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Limb Gangrene following Treatment of Limb Injury by Traditional Bone Setter (TBS): A Report of 15 Consecutive Cases.

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This study is done to evaluate cases of limb gangrene resulting from treatment of limb injury by traditional bonesetter.
***Method**: This is a prospective study in which patients with limb gangrene are evaluated as each presents. Data extracted for evaluation include history of having been to a traditional bonesetter, the original injury, type of treatment given by the traditional healer, progression of condition while on treatment and reason for not coming to orthodox orthopaedic centre ab initio for treatment.*
***Results**: 15 cases were seen during the 5-year of study spanning June 1997 to May 2002. Upper limbs were involved in 4 cases while 11 involved the lower limbs. The original injuries were 3 cases of soft tissue injury to the joints, 7 closed fractures and 5 open fractures of type I and II. There was associated sepsis and toxemia in all except one. All the cases were treated by amputation. There were 4 deaths.*
***Conclusion**: Limb gangrene was not a justifiable end-result of treatment in all the cases judging by the nature of the original injury. Reasons for this end result were adduced. The need to avert unnecessary limb loss from mismanagement of limb injury by education of public in general and enlightenment of the traditional bonesetters of the harmful procedures in their practice is highlighted.*

Key words: traditional bonesetter; limb gangrene; complication following treatment.

Traditional bonesetter, who is he? Chamber's English dictionary defines tradition as a practice, belief, or tale handed down from generation to generation usually by oral transmission; and bonesetter as one who treats broken bones without being a duly qualified surgeon[1].
The traditional bonesetter could then be said to be an untrained and therefore unqualified orthopaedist whose practice was handed down to him by his forebears. Traditional bonesetters abound in our community, in both urban and rural areas. They are highly patronised by those with orthopaedic problems especially limb injuries. Most times they are the first to be seen in the treatment of limb injuries especially in the rural areas where orthodox orthopaedic health care services are non-existent.
Complications of their method of treatment of limb injuries including limb gangrene have been variously reported in Nigeria [2,3,4].

Limb gangrene as an end-result of any treatment of limb ailment is a disaster because there is no more salvage. Invariably an amputation of the limb or part of it is the outcome resulting in life-long disability. Limb gangrene, however, may sometimes be a natural end-result of limb injury in view of the nature of the injury.
The aim of this study is to evaluate cases of limb gangrene resulting from treatment of limb injury by traditional bonesetters, against the background of the original injury to see if the gangrene would have been a natural end-result.

Patients and Methods

This is a prospective study in which cases of limb gangrene following trauma with a history of having been to traditional bonesetter are evaluated as they present. Cases of diabetic foot were excluded.
The study was carried out over five years spanning from June 1997 to May 2002 at Hilltop Orthopaedic Hospital

Enugu. Data extracted from the patients include age, history of injury before intervention by the traditional healer (original injury), type of treatment given by the traditional bonesetter, and progression of the condition of the injured limb while on treatment and reasons for not coming to the Orthodox Orthopaedic Hospital *ab initio*.

Each patient's involved limb is X-rayed and diagnosis of the original injury is made. The presenting clinical state is assessed. The patient is resuscitated and control of infection initiated. Appropriate level for amputation is decided. The patient and their relations are duly informed and consent obtained. Then the amputation is carried out.

Results

During the period under review15 cases were seen. 900 hospital admissions were made over the same period. Their age range varied from I year to 83 years with male: female ratio of about 7:1

Even though different traditional healers were seen, the history of their methods of treatment is essentially the same. They start with application of herbal concoction on the injured limb. Thereafter a splint made of bamboo sticks held in place by threaded rope (fig 1) is applied over the swollen injured area. Swelling of the limb distal to the splint usually increases. Then blisters appear. There is increase in pain, which the patients are usually encouraged to bear for their final good. Some blisters peel off to form weeping sores. After few days the swollen limb losses its colour and looks pale and feels cold when touched and;colour gradually darkens. The sores increase in size as they coalesce and there is increase in the discharge of serous fluid. Fever is usually felt during this period. Later the serous discharge changes to pus and is foul smelling. Wounds from original injury equally discharge pus at this stage.

