

Scarification in sub-Saharan Africa: social skin, remedy and medical import

Roland Garve¹, Miriam Garve², Jens C. Türp^{1,3}, Julius N. Fobil⁴ and Christian G. Meyer^{5,6,7}

1 Center for Natural and Cultural History of Man, Danube Private University, Krems, Austria

2 Department of Quality Management and Accreditation, Leuphana University, Lüneburg, Germany

3 University Center for Dental Medicine Basel, University of Basel, Basel, Switzerland

4 Department of Biological, Environmental and Occupational Health Sciences, University of Ghana, Accra, Ghana

5 Duy Tan University, Da Nang, Vietnam

6 Institute for Tropical Medicine, Eberhard Karls University, Tübingen, Germany

7 Health Focus GmbH, Potsdam, Germany

Summary

Various forms of body modification may be observed in sub-Saharan Africa. Hypotheses and theories of scarification and tribal marking in sub-Saharan Africa are described, plus the procedure of scarification, examples from several African countries, assumed effects in prevention and treatment of diseases, and the medical risks resulting from unsterile manipulation.

keywords scarification, theories of tribal marking, social significance, medical consequences of scarification, sub-Saharan Africa

Introduction

Body modification has been performed for a variety of reasons in many societies, and a plethora of historical and current forms of modifications exists. The large spectrum of artificial body modifications includes, among others, cranial and foot binding, branding and ear shaping, female genital mutilation and male circumcision, removal or enlargement of body parts, scarification and tattooing, but also modern plastic and aesthetic surgery. Notably, body modification, rather tattooing than scarification, has become increasingly frequent in industrialised countries: approximately one-third of US citizens wear tattoos, with considerable social acceptance [1]. Sadly punishment, revenge and terror by removing body parts still occur in some countries.

The skin is a clear and definite boundary between the self and the environment. Any modification of a sentient being's outer physical appearance may well, in a non-verbal way, convey indications, signals and messages to those who understand their meaning. In fact, scarification and tattooing in indigenous groups may be cultural imprints and autographs of an individual ('social skin') [2]. In anthropology, the transition and transformation of skin-associated messages into the informed perception of individuals, small groups and larger societies has long been a key issue [3]. While scarification is a culturally sanctioned measure to convey messages and signals to indicate cultural identity and to treat certain maladies,

community members reluctant to go through and tolerate the painful and traumatic procedure of scarification were often excluded from community life and from important activities, and they were not considered equally ranking members of the collective [4, 5].

We recently described the tradition of infant oral mutilation in indigenous groups in Africa and the customs of labret and lip plug wearing in several ethnic groups in Amazonia and Africa, including their medical consequences [6, 7]. Here, we focus on scarification, or cicatrization, among indigenous ethnic groups in sub-Saharan Africa.

Theories on reasons for scarification

Scarification is an archaic method performed, with a decreasing tendency, by indigenous dark-skinned ethnicities in Africa, Melanesia and Australia to achieve an irreversible optical change in the skin surface. A possible reason for preferring scars rather than tattoos is that pigments applied in tattoos are barely visible on darker skin; however, combined scarification and tattooing occur, for example among the Maori in New Zealand and the Carajá Indians in Brazil. Burkina Faso, Nigeria and Congo have been claimed to be important centres of ritual scarification [8]. Traditional African masks and wooden carvings are frequently garnished with tribal-specific symbols, which are similar to the scars observed in the respective group (Figure 1) [9].

Scarification is achieved through cuts of the skin, removal of skin parts, burns and branding, chemical imprinting, skin laceration and a variety of other techniques. Although the general acceptance of scarifications appears to be waning [10], in most cases, it is the explicit desire of an individual and his social community to achieve permanent marks and scars, frequently by artificially deferring the natural course of wound healing and even aggravating dermal restoration and repair.

As most indigenous groups in Africa, Amazonia and Asia are currently facing the near evolutionary end of their traditions and cultures, information on the meaning, signification and implications of secondary body embellishment must be preserved. Current theories addressing the reasons for body scarification and tattooing discussed among anthropologists and ethnologists are related to (i) hardening of the body, frequently experienced during the transition from childhood to adolescence and, partly overlapping, (ii) rite of passage, (iii) a non-adaptive sexually selected character and (iv) an adaptive pathogen-driven sexually selected character [11].

