



Complications of Treatment of Musculoskeletal Injuries by Bone Setters

Les complications du traitement des blessures musculo-squelettiques par Bone Setters

A. Dada*, S. O. Giwa†, W. Yinusa‡, M. Ugbeye‡, S. Gbadegesin‡

ABSTRACT

BACKGROUND: Traditional bone setters (TBS) have existed for decades in Nigeria and other countries. Their treatment methods often lead to several complications, the most dangerous being extremity gangrene which usually leads to proximal amputation.

OBJECTIVE: To apprise the Orthodox Practitioners of complications of musculoskeletal injuries treated by the bone setters, the factors that encourage patronage of TBS services and the outcome of the treatment of these complications by the orthodox practitioners.

METHODS: This was a one-year prospective study involving one hundred and twenty-one consecutive patients presenting with complications related to treatment of their musculoskeletal injuries by bone setters. The following data were obtained using observer-administered questionnaires viz; demography, details of initial injury, reasons for patronage of TBS, nature of treatment, estimated cost of treatment and disability of patients at presentation. The outcome of orthodox treatment of these complications was assessed at six months using the following parameters – wound healing, bone union and use of prosthesis by the patients.

RESULTS: One hundred and twenty-one patients with 155 musculoskeletal injuries and 168 complications of treatment by the TBS were seen; 75 (57%) were male and 52(43%) were female. The ages of the patients ranged from 6 weeks – 72 years (mean 29.49 years). The common complications of TBS treatment were malunion and non-union which each accounted for 27 (16.1%) cases. The major reasons for TBS patronage was the perceived low cost of treatment in 47(27.9%) and pressure from family and friends in 36 (25%) patients. The cost of treatment of the TBS ranged from USD 18-380, whereas, at the Orthopaedic Hospital, it ranged from USD 34-98. At six months after orthodox surgery, 10(91%) of the patients who had amputation were yet to start using prosthesis, 3(23%) who had internal fixation failed to unite.

CONCLUSION: The commonest reason for patronage was the believed cheapness of the TBS services. However, this study showed that orthodox treatment is actually cheaper in most cases. Despite all the complications associated with their treatment, majority of the people still have a strong belief in their capability. A suggested solution will be the incorporation of the TBS into the healthcare system so that they could be better trained and controlled. *WAJM 2009; 28(1): 333–337.*

Key words: Traditional Bone Setter, Fractures, Complications.

RÉSUMÉ

CONTEXTE: Les os setters (TBS) existent depuis des décennies au Nigeria et dans d'autres pays. Leurs méthodes de traitement conduisent souvent à plusieurs complications, le plus dangereux étant extrémité gangrène qui conduit généralement à l'amputation proximale.

OBJECTIF: Afin de sensibiliser les praticiens de l'Eglise orthodoxe de complications des blessures musculo-squelettiques traités par l'os setters, les facteurs qui encouragent les services de patronage de TBS et des résultats du traitement de ces complications par les orthodoxes pratiquants.

MÉTHODES: Il s'agissait d'une année une étude prospective impliquant cent vingt et un patients consécutifs présentant des complications liées au traitement des blessures musculo-squelettiques en os setters. Les données suivantes ont été obtenues à l'aide de questionnaires administrés observateur à savoir; la démographie, les détails du dommage initial, les motifs de parrainage de TBS, la nature du traitement, le coût estimé du traitement et de l'invalidité des patients à la présentation. Les résultats des orthodoxes au traitement de ces complications a été évaluée à six mois en utilisant les paramètres suivants: - la cicatrisation de la plaie, l'union des os et de l'utilisation de la prothèse par les patients.

