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Article in East and Central African Journal of Surgery · April 2024

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PERSPECTIVE

The continued role of traditional bonesetters in East and West Africa: An expert consensus statement

Morgan R. Askew^{1,2}, Carrie Hinchman^{1,3}, Isaiah M. Rayel^{1,4}, Preston Jenkins^{1,5}, Adedamola Dada^{6*}, Malick Diallo^{7*}, Mengistu G. Mengesha^{8*}, Dominic Konadu-Yeboah^{9*}, Henry T. Ndasi^{10*}, Ndubuisi O. Onyemaechi^{11*}, Kiran J. Agarwal-Harding^{1,12}

¹Harvard Global Orthopaedics Collaborative (HGOC), Boston, MA, USA • ²The Warren Alpert Medical School of Brown University, Providence, RI, USA • ³New York Medical College, Valhalla, NY, USA • ⁴National University Ireland Galway School of Medicine, Galway, Ireland • ⁵University of Florida College of Medicine, Gainesville, FL, USA • ⁶Department of Orthopedic Surgery, Federal Medical Centre, Ebute-Metta, Lagos, Nigeria • ⁷Department of Orthopedic Surgery, Institut Supérieur des Sciences de la Santé, Bobo-Dioulasso, Burkina Faso • ⁸Department of Orthopedic Surgery, Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia • ⁹Department of Trauma and Orthopaedics, Komfo Anokye Teaching Hospital, Kumasi, Ghana • ¹⁰Department of Orthopedic Surgery, Baptist Hospital Mutengene, Mutengene, Cameroon • ¹¹Department of Orthopedics and Trauma, University of Nigeria, Nsukka/University of Nigeria Teaching Hospital, Ituku-Ozalla, Nigeria • ¹²Carl J. Shapiro Department of Orthopaedics, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA

*Members of the HGOC Expert Panel on Traditional Bonesetters (listed alphabetically)

Correspondence: Dr Kiran J. Agarwal-Harding (kahardin@bidmc.harvard.edu)

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East Cent Afr J Surg. 2023;28(1):4-9
<https://doi.org/10.4314/ecajs.v28i1.2>

Abstract

Traditional bonesetting (TBS) is an ancient practice still used worldwide to treat common musculoskeletal conditions, particularly in low- and middle-income countries. This practice is highly controversial, lacking standardized training of traditional bonesetters, and it is associated with a high risk of avoidable life- and limb-threatening complications. In East and West Africa, high-quality and safe modern orthopaedic services remain inaccessible and unaffordable for many patients who then rely on traditional bonesetters for essential musculoskeletal care. Even when orthopaedic services are available, many patients preferentially patronize traditional bonesetters because of traditional beliefs, social pressures, and fear or mistrust of modern biomedicine. Orthopaedic surgeons must raise public awareness of TBS-related complications and engender trust in modern orthopaedic services. However, traditional bonesetters can fill important gaps in musculoskeletal care, particularly in rural areas, provided they undergo basic training. Traditional bonesetters and orthopaedic surgeons alike generally favour TBS practice standardization, regulation, and integration into existing primary care systems, with initiatives to do so showing promising results. Further investigation is necessary to understand the prevalence of TBS-related complications in East and West Africa. To reduce TBS-related complications, we must endeavour to broaden access to essential orthopaedic services as well as train and integrate traditional bonesetters into the healthcare systems of regions where they have practised for centuries.

Keywords: traditional bonesetters, orthopaedic trauma, orthopaedic surgery, musculoskeletal health, global orthopaedics, bonesetter's gangrene, rural healthcare, health equity, sub-Saharan Africa