The hardening theory is based on the belief that any physical and emotional stress exerted on young children will allow the individual to withstand strain, both physical and mental, in its later life. Stress experienced in later life may involve a variety of situations, from any kind of conflict over sexual maturity, supernatural events to pathogen infestation. Mutilation in early life is thought to enhance strength and accelerate physical, intellectual and cognitive development, a theory supported by experiments in animals [12]. Physical stress exerted by body modification at the age of approximately two years appears to be positively associated with physical growth [13]. Among indigenous groups, ‘hardening’ is performed on infants and young children until puberty. It may include ornamental piercing, cauterisation, circumcision and scarification. In this way, young girls may demonstrate their firm ability of bearing pain at childbirth, or to indicate their first menstruation. An important ‘hardening’ process is ‘infant oral mutilation’ (IOM), where teeth are extracted for ritual or pseudomedical reasons [6].

Rites of passage accompany the transformation and progression from one developmental phase to another. Scarification in or after puberty, as an enduring contrast to younger individuals, emphasises initiation and grants admittance to the adult tribal community. Some authors include genital mutilation, both male and female, into this group to allow integration into a community and gain permanent visible and irrevocable membership [11, 14]. Other rites of passage may be associated with the first childbirth, the first and successive killing of humans,

be it enemies or for ritual grounds, or successful hunting. Scarification may be a sign of dignity and social status.

The theory of a non-adaptive sexually selected character explains scarification in the context of mating and sexual preferences and is based on the Darwinian theory of sexual selection. Scarifications are aesthetic adornments and intended to stimulate and attract potential sexual partners and to, in principle, allow for polygyny. For instance, among the Tiv ethnolinguistic group in Nigeria and Cameroon, raised keloids have been described to induce strong erotic feelings when touched, both among women and men [15].

The theory of an adaptive pathogen-driven sexually selected character is based on the Hamilton–Zuk hypothesis, according to which individuals choose sexual partners by variable characteristics which signal and reflect heritable resistance against infectious pathogens, in particular against parasites [16]. Scarification is believed to indicate resistance to pathogens and to demonstrate attractiveness and, thus, a superior value, together with health, of potential sexual partners. This hypothesis is, among others, one postulation of mating options and behaviour, and it supports the Darwinian ‘good genes’ theory. While selection of identical characteristics would reduce variation over time, the hypothesis provides one explanation of why variation may be maintained through rapid co-adaptational cycles between host and parasites over generations. Experimental data of animal models support the Hamilton–Zuk hypothesis [17, 18].

Although these theories are well suited to explain many aspects of scarification, not all forms and types of scarification can clearly be assigned to one of these hypotheses. Other reasons exist, such as purely aesthetic or medical explanations, religious justifications and social motives. Further body modifications are prayer bumps as found among devout Muslims, and cheek gashes developing into a typical scar, acquired in duels among homosocial members of collegiate unions. The latter ones could be traditionally found among academic circles in several parts of Europe, for example in Germany and Austria, but have become rare and are considered anachronistic.

Procedure of scarification

The procedure of scarification shall be illustrated by the example of the ritual scarification of a Surma woman in the territory of the Omo Delta in south-western Ethiopia (RG, own observation): without prior marking or painting of the intended scarification area, a small part of the skin to be treated is upraised by a wooden hook or an edged thorn to subsequently be sliced or removed with a razor blade. This is performed repeatedly for hours,

regardless of continuous bleeding, to achieve a pattern of lesions which later will form the adornment (Figure 2). Coagulated blood is occasionally removed with unsterile water, and the lesions are impregnated with ash and mud. Wound healing is purposely retarded by inserting unsterile materials, among others crocodile dung, into the lesions and by repeated removal of scabs; in fact, inflammatory processes are intended to occur and favour keloid formation for an extended period of time. While keloids develop in 10% to 36% of scarified individuals only [10, 19], formation of keloids is strongly desired, as they are aesthetic assets, emphasise femininity and increase social prestige [20].

Examples of scarification

Fishbone patterns, avian designs and the imitation of crocodile bites or crocodile skin are motifs that can be observed in several ethnic groups. These motifs shall frequently indicate closeness to or even identity with ancestor initiation animals. The Nigerian Bali and the Tanzanian Bondei and Shambaa groups perceive their scars as manifestations of their mythological ancestor bird, conferring reincarnation. Crocodile-associated scarification patterns can, for instance, be found in South Sudan among the Moru, the Tofinu in southern Benin, the Bobo in Burkina Faso, and the Montol, Merniang and Dimmuk in Nigeria [21]. Similar skin ornaments are also common in New Guinea among some ethnic groups of the Sepik area [22]. Scars may be indicative of secret society membership, which aims at shaping the body to perfection through ritual scars [8].