At this stage, they are advised by the traditional healer to go to orthodox hospital for x-ray or for further treatment or the patients themselves, elect to leave and seek treatment elsewhere.

The various reasons for going to the traditional healers first instead of orthodox orthopaedic centre include:

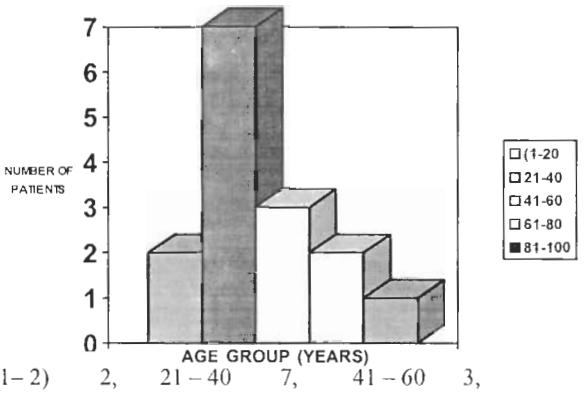
1. Non-availability of orthodox orthopaedic centre in the vicinity.
2. Fear of higher cost of treatment.
3. Faster attention from traditional healer.
4. Fear of losing the limb because of the belief that Orthopaedic surgeons do not give enough chance as the traditional healers do to see if the limb could be saved.
5. Belief that traditional bonesetter's method of treatment is faster and better when it comes to healing of broken bones.

In the 15 cases seen, the upper limbs were involved in 4 cases and lower limbs were involved in 11 cases. The original injuries include 3 cases of soft tissue injury of joints without bony involvement including that of the one year old who is the youngest of all the patients, 7 had closed fractures while 5 had Gustilo-Anderson types I and II open fractures[5].

With the exception of the youngest patient that presented as dry gangrene, all the others were grossly infected with offensive discharge and toxaemia. One patient had tetanus while one had gas gangrene. There were 4 deaths, which included the tetanus and gas gangrene patients.

The patients' original injury and other clinical data and outcome are as shown in table i.

Fig. 1: **Gangrenous limb showing a splint made of bamboo sticks.**



(1 – 2) 2, 21 – 40 7, 41 – 60 3,
61 – 80 2, 81 – 100 1.

Fig. 2: **Age Distribution of 15 Patients presenting with Limb Gangrene.**

Fig. 3: **Gross infection with discharge and toxaemia.**

Fig. 4: Shows swelling of limb distal to splint.

Fig. 5: Blister peel off, leaving weeping sores.

Table i: **Clinical data of 15 patients presenting with Limb gangrene.**

	Age	Sex	Original Injury (Yr)	Diagnosis on	Treatment	Outcome Presentation
1	1	F	Soft tissue injury (L) Elbow	Gangrene (L)	A/E amputation	Discharged
2	9	M	Closed supracondylar # (L) humerus	Gangrene whole (L) arm	Shoulder disarticulation	Discharged
3	24	M	Type 1 open # (R) Leg	Gangrene (R) leg	A/K amputation	Discharged
4	26	M	Type 11 open # (R) leg	Gangrene (R) leg	B/K amputation	Discharged
5	28	M	Closed # (R) Leg	Gangrene (R) leg	B/K amputation	Discharged
6	29	M	Type 1 open (L) LEG	Gangrene (L) leg	B/K amputation	Discharged
7	32	M	Type 1 open # leg	Gangrene (L) leg	A/K amputation	Died
8	32	M	Closed # (R) Leg	Gangrene (R) leg	B/K amputation	Discharged
9	36	M	Closed # (R) humerus	Gangrene forearm	A/E amputation	Discharged
10	41	M	Closed # (L) forearm	Gangrene (L) forearm	A/E amputation	Discharged
11	43	M	Closed # (R) leg	Gangrene (L) leg	A/E amputation	Discharged
12	48	M	Closed # (L) leg	Gangrene (L) leg	A/K amputation	Discharged
13	71	M	Type 11 open # (L) leg	Tetanus & Gangrene (L) leg	A/K amputation	Died
14	72	M	Soft tissue injury (R) ankle	Gangrene (R) Leg	B/K amputation	Died
15	83	M	Soft tissue injury (R) ankle	Gangrene (R) Leg	B/K amputation	Died

Discussion

Mc Collister Evarts in his treatise on historical highlights in orthopaedics observed that in the evolution of orthopaedic practice primitive (traditional) bonesetters certainly played a role and use of crude splints was at a time accepted in all civilised cultures[6].