Introduction

Traditional bonesetting (TBS) is an ancient practice of musculoskeletal care that has existed with varied popularity over time on all inhabited continents.^{[1]-[4]} With the widespread adoption of evidence-based medicine worldwide, modern orthopaedic surgery has largely replaced TBS, especially in resource-rich settings. However, in many low- and middle-income countries and under-resourced settings worldwide, safe orthopaedic and trauma surgery remains inaccessible for many.^[5] In East and West Africa, traditional bonesetters continue to care for many patients with a wide

array of musculoskeletal injuries and pathologies, including fractures, dislocations, congenital deformities, soft tissue injuries, back pain, malignancies, and infections.^{[6],[7]} The practice of TBS remains controversial, believed by many orthopaedic surgeons to be inferior to modern evidence-based practices and a source of avoidable complications. However, in some communities, despite available orthopaedic surgical services, patients may prefer TBS treatment owing to strong cultural and community beliefs.^{[8]-[11]} We therefore sought to examine current perspectives on TBS and foster a dialogue on the topic between orthopaedic surgeons from East and West Africa.

Methods

To better understand current perspectives on traditional bonesetters among East and West African orthopaedic surgeons, the Harvard Global Orthopaedic Collaborative (HGOC) assembled a 6-member panel of orthopaedic surgeons from Burkina Faso, Cameroon, Ethiopia, Ghana, and Nigeria for a virtual discussion on 2 April 2021. Panellists were primary authors of peer-reviewed articles or actively engaged in scientific investigation on the topic of TBS (Table). All panellists were senior orthopaedic surgeons, active in clinical practice, who had patients in common with traditional bonesetters. This consensus statement represents the expert opinion of all panellists.

Consensus statements

Key panel consensus statements regarding TBS in East and West Africa are elaborated below:

- TBS is associated with a high risk of avoidable life- and limb-threatening complications
- Inadequate access to safe and affordable orthopaedic services increases dependence on TBS
- Many patients prefer TBS to modern orthopaedic surgery for specific reasons
- Orthopaedic surgeons must work to raise public awareness of TBS complications and engender trust in modern orthopaedic services
- TBS can be integrated into community-based healthcare systems through training and scope of practice regulation to limit complications

TBS is associated with a high risk of avoidable life- and limb-threatening complications

TBS is often passed down through familial apprenticeships and lacks standardized training or evidence-based best practices in musculoskeletal care. Treatment can involve inadequate fracture reduction, tightly applied circumferential splints and dressings, nonsterile techniques, poor infection control, and poor patient selection.[11] Thus, complications are common, especially fracture malunion, nonunion, infection/osteomyelitis, compartment syndrome, and autoamputation.[6],[11],[12] Severe infections and limb ischemia can progress to sepsis and even death.

For some nondisplaced or minimally displaced fractures, sprains, strains, abrasions, or contusions, traditional bonesetters may provide safe and appropriate treatment, especially if they have undergone basic training on splinting, sterile technique, and identifying complications.[7],[13],[14] However, in the panellists' experience, even minor orthopaedic injuries can be inappropriately managed and result in severe, avoidable complications. A common example is the Gartland type I paediatric supracondylar humerus fracture, which can be successfully treated with an arm sling,[15] but traditional bonesetters sometimes use compressive circumferential splints or bandages that result in compartment syndrome, Volkmann's ischemic contracture, and even limb ischemia—the so-called “bonesetters gangrene”.

We believe that the practices of traditional bonesetters, which are unregulated and not evidence-based, result in an unacceptably high rate of avoidable complications. In addition to the risk of TBS treatment itself, patients who initially consult traditional bonesetters will present late to an orthopaedic surgeon, which can result in worse outcomes than those who receive orthopaedic surgical treatment first.[11] Simple injuries can be complicated by TBS, and orthopaedic surgeons in East and West Africa are then faced with complex pathology, further straining already overburdened health systems. When the orthopaedic surgeon must take extreme measures like performing limb amputation to manage TBS-related complications like wet gangrene, it reinforces prejudices and fears that many patients have about orthopaedic surgery, and this further complicates efforts to provide timely and safe care.