RÉSULTATS: Cent vingt et un patients avec 155 blessures musculo-squelettiques et 168 complications du traitement par le SCT ont été observés, 75 (57%) étaient de sexe masculin et 52 (43%) étaient des femmes. L'âge des patients variait de 6 semaines - 72 ans (moyenne 29,49 ans). Les complications du traitement ont été malunion SCT et non syndiqués, qui représentaient respectivement 27 (16,1%) des cas. Les principales raisons pour lesquelles le SCT est la perception de favoritisme à faible coût de traitement dans 47 (27,9%) et la pression de la famille et des amis de 36 (25%) patients. Le coût du traitement de la TBS varie de 18-380 USD, alors que, à l'Hôpital orthopédique, il variait de 34-98 USD. À six mois après la chirurgie orthodoxes, 10 (91%) des patients qui n'ont pas encore eu l'amputation pour commencer à utiliser la prothèse, 3 (23%), qui avait manqué de fixation interne à s'unir.

CONCLUSION: La commune de raison pour le parrainage a été cru bon marché de la SCT services. Toutefois, cette étude a montré que le traitement est réellement orthodoxe moins cher dans la plupart des cas. Malgré toutes les complications associées à leur traitement, la majorité des gens ont encore une forte croyance en leur capacité. Une solution proposée est l'intégration du SCT dans le système de soins de santé afin qu'ils puissent être mieux formés et contrôlés. *WAJM 2009; 28(1): 333–337.*

Key words: Les os setters, Fractures, Complications.

*Department of Orthopaedics/Trauma, Federal Medical Centre Ebute-Metta, Lagos. †Department of Surgery, Lagos University Teaching Hospital, Lagos. ‡Department of Surgery, National Orthopaedic Hospital, Igbobi, Lagos

Correspondence: Dr. Adedamola Dada, Department of Orthopaedics and Trauma, Federal Medical Centre, Railway Compound, Ebute-Metta, Lagos. E-mail: dadajuwon@yahoo.com

INTRODUCTION

Traditional Bone Setters (TBS) are a part of healthcare delivery in many developing countries of the world. Their acceptance cuts across social strata, educational qualification and religious belief.¹ Indeed, some people believe that they treat fractures better and they are indispensable.² This is not far fetched from the African belief that sickness and afflictions quite often have spiritual components,² which cannot be treated by orthodox means and the TBS treatment is also believed to be cheaper.^{3,4,5} However, the treatment methods adopted by the TBS are not scientifically based and cause a lot of complications, which if not fatal, may lead to loss of limb.^{6,7,8} These complications bother the orthopaedic surgeons since they not only form a large number of the cases seen by them but also create a lot of problems in terms of management.^{3,4}

Majority of these complications are caused by the methods used in managing these fractures such methods include the use of rattan cane, and palm stick wrapped round fracture segments with consequent tourniquet effect. Others include massaging and excessive traction with the attendant possibility of heterotopic calcification, mal-union and non-union. There is also the use of incantations and scarifications, which can cause infection and osteomyelitis.^{3,4} Of recent however, some TBS have included some orthodox practices like intra-muscular injections and suturing into their practice. The consequences of this are complications like tetanus and sepsis.

The objective of this report therefore was to apprise the orthodox practitioners of the problems created in the health system by the bone-setters, the reasons for their patronage and the outcome of the treatment of these complications in the hospital.

SUBJECTS AND METHODS

This was a prospective study of all patients with musculoskeletal injury treated strictly by the TBS, before presenting to the Accident and Emergency Unit or the Out-Patient Department of the National Orthopaedic Hospital, Igbobi, Lagos with complications related to the treatment of the fractures by TBS. All

patients who met the inclusion criteria within the period June 2004 to May 2005 formed the population size. Information was obtained from the patient using observer-administered questionnaires.

Cause-effect relationship was established by getting from the patients, a description of the original injury, the methods and materials used in the treatment at the TBS and performing a clinical assessment to establish existence of a complication of treatment. Each patient had postero-anterior and lateral X-ray views as a minimum. Patients in which complication could not be established clinically and radiologically were excluded from the study.

The following data were collected using a proforma viz; demography, details of initial injury, reasons for patronage of TBS, nature of the treatment at TBS, estimated cost of treatment, disability of patient at presentation, patient's comments and feelings about previous treatment(s) at the TBS, reason for abandoning the TBS and patient's expectations of orthodox treatment.

Clinical and radiological assessments were done at admission and at six months to determine the success or otherwise of the offered treatments using the following parameters to measure the outcome of treatment depending on the type of injury – wound healing, bone union and successful use of prosthesis.