There is therefore no gainsaying the usefulness of primitive (traditional) bonesetters in early orthopaedic practice even

in civilised world.

Limb gangrene as a sequel of limb injury can sometimes be a natural end result if the nature of the injury is such that the limb or its blood supply is severely damaged and every effort made to salvage the limb has failed. But if it is iatrogenic, then it is certainly a calamity, and condemnable no matter who inflicted it because of the obvious consequences of lifelong disability.

In the 15 cases of limb gangrene seen following treatment of limb injuries by traditional bonesetters, none is a justifiable end-result considering the nature of the injuries sustained. All were iatrogenic.

The reason for this is obvious and has been observed by other workers[2,3].

The traditional bone setter's crude fracture splint (fig 1) is applied once one presents with limb injury whether there is fracture or not because radiological examination is not usually done .The splint is applied over the injured area. When therefore the post-traumatic inflammatory response to injury with its accompanying swelling ensues, the in-expansible splint resists the swelling thus producing tourniquet effect. The result is compartment syndrome which if not interfered with leads to distal limb gangrene. So this situation arises when the splint is applied early following injury.

The blisters arising during the compartment syndrome phase rupture to leave raw surfaces, which get infected from the herbal concoctions usually applied with dirty hands as part of treatment resulting in wet gangrene. It is pertinent to note that in three cases including the one year old, only the soft tissues of the joints were injured (table i) as the X-rays did not show any bony involvement.

Most of those involved, (50%) fall between the age range 21- 40 years (fig 2), which is the most productive age range. This is not surprising since trauma is the cause of the original injury and will therefore involve more of the most active age group.

Mortality of 4 (26%) is high compared with that of 0 – 10% usually associated with amputation[7]. This high rate is due to gross sepsis and toxaemia associated with these cases and late presentation when the burden of the disease is overwhelming resulting in severe debility as well.

The experience of other workers regarding iatrogenic gangrene following traditional bonesetters' treatment of limb injuries is not different from above[2,3,4]. It is obvious from the foregoing observation as regards the practice of bonesetters that the reason for the frequent iatrogenic limb gangrene following their treatment is mainly due to ignorance. Ignorance of the natural pathophysiological history of trauma and the value of asepsis and antisepsis in preventing infection.

Some of the reasons given by patients for going to traditional bonesetters *ab initio* like availability of orthodox orthopaedic centres in their vicinity, higher cost of treatment and faster attention are actually factual. But the rest are misconceptions, again based on ignorance.

Therefore, in order to avert this disaster of unnecessary limb loss from mismanagement of limb injury there is need to educate the public through all the available media (print, electronics, etc.) on proper care of the injured limb and where this could be found.

Traditional bonesetters should also be enlightened on some of the procedures in their practice that are harmful so as to do away with them.

In order to bring orthodox orthopaedic services closer to the people, the staffing of the primary health care programme should include orthopaedic nurses (nurses trained in giving basic orthopaedic care). These nurses can give basic care to the injured limb and in addition help to educate the community in which they are serving and refer cases they cannot handle to appropriate health care centres.

Conclusion

Iatrogenic limb gangrene following traditional bonesetters treatment of limb injuries (Traditional bone setters gangrene) was observed to be frequent .The reason is attributable to the early application of traditional bonesetter's crude fracture splint to the injured limb. The end result is loss of the involved limb leading to lifelong gross disability and stigma.

Amputation of the gangrenous limb was observed to be associated with higher mortality because of gross sepsis and toxemia, which usually accompany this type of gangrene and late presentation of patients when the burden of the disease is overwhelming.

The need to avert this unnecessary limb loss by educating the public in general and enlightenment of traditional bonesetters to know and therefore, drop procedures that are harmful in their practice is highlighted.

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