Inadequate access to safe and affordable orthopaedic services increases dependence on TBS

The incidence of musculoskeletal injuries is disproportionately higher in low- and middle-income countries, where access to essential trauma care and surgery remains inadequate.[16]–[19] East and West Africa have too few orthopaedic surgeons, and most are located in urban centres, inaccessible to poor and rural patients.[7],[20],[21] Traditional bonesetters often practise in rural communities where they are accessible, affordable, and trusted members of the community. In fact, Dada et al.[10] in Nigeria found that 57% of patients with fractures had first presented to a bonesetter. Many patients view TBS as more affordable—especially in settings without health insurance or universal health coverage for trauma patients—and value bonesetters' payment flexibility, specifically being able to pay in monetary instalments, on a sliding scale, or with the exchange of goods, commodities, or services.[7],[10]

Accessibility and affordability notwithstanding, inadequate quality and safety of orthopaedic services also push patients to preferentially seek TBS. The few orthopaedic surgeons in East and West Africa are geographically maldistributed, and musculoskeletal pathology is often managed by nonphysician clinicians, nonsurgeon physicians, nonorthopaedic surgeons, or surgical trainees.[22],[23] Training and supervision of hospital staff can be inadequate and result in poor patient selection and clinical decision-making, poor surgical and sterile technique, incomplete follow-up, and failure to manage complications. Unscrupulous clinical practices and corruption also erode trust in health systems.[24] Even with adequate training and supervision, inadequate health system development means many surgeons struggle with insufficient operative capacity, inadequate and poor-quality materials and implants, and a large volume of patients in need of care.[17],[19] The resulting inadequate, delayed, and incomplete treatment of patients further erodes trust in orthopaedic surgeons and pushes patients to traditional bonesetters instead.[10] If orthopaedic services are perceived as inaccessible, unaffordable, or unsafe, patients will continue to patronize traditional bonesetters.

Table. Panellist biographies

Adejuwon Adedamola Dada, MBBS, FWACS, FMCS, FICS, is the chief executive officer of the Federal Medical Centre in Ebute-Metta, Lagos, Nigeria. He graduated from the University of Ilorin and trained as an orthopaedic and trauma surgeon at the National Orthopaedic Hospital, Igbobi, Lagos, with specialist qualifications from the West African College of Surgeons and the Nigerian Postgraduate Medical College. He has also undergone various fellowship training programmes at hospitals in South Africa, Spain, Switzerland, and France. He completed his postgraduate dissertation on “Complications of Traditional Bone Setters’ Treatment”.

Malick Diallo, MD, MA, is an orthopaedic surgeon and senior lecturer at Institut des Science de la Santé in Bobo-Dioulasso, Burkina Faso. He graduated from Université de Ouagadougou and trained as an orthopaedic surgeon at Université Cheikh Anta Diop de Dakar in Senegal. His research interests include orthopaedic trauma and managing orthopaedic malignancy in low-resource settings.

Mengistu Gebreyohanes Mengesha, MD, FCS (ECSA), is a consultant orthopaedic surgeon and assistant professor of orthopaedic surgery at Hawassa University Comprehensive Specialized Hospital in Hawassa, Ethiopia. He graduated from Mekelle University and trained as an orthopaedic surgeon at Tikur Anbessa Hospital in Addis Ababa, Ethiopia. He is the principal investigator for the Ethiopian BOSAD (Bone Setting Associated Disability) study.

Dominic Konadu-Yeboah, MBChB, MPH, FWACS, FGCS, is a trauma and orthopaedic surgeon and senior lecturer at Kwame Nkrumah University of Science and Technology in Kumasi, Ghana. His research includes the examination of complications from, patient preference for, and education of traditional bonesetters in Ghana.

Henry Ndasi, MD, is an orthopaedic surgeon and chief medical officer at Baptist Hospital Mutengene, Cameroon. He graduated from Bayero University and trained in general surgery with the Pan African Academy of Christian Surgeons (PAACS)/Loma Linda University. He trained in orthopaedic surgery and paediatric rehabilitation at Cure International Children’s Hospital in Kenya. His clinical practice is 60% orthopaedic trauma, but he also manages paediatric deformity surgery, acute care surgery, and some emergency obstetric/gynaecologic surgery.