RESULTS

A total of 121 patients were studied. There were 155 musculoskeletal injuries with 168 complications. Sixty-nine (57%) were male while 52 (43%) were female (M : F = 1.3:1). The ages of the patients ranged from six weeks – 72 years (Mean 29.49 years) with majority of the patients falling into the first, third and fourth decades of life (Table 1).

Table 1: Distribution of Patients by Age

Age	Number (%)
0 – 10 yrs	26(21.5)
11 – 20 yrs	11(9.1)
21 – 30 yrs	23(19)
31 – 40 yrs	35(28.9)
41 – 50yrs	14(11.6)
51 – 60 yrs	7(5.8)
61 – 70 yrs	3(2.5)
71 – 80 yrs	2(1.7)
Total	121(100)

Ninety-eight (81%) of the patients were in the informal sector of the economy and 79 (65%) of the studied population had secondary education and above.

The mechanisms of injury were mainly due to road traffic accident in 57(47%) patients and falls in 43(36%) patients. There were 93 (76.9%) with closed fracture, 17(14%) with open fractures and 11(9.1%) with soft tissue injuries only.

The complications of the TBS treatment are shown on Table 2, non-union and malunion being the most common with 27 (16.1%) cases. However, extremity gangrene with 11(6.6%) was also noted. The treatment of purely soft tissue injuries by the TBS accounted for 4(36%) of the extremity gangrenes.

Table 2: Type and frequency of complications due to treatment by traditional bone setters

Complication	Number (%)
Avascular Necrosis	9(5.4)
Bony Ankylosis	2(1.2)
Chronic Osteomyelitis	6(3.6)
Compartment Syndrome	1(0.6)
Delayed Union	6(3.6)
Gangrene	1(16.6)
Heterotypic Calcification	5(3.0)
Joint Instability	3(1.8)
Malunion	27(16.1)
Non-Union	27(16.1)
Osteoarthritis	11(6.6)
Shortening	17(10.1)
Soft Tissue Injury	16(9.5)
Stiffness	18(10.8)
Volkmann Contracture	1(0.6)
Wound Infection	8(4.8)
Total	168(100)

A total of 124 bony injuries, 20 joint injuries and 11 soft tissue injuries were seen from the 121 patients in the study as shown in Figure 1.

Thirty-six (29%) of the injuries, were humeral fractures with supracondylar injuries in children accounting for 17(47.2%) of the humeral injuries. Others included 21 (16.9%) fractures each of femur and tibia.

The TBS treated the patients with a variety of methods often using a combination of methods. The most common methods were herbal massage in 60(49.6%) patients, splintage in

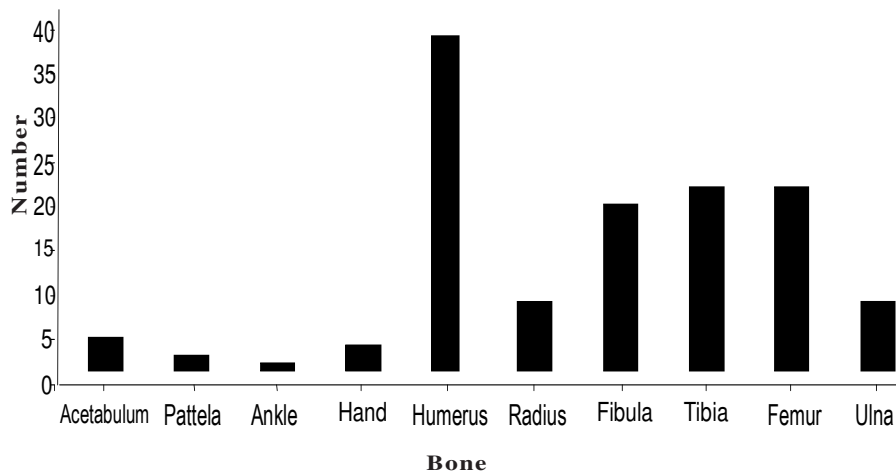


Figure 1: Frequency and type of bones involved.