In several parts of East Africa, 'slayer' scars were common. Successful hunting or even killing an enemy allowed the fortunate huntsman to decorate himself with keloidal scars on the forehead, cheeks, shoulders and upper arms [21]. If dermal space had become scarce, skin surfaces of his wife(s) or his favourite livestock were ornamented. Typical for Bantu Tonga tribes in Zambia, Malawi and Zimbabwe was a long keloid scar reaching from one eyebrow to the other in order to achieve the appearance of a buffalo and to demonstrate resolute acerbity and decisiveness [21]. The belief is that blessed hunters will experience a beneficial spiritual transformation and reincarnation, and slayer scars symbolise achievements on the way to reach that aim. In some Kenyan and Tanzanian Maasai communities, circular and semicircular slayer scars on the cheeks may be observed. Even young boys are decorated with circular brandings as a tribal identification marker and as a sign of the desire to become a brave man in the future (Figure 3).

Tribal scars are frequent and may be observed in many ethnic groups. In South Sudan, the Dinka and the Nuer as well as some other Nilotic groups are marked with tribal-specific scars on the foreheads. While the Nuer have horizontal scars, those of the Dinka are serrated and fan-shaped (Figure 4). Thus, in the ongoing civil war in South Sudan, members of the conflicting ethnic groups and clanships are easily recognisable. Although now forbidden in parts of South Sudan, tradition still dictates scarification.

Some East African tribes used hoof-shaped or angled motifs, similar to cattle brandings. Impressive adornment are the tribal marks of the Schilluk and Toposa groups in South Sudan. A pearl necklace of punctuated round keloidal scars reaches from one ear to the other, forming a semicircle around the eyebrows. Similarly, Barabaig women in Tanzania wear dotted scars surrounding the entire orbital region to signal female perfection. Comparable scars, in addition partly covering the cheeks, are found among Bumi men in Ethiopia [23]. Some prestigious Fulani women show four-three-lane keloid chains in their faces to indicate their social rank [24]. In fact, the ornaments may serve in these tribes as identity cards, indicating age, puberty, marital status, social status and merits, and they are perceived as signs of attractiveness [25].

Members of the Yoruba in Nigeria have typical face scars, called *kolo*. *Kolo* ornamentation is intended to express audacity, perseverance and resolution, but also feelings (e.g. mourning, grief, sorrow), religious beliefs, and animal and plant symbols. During scarification, the wounds are treated with grime and powdered coal to achieve a darker appearance of the scar pattern [15]. Tribal scarification is frequently found in northern Ghana among members of the Mamprusi, Nanumba, Gonja, Frafra, Dagomba and other ethnic groups. The meaning of the scars has been described in detail for Ghana [26, 27] and Burkina Faso [28].

Medical reasons for and unfavourable consequences of scarification

Scarification is also performed to find relief from distinct medical conditions and to improve physiological functionality. Punctual branding can be applied for cleansing and disinfection of locally infected lesions or to distract from a source of severe pain, such as toothache and cephalgia and other neuropathies. Febrile convulsions and epilepsy may be treated by branding or cutting the skin [10]. In Togo, scarification for epilepsy treatment is mostly applied on the forehead, clearly identifying individuals scarred in such a way as epileptics [29]. Among



Figure 1 Face masks of the Chokwe ethnic group, Angola, with tribal-specific symbols indicating social ranks (photograph: R. Garve, own ethnographic collection).

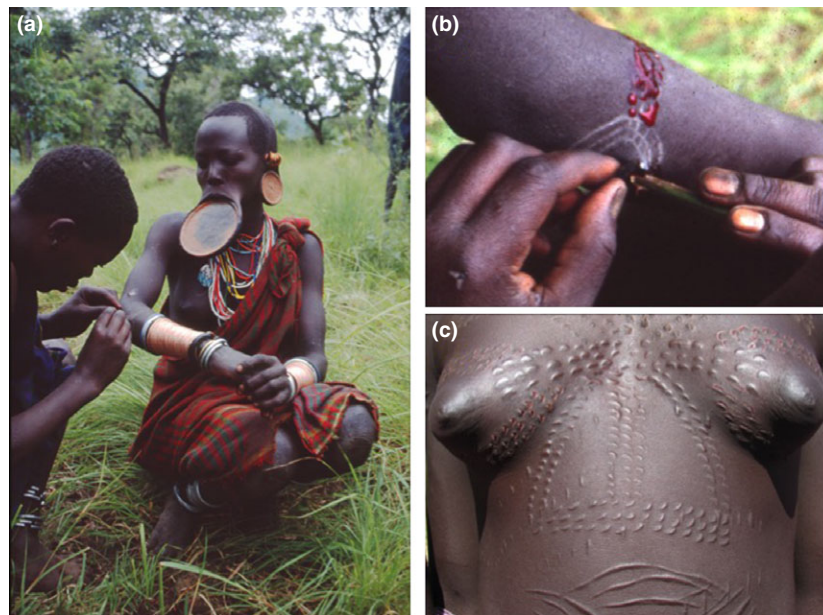


Figure 2 (a, b) Scarification of a Surma woman in Ethiopia. Note the upper lip labret and ear adornment shown in Fig. 3A (see Ref. [7]) (photograph: M. Garve, 2001); (c) Toposa woman in South Sudan (photograph: W. Moritz, 2012).

