty and illiteracy are the important causes that patronise the traditional bone setters in the common mass [5]. In this study, as compared to simple fracture and soft tissue injuries, the number of cases with compound fractures is substantially low i.e. 10%. This suggests that either the TBS tactically avoid dealing compound injuries or the people in apprehension of bleeding and infection seek the hospital services. Whatever may be the reason, but this trend is definitely a blessing in disguise. Otherwise the mortality & morbidity would have been very high in terms of limb amputation, septicemia etc [6]. In their study on complication of TBS in Nigeria found bones of axial skeleton were fractured more frequently than other and the most frequently fractured bone was femur followed by Tibia, humerus and fibula in order of incidence. Most of the TBS use of bamboo stick or barks of trees as splints, and wrap them around the injured part with help of cloth. Ninety percent (90%) TBS use some form of paste made up of herbal roots and leafs prior to the splintage and apply hot compression frequently [7, 8, 9]. This study also revealed the extent of splintage in 94% of the fractures confined to the injured site of the limb letting the adjacent joints be free to move. The traditional bonesetters are giving various logical answers to justify their approach. According to them, liberation of joints prevents stiffness and favours early return of functional status of the limb. Movement of the fractured limb enhances the rate of union and callus formation. This concept justifies to some extent the modern Sarminto's concept of functional cast bracing, Khan A A (Journal of Bangladesh Ortho Society Jan 1981 [10]. The most common complication observed in this series is malunion in 54 cases (46%) followed by impending ischemia (28%) contrary to observations made by Omololu, Bet.al [11], where nonunion is the most common complication (36.6%). The observations by Chowdury M [12] support results of this series where malunion is the predominant type of presentations. Non union (25%) has been observed as the second most common complication of traditional bone setting in their series. TBS hardly respect the soft tissue overlying the fractured bones. The lepa, heat applied irritate & scarify the skin badly. Enthusiastic application of tight splintage with intent to achieve rigid immobilization impairs vascularity. Early movements, inadequate extention of splints make the fractures unstable and impart repeated stress on the uniting bone. This delays the progress of union (which is observed in this series to be on average 9 months in lower limbs & 6 months in upper limbs) and also leads to union in various deformed positions Nwadiaro H et.al. [13,14]. In the present study significantly 23% cases have apprehensions for surgery at hospitals. Ironically people harbour a false assumption that a visit to a hospital automatically means surgical treatment. The complications following surgery is pointed out every where even if the percentage is negligible. This very phobic psychology encourages many limb injury cases to approach TBS for non surgical managements [15,16]. It is apparent in this study that along with financial constraints, psychosocial beliefs, local traditions and cultures even do influence the common mass to a large extent for availing traditional methods of fracture treatment [17]. Among various reasons cited by patients, Cost factor was the major reason (33%) followed by fear for surgery (23%). But at the same time, in the face of poverty, lack of infrastructure, illiteracy, this age old art becomes an easily accessible and affordable alternative for the common people at the door step as far as musculoskeletal injuries are concerned. In countries like India, traditional bone setters are the largest specialist group practicing traditional medicine [18] Due to scanty knowledge and prejudices ideas, TBS are unaware of wound toileting, use of anti tetanus and antibiotics.

Conclusion:

Educational and social awareness are the key tools to impregnate the mind of common people with disastrous outcome of traditional bone setting. This indigenous art should be honoured and the TBS may be educated and encouraged to follow the basic principles of fracture managements. Traditional bone setting may be integrated into primary health care system. The medical regulatory bodies should design programs that can give basic training to TBS for safe application of splints and early identification of signs of ischemia so to say at the door step of injured. They may be urged to adopt the referral services in cases of complications. They should be permitted and encouraged to attend as orthopedic assistants in primary trauma departments as a part of rural health scheme. Taking the noble approach of converting traditional birth attendants (TBA) to trained birth attendants (TBA) as reference, efforts may be made to convert these traditional bone setters to trained bone setters which seems to be a feasible option. Finally, progressive improvement in the economy and general public awareness is rather mandatory to complement these actions to reduce the number of traditional bone setters and increase utilization of modern orthopedic services is the ultimate aim to be achieved.

Conflict of interest: None to declare.

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