Table 3: Methods of Treatment of Complications

Complication	Treatment	No. of Patients	Failure rate Number (%)	Index of Success
Extremity gangrene	Amputation	11	10 (91%)	Use of Prosthesis
Infected non union	External Fixation	1	–	Union
Non-Union/Mal Union	ORIF	13	3 (23%)	Union
Joint Stiffness	Physiotherapy	15	4 (27%)	Functional Range
Delayed Union	POP	5	–	Union
Infected wound	Wound Care	7	–	Wound Healing

ORIF, Open Reduction and Internal Fixation; POP, Plaster of Paris

43(35.5%) patients and manipulations in 10(8.1%) patients. Some of the TBS sutured and administered intramuscular injections.

The reasons for patronizing the TBS by the patients were mainly because of the perceived cheapness, 40(27.9%) patients, pressure from family and friends, 36(25%) patients, faster healing with TBS treatment, 33 (22.9%), delays in health facilities in 19(13.2%) cases, on-going health workers strike at time of injury in 11(7.6%) cases and the fear of amputation in 5(3.5%) cases.

After a mean period of 37.4 ± 8.48 weeks of treatment, the patients were either discharged or discharged themselves from the TBS. At presentation with their complications in the hospital, 52(43%) believed the TBS were undesirable and 25 (20.7%) believed the TBS were out rightly dangerous, 28(23.1%) of the patients still felt the TBS were good and only needed some training. Another finding was that 21(75%) patients of those who said the TBS were good had secondary education and above.

The cost of treatment of closed injury (except femoral fractures) which accounted for 93(76.9%) injuries in this study was actually more expensive at the TBS. Cost of such treatment ranged from \$18–\$380 with the TBS while the cost of treating similar injuries at NOHI ranged from \$34–\$98.

At the end of six months of follow up, 68(56.2%) patients had been treated; of these; 13 had insufficient follow up and were therefore excluded from the follow-up analysis. 24(19.8%) patients were lost to follow up soon after presentation and 29(19.8%) patients were not treated at all, mainly for financial reasons.

Table 3 shows the method and the outcome of orthodox treatment of these complications.

DISCUSSION

The findings in respect of the 121 patients studied showed that the patronage of the TBS and the consequent problems remain an important and complex issue in the health care system

in Nigeria. Patronage as shown in this study is determined by several factors. Many patients patronized the TBS for financial reasons. This fact is supported by previous studies.^{2,9,13} Furthermore, 98(81%) of the population in this study were people in the informal sector of the economy who had to pay for health by “out of pocket” method and people who actually had no access to any income. Professionals working in the private sector who probably have access to company paid health services accounted for only 4(3.3%) patients. However, this study has shown that contrary to the popular belief, it is cheaper to treat closed fractures particularly of the upper limbs and the leg in the hospital. An important difference however is that multiple little payments and payments in kind are allowed by the TBS.

Other important patronage determinant factors included the opinions of family and friends. 36(25%) patients were persuaded to seek treatment at TBS by this group of people. The influence of this group is important because of the existing social system in Africa where family and friends will normally contribute towards defraying the cost of treatment. In another study by Solagberu⁹ in Ilorin, 74.9% of the studied population was urged to visit the TBS by this group of people. Nevertheless, the result of these studies further raises the fundamental issue of lack of confidence in modern orthopaedic practice by the general population.

While the orthodox practitioners have little control over the above stated reasons for patronage of TBS, it is note worthy that some of the activities of the orthodox practitioners like strike actions also contributed to this problem.

The injuries treated by the TBS involved virtually all bones and joints of the body. Studies have shown that there is a greater preponderance of patients with closed injury presenting to the TBS^{4, 8} this was confirmed by this study. 93(76.9%) patients were closed injuries. It would appear that the TBS usually reject open injuries.

The most commonly involved bone in the study was the humerus involving 36(29.0%) patients; supracondylar fracture in children was responsible for

17(47.2%) of the humeral injuries. This is similar to the finding by Garba et al¹⁰ in Zaria where humeral fractures were responsible for 31% of cases. In the study by Onuminya et al⁴, supracondylar fractures were responsible for 60% of the cases seen.