the Sudanese Nuba, deep temporal cuts are applied to treat headache, while supraorbital scars are administered to improve vision [23]. Ritual scarification of adults,

young children and babies in some Congolese groups has served explicitly prophylactic and therapeutic purposes [11]. Prevention of diseases through scarification is also



Figure 3 (a) Ghanaian woman, tribal marks (photograph: C.G. Meyer, 2016); (b) Toposa woman in South Sudan, shoulder scarring (photograph: W. Moritz, 2012); (c) Maasai boy in Kenya (photograph: R. Garve, 2016); (d) Toposa woman, South Sudan (photograph: W. Moritz, 2012); (e) male Maasai in Kenya with scars indicating courageousness (photograph: R. Garve, 1985); (f) Toposa woman in South Sudan (photograph: W. Moritz, 2012).



Figure 4 (a) Male Nuer in South Sudan; typical horizontal forehead scars (photograph: W. Moritz, 2012); (b) female Nuer, South Sudan; fan-shaped forehead scarification (photograph: W. Moritz, 2012); (c) Surma boy in Ethiopia, parable-shaped forehead scars (photograph: R. Garve, 2015); (d) Surma girl in Ethiopia, recently applied punctual scarification (photograph: R. Garve, 2015).

sought frequently in South Africa [30, 31]. In a study from Congo, frequent indications for curative scarifications were ‘big belly’, ponderal stagnation and recurrent bronchitis [32]. Scarification may also be performed to apply traditional remedies, mostly substances of unknown composition [30], and to treat splenic enlargement in childhood malaria as observed in Nigeria [33]. It is worth mentioning that there is no proven evidence of causal relationships between scarification and the therapeutic success of any disorder. However, psychological and placebo effects are likely.

Several non-communicable and infectious conditions may result from scarification. Scarification is associated with both local dermal hypertrophy and atrophy [10, 19, 34] and with cutaneous sarcoidosis [35, 36]. In Ghana, scarification is a risk factor for rapid progression of filarial elephantiasis caused by *Wuchereria bancrofti* [37]. As in traditional communities, scarifications are mostly performed with unsterile instruments, and unsterile materials are applied and rubbed into the wounds to extend the healing process, infections are likely to occur, both locally and systemically. Causative agents of local bacterial infections include a variety of agents and sepsis arising as a complication from locally infected scarification lesions and pneumonia occurs [32]. A considerable incidence of tetanus has been found associated with traditional practices, for example in Cameroon [38] and in Senegal, where 3.6% of all tetanus cases between 1982 and 1990 occurred in pierced, circumcised, tattooed and scarified individuals [39].

Systemic pathogens acquired through scarification with infected tools include hepatitis viruses (HBV, HCV) and HIV. Although incontestable studies exclusively attributing the acquisition of these agents through scarification are hardly available, some associations have been observed. The repeated use of unsterile instruments for scarification has consistently been claimed to be a reason for HIV, HBV and HCV transmission [40–55], and scarification has been observed to be a significant risk factor for HBV-related hepatocellular carcinoma [56].

As the risk of the transmission of infectious diseases is obvious when using unsterile tools for scarifications, we feel that further studies assessing associations of communicable diseases with use of these instruments are not required, but raising awareness by addressing potential complications conferred through contaminated tools is highly important. Notably, several studies reported scarification to be practiced predominantly among people of lower socio-economic status [32, 50], and, as documented in a small questionnaire-based study, only 10.5% of individuals with scarification would accept scarification or tribal marks if offered again [10].

Scarification is a cultural custom in many indigenous societies in sub-Saharan Africa. We plead for access to hygienic instruments to apply scars under sterile conditions in those communities who wish to do so, under the premise that informed assent is provided by those who are subjected to the procedure. Children must be excluded.

Ethical statement

The authors declare no conflict of interest. All individuals shown in the figures provided consent to take their pictures and agreed that their photographs might be published in a scientific journal.

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Corresponding Author Christian G. Meyer, Institute for Tropical Medicine, Eberhard Karls University, Tübingen, Germany.
E-mail: christian.g.meyer@gmail.com