Ndubuisi Onu Onyemaechi, MD, FWACS, FICS, is an associate professor and honorary consultant at the University of Nigeria, Nsukka/University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, Nigeria. He graduated from the University of Nigeria and trained in orthopaedics and trauma with the West African College of Surgeons. His research examines the feasibility of a formal training programme for traditional bonesetters and the integration of traditional practitioners into the primary healthcare system.

Many patients prefer TBS to modern orthopaedic surgery for specific reasons

Traditional bonesetters are patronized by patients of all ages, from urban and rural settings, and all socioeconomic and education levels—not just the rural poor without access to orthopaedic surgeons.[4],[6],[8],[10],[25]–[28] In fact, some patients would recommend TBS over orthopaedic treatment.[6],[26],[29] Several studies conducted in Nigeria, Ghana, Tanzania, and Sudan have shed light on patients’ rationale for this preference, and this is corroborated by the panellists’ clinical experience. In addition to the financial reasons discussed above, TBS remains a preferential option for many patients in East and West Africa for social and cultural reasons.[8]–[11],[29],[30] Fear of plaster, surgery, and especially amputation are common reasons for patients initially consulting traditional bonesetters.[6],[8],[29] This is unfortunately exacerbated by poor outcomes of TBS and delays in presentation to an orthopaedic surgeon, which increase the risk of surgery and amputation.

Patients may also avoid presenting to hospitals because of mistrust of health workers, perceived delays in treatment, hospital bureaucracy, inadequate hospital resources like beds

or bathrooms, language barriers, and limited time with physicians.[6],[8] Patients’ cultural beliefs, pressure from family and friends, and faster access to care also inform the choice of TBS over orthopaedic surgical care.[6],[8],[10] Traditional bonesetters are uniquely positioned in local communities to provide musculoskeletal care to patients. They tend to be widely respected because their care is considered affordable and efficient, they have time to devote to each patient, and they often provide culturally valuable spiritual care, which patients may feel is lacking from institutional orthopaedic services.[31]

Orthopaedic surgeons must work to raise public awareness of TBS complications and engender trust in modern orthopaedic services

Research is an essential tool to help orthopaedic surgeons understand the prevalence of TBS and its associated complications.[12] A study conducted in Nigeria found that TBS-associated complications caused 10% of all extremity amputations over 1 year (N=87),[32] and another study conducted in Nigeria demonstrated a rate of 16.1% over 7 years

for patients aged 3 to 89 years (N=112), including 62.5% for children aged 3 to 16 years (n=22).[33] A southern Ethiopian hospital found that TBS complications caused 51% of all amputations (N=49) over 2 years,[34] and another more recent study found the rate to be 55.5% over 10 years (N=102).[35] The BOSAD (Bone Setting Associated Disability) study is currently underway in Ethiopia and The Gambia, collecting valuable data and helping raise public awareness regarding TBS-associated complications. Similar studies aimed at documenting bonesetter-related complications and the complex reasons that lead patients to first seek the services of a bonesetter before consulting an orthopaedic surgeon are also underway in Ghana. The knowledge gained from international epidemiologic studies can guide strategic solutions like public advocacy campaigns, medical training, and collaborations between traditional bonesetters and surgeons.

Broadly speaking, we believe that public advocacy campaigns must address the fear and mistrust that patients have towards hospitals and surgeons and encourage patients with major musculoskeletal injuries to present to orthopaedic surgeons first for evaluation and treatment.[6],[29] These campaigns should communicate the locations where patients can receive care and the most affordable modes of transportation to such locations. Campaigns should explain the safety and efficacy of sterile orthopaedic implants. Positive patient testimonials that spotlight high-quality care and compassionate surgeons, as well as the buy-in and support from trusted community leaders, can all help assuage the fear of orthopaedic surgery. Through public interviews with exemplary orthopaedic surgeons and their support staff, patients will gain a deeper understanding of common orthopaedic practices and how these practices might differ from TBS. A focus on safety and positive outcomes should be central to all advocacy campaigns.