Twenty joint injuries were managed by the TBS in this study; the outcome of the TBS treatment was poor. All the 13 dislocations remained unreduced at presentation with four of them involving the hip developing avascular necrosis and severe degenerative changes after a mean period of 40.2 weeks of treatment by the TBS. The ankle dislocations developed severe degenerative changes with one case having talar avascular necrosis and eventually had tibio-calcaneal arthrodesis. The elbow dislocations developed heterotopic ossification and absent or markedly reduced range of motion. The subluxations also fared poorly, three of them developed joint instability and the 4 involving the ankle developed severe degenerative changes in addition. Similar trend were noted in other studies, 16% of the patients seen at Ibadan by Alonge et al⁸ were joint injuries and all had chronic joint dislocations at presentation. As in this study, the TBS offered no solution; the patients had their dislocations unreduced for periods ranging from 9 to 60 weeks.

The most studied complication of TBS treatment is "bonesetters" gangrene.^{4,5,8,10-13} In the study by Onuminya et al⁴ over a three-year period, 15 of the 25 cases were limb gangrene; all involved the upper limb, 12 were from humeral fractures and three from elbow dislocations. In another study by Alonge et al,⁸ two of the 25 cases were gangrene. 'Bonesetters' treatment was responsible for 39.6% of the amputations at Zaria over a ten year period.¹⁰ The upper limb was involved in 24 of the 89 cases seen, particularly supra-condylar fractures in children, while the lower limb was involved in 47 cases. Other studies have also shown bonesetters gangrene as a leading indication for amputation in other parts of Nigeria.^{4,6,7}

Seven of the eleven patients with gangrene in this study (63.6%) were from bone injuries while 4(36.4%) were from soft tissue injuries. Overall, 4(36.4%) of

the injuries involved the upper limb and seven (63.6%) the lower limb. All these clearly show that no type of injury in terms of location or severity is spared this complication. Five (45.5%) of these patients were educated.

An identified problem in the practice of the TBS remains the method of diagnosis; it is shrouded in mystery^{4,8} and at best can be described as controversial. This faulty ability to diagnose is best illustrated by their application of splint to purely soft tissue injuries in 4(36.4%) of the cases that resulted in gangrene in this study. This was also demonstrated in the study by Onuminya et al⁴ where dislocations of the elbow were unreduced and splinted accounting for 16% of the amputations in that study. This constant inability to make diagnosis and refer patients appropriately appears to be one of the important differences between the Nigerian bone setters and the Turkish\Chinese traditional medicine practitioners.⁶ It is a measure of the very strong African belief and culture^{2,4,8,9,11} that despite all the enumerated problems created in the health system and in the community by the bone setters, 28(23.1%) of the victims in this study still believe that the bone setters are good but only need some tutoring.

At the end of six months of follow up, 55(45.5%) patients had been treated and followed up to monitor outcome of treatment, while 24(19.8%) were lost to follow up, 29(24.0%) were not treated at all for the various reasons. The mean interval between presentation and treatment was 16.3 weeks. The reason for this long interval is mainly the inability of the patients to pay for surgery early enough. Secondly, the cost of their surgery by policy was fifty percent higher than fresh cases seen at the centre of study.

Overall, the outcome of Open Reduction and Internal Fixation in these patients was generally just fair. This is because though union was achieved in ten of the thirteen patients (76.9%), they were associated with functional or cosmetic problems. The poor outcome of three (23.1%) out of 13 cases of ORIF seen in this study is high, but not unexpected.

Overall, the outcome of treatment of these patients is fraught with problems

including complications of treatment. This is because the complicated cases are more difficult to operate, require extensive dissection and are prone to damage to vital structures. They often require more blood transfusions and they are associated with osteoporosis which makes fixation more difficult. A number of these patients will require a second surgical procedure as in the 3(23.1%) with implant failure in the study.

The result of the study may be a tip of the iceberg as many of these patients never present to any hospital for help. It is clear that the management of bony and soft tissue injuries by bone setters produces poor results. However, frustrations with the orthodox health system have contributed in no small measure to the patronage of alternative practitioner.⁵ 52(43%) of the patients in this study and 40% of the patients in the study by Solagberu⁹ presented first to the hospital, if the orthodox practitioners could retain this number in the health system, the problem would be less. This requires an audit of our orthodox system in order to correct over inadequacies.

CONCLUSION

The result of this study serves as a reminder that treatment of musculo-skeletal injuries by the bone-setters still remains a problem in orthopaedic practice in Nigeria. An understanding of the belief system of the patients and the practice of the TBS is needed to curb this problem. It is obvious from this study that the cost of treatment which was thought to be cheaper at the TBS is actually not so, at least for closed fractures that will not require surgery. The public is being deceived by the multiple payment options at the TBS. The influence of friends and family on the patient, cultural beliefs, unnecessary bottlenecks in hospitals, attitude of health workers and work stoppages are valid factors that encourage the patronage of the TBS.

The outcomes of treatment of these complications have shown that the results can not be One hundred percent satisfactory as there will be residual functional or cosmetic problem after treatment. It is obvious from this study therefore, that the TBS are dangerous to the society, at least as presently practiced. The studied population however has a

lot of confidence and belief in the ability of the bone setters despite the complications. Therefore, any recommendation that fails to take this into consideration is bound to fail.

A scientific approach to solving this problem is the training of the TBS. This was demonstrated by Onuminya¹⁴ and Eshete¹⁵ in their studies as morbidity was reduced following training of the TBS.

REFERENCES

1. Orjioko CJG. Does traditional medicine have a place in Primary Health Care? *Orient Journal of Medicine* 1995; **7**: 1–3.
2. Thanni LOA. Factors influencing patronage of traditional bonesetters. *WAJM* 2000; **19**: 220–224.
3. Oginni LM. The use of Traditional fracture splint for bone setting. *Nigerian Medical Practitioner* 1992; **24**: 49–51.
4. Onuminya JE, Onabowale BO, Obekpa PO, Ihezue CH. Traditional Bonesetter's Gangrene. *International Orthopaedics (SICOT)* (1999); **23**: 111–112.
5. Onuminya JE. The role of the traditional bone setter in Primary fracture care in Nigeria. *S. African Medical Journal*. 2004; **94**: 652–8.
6. Hatipoglu S, Tatar K. The strength and weaknesses of Turkish bone setters. *World Health Forum*. 1995; **16**: 203–205.
7. OlaOlorun DA, Oladiran IO, Adeniran A. complications of fracture treatment by traditional bone setters in Southwest Nigeria. *Fam Pract*. 2001; **18**: 635–7.
8. Alonge, TO, Dongo AE, Nottidge TE, Omololu AB, Ogunlade SO. Traditional bone setters in South Western Nigeria – Friends or Foes? *WAJM*; 2004; **23**: 81–84.
9. Solagberu BA, Long bone fractures treated by TBS; A study of patients' behaviour. *Tropical Doctor* 2005; **35**: 106–107.
10. Garba ES, Deshi PJ, Iheirka KE. The role of traditional bone setters in limb amputation in Zaria, *Nigerian Journal of Surgical Researches* 1999; **1**: 21–24.
11. Garba ES, Deshi PJ. Traditional bone setting: a risk factor in limb amputation. *East Afr Med J* 1988; **75**: 553–5.
12. Yakubu A, Mohammad I, Mabogunye O. Limb amputation in children in Zaria, Nigeria. *Ann Trop Paediatric*. 1995; **15**: 163–5.
13. Omololu B, Ogunlade SO, Alonge TO. The complications seen from the treatment by traditional bone setters, *WAJM*; 2002; **21**: 335–337.
14. Onuminya JE performance of a trained traditional bonesetter in primary fracture care. *S Afr Med J*. 2006; **96**: 320–2.
15. Eshete M. The prevention of traditional bone setter's gangrene. *J Bone Joint Surg Br*. 2005; **87**: 102–3.