Finally, and perhaps most importantly, each patient encounter should strengthen trust in orthopaedic surgery. With openness, integrity, and compassion, orthopaedic surgeons must directly engage with patients to build trust around treatment plans, as well as discuss alternatives and complications, follow-up care, and rehabilitation.

TBS can be integrated into community-based healthcare systems through training and scope of practice regulation to limit complications

The high rate of TBS-associated complications has led some to condemn traditional bonesetters and call for the eradication of their practices.[36] However, patients throughout East and West Africa will continue to patronize traditional bonesetters for a variety of reasons, so we agree with many others who have articulated an urgent need for collaboration and, in some cases, integration of traditional bonesetters into formal community-based healthcare systems.[14],[31],[34],[37] Traditional bonesetters and patients alike express frustration at hospital-level musculoskeletal care, which they feel lacks adequate follow-up and mutual trust between patients and physicians. However,

Card et al.[7] showed that, in Tanzania, some bonesetters recognize the limitations of their practice and, therefore, refer patients to orthopaedic surgeons. In this way, traditional bonesetters play a role in the referral pathway. With appropriate training and regulation, bonesetters could help triage patients, provide safe care, and assist with follow-up, especially in rural communities. Bonesetter training programmes and regulations are, therefore, a central component of proposed future collaborations, and the panellists' experience is that some traditional bonesetters (and surgeons) are receptive to it. Eshete,[34] in Ethiopia, implemented a multi-tiered training programme with 112 traditional bone setters, 10 community health workers, and 15 local leaders to address gangrene as a complication of TBS. The rate of amputations resulting specifically from excessively tight splinting decreased from 51% to 28%. Moreover, a community-based survey in Kenya revealed that many patients themselves may be in favour of the integration of TBS into the formal healthcare system.[28] However, collaborations between bonesetters and surgeons must be tailored to local contexts, which may differ greatly throughout East and West Africa.

In addition to training, the integration of traditional bonesetters into institutionalized healthcare can help hold bonesetters accountable for patient outcomes.[14] For example, the establishment of the Traditional and Alternative Medicine Board in Nigeria has helped register and micro-credential bonesetters. The establishment of a professional TBS organization in Nigeria—ASTRABON (Association of Traditional Bonesetters of Nigeria)—has created a point of contact for formal collaborative discussions between bonesetters and surgeons. The Traditional and Alternative Medicine Practice Council and the recently established Traditional Bonesetters Association have provided platforms for engagement with traditional bonesetters in Ghana.

Conclusions

Traditional bonesetting remains common in East and West Africa and is associated with a high risk of avoidable complications. Inadequate access to safe and affordable orthopaedic services means many patients have no choice but to patronize bonesetters. It is the consensus opinion of the panellists, therefore, that broadening access to essential orthopaedic services in East and West Africa is a critical step in reducing TBS-related complications. However, even when orthopaedic surgical services are available, many patients prefer TBS for social and cultural reasons, as well as because of dissatisfaction with institutional healthcare. We believe that orthopaedic surgeons must work to raise public awareness of TBS-related complications and engender trust in modern orthopaedic services.

We also believe that to improve access to essential musculoskeletal care, TBS should be incorporated into community-based health systems through formal training, the establishment of treatment algorithms, regulation, and professional accountability. Bonesetters and orthopaedic surgeons alike have described referral systems and training programmes that could reduce dangerous complications. The future of high-quality musculoskeletal care in East and West Africa

depends on many complex factors, but we believe it will be necessary to understand the prevalence of TBS-related complications, as well as train and integrate bonesetters into the healthcare systems of the regions where they have been practising for centuries.

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Peer reviewed

Competing interests: None declared

Received: 15 Mar 2022 • **Revised:** 28 Jun 2023

Accepted: 26 Sep 2022 • **Published:** 29 Apr 2024

Cite this article as: Askew MR, Hinchman C, Rayel IM, et al. The continued role of traditional bonesetters in East and West Africa: an expert consensus statement. *East Cent Afr J Surg*. 2023;28(1):4-9. doi:10.4314/ecajs.v28i1.2

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