

# Ornament induced complications in snake bites: Revisiting the “Do it RIGHT” approach

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### ABSTRACT

Limb adorning ornaments (LAO) can exacerbate the local effects of envenoming in case of venomous snake bite. Cultural presuppositions do inhibit victims from removing symbolically/ritually important jewelry even under circumstances that might increase the dangers of envenoming-induced gangrene formation. The recommendation to remove the LAO is usually skipped in guidelines and if at all included the very real hazard is uncommonly documented. We observed 14 cases of snake bite with LAO on the bitten limb with minimal to severe local complications. The possible reasons were discussed with recommendations of proper and timely methods of removal of these ornaments. We suggest inclusion of this concept of ‘Remove’ in the recommended first aid methods of the guidelines/protocols.

**Keywords:** First aid, gangrene, ornaments, protocol, snake bite

### Introduction

Globally the total incidence of envenoming is as high as 1,841,000 resulting in 94,000 deaths.<sup>[1]</sup> India has a high share of this estimated burden of annual envenoming of 81,000 and deaths 11,000.<sup>[2]</sup> An Indian study suggested a gross underestimation of snake bite-related deaths in India, which could be three times higher than that of WHO estimation.<sup>[3]</sup>

To address this important neglected tropical disease WHO had formulated guidelines for South-East Asia.<sup>[4,5]</sup> In this lieu, India also made its own national protocol which simplified the “first aid” by a mnemonic “Do it RIGHT”<sup>[6]</sup> (R - reassurance, I - immobilization, GH - get to the hospital, T - tell the doctor the symptoms).

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We observed the presence of various limb adorning ornaments (LAOs) on victims who are under treatment and found that the possibility of complications increased with these bands like ornaments over the bitten extremity.

### Case Report

We studied 14 hospitalized cases of snake bite, 13 of which were married Hindu women and one Hindu male. LAO were found to be present on the bitten limbs of all the under treatment victims. On 13 out of 14 occasions the snake was identified as common cobra (*Naja naja*) and on single occasion [Figure 1f]. It was Russell’s viper (*Daboia russelii*). The snakes were positively identified by the victims and their relatives with minimum chance of error as these snakes are very common in this geographic region. On six occasions, the dead snakes were brought to the hospital and identified. In all these cases the affected limb had shown a variable degree of complications

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**Figure 1:** Limb adorning ornaments on the bitten limb (photograph by Subhendu Mallik)

ranging from swelling, early necrotic changes to frank gangrene formation. In three cases, the LAO were tightened due to swelling [Figure 1a, b, j and m]. These patients had invariably complained about pain at the point of constriction due to LAO. In four cases patients were though initially reluctant but removed the LAO after counselling [Figures 1c, e, h and i]. In three cases, metal cutter was used to remove the LAO [Figure 1d, g and j]. In rest of the cases where the LAO are loose, we persuaded and removed them without disturbing the tight tourniquet where present [Figure 1j-l, n, o and p]. The tourniquets were removed after administration of an initial dose of ASV and with resuscitative backup.

Thirteen of the fourteen patients were female, who were initially very reluctant to remove the LAO, as they were all married Hindus. In the Hindu culture, red bangles and toe rings are symbols of the married status of women and are never removed completely. These LAO are worn for a lifetime and are retained during funerary rites (including cremation), or until the wearer is widowed.

The lone male victim [Figure 1l] readily removed the LAO without any reluctance.

## Discussion

Use of various LAO like bangles and other articles of cultural and religious significance like sacred threads is common in women and men in India. Uses of LAO are also observed in many populations and places across the globe.

The nonremoval of various LAO in patients of snake bites could be due to:

- Strong reluctance of married female patients to remove these ornaments
- Lack of knowledge to foresee the complication associated with these
- The absence of any mention for the removal of LAO in the recommended first aid methods of WHO SEARO Guidelines and National protocols
- Lack of published evidence about deleterious effects of LAO in peer-reviewed journals.

The compliance of patients for removal of these LAO will surely be better if counseled by a known family physician, who is often the first person of contact.

Local swelling is a known early feature of most venomous bites and is severe in viperine envenoming with the exception of Kraits (*Bungarus spp.*). We observed that all such LAO if not removed in time can be tightened due to swelling and the patient suffers from distressing pain at the site of tightened LAO. Moreover, when swelling occurs it becomes difficult to remove the LAO and at times may necessitate a metal cutter to cut the metallic ones. Importantly, if a patient with LAO is brought with profuse swelling toward the distal part, then the ornaments might be acting as tourniquets. In such situations it should be handled like that of a tight arterial tourniquet and should not be disturbed until the patient is in the hospital, resuscitation facility is available, and antivenom treatment is started.<sup>14-7</sup>

Application of tight arterial tourniquet is highly condemned because of its harmful effects such as ischemia, necrosis, embolism, and increased risk of the sudden neurotoxic blockade

on release.<sup>[4-7]</sup> These complications are also expected in the case of a tightened LAO acting as a virtual tourniquet. If early intervention is instituted, even as simple as removing LAO, it may go a long way in preventing secondary and tertiary complications. However, application of a tight tourniquet is still rampant in practice which needs a spread of awareness at community level regarding the deleterious effects of a tourniquet.

The recommended first aid methods of WHO SEARO guidelines (1999, 2010) and Indian protocol (2007, 2009) are silent about the associated complication of LAO and actions required thereof. Though in Indian protocol (2009) there is a mention to remove the jewelry, it is under the heading of “creating awareness among the community about do’s and don’ts.”<sup>[7]</sup> We feel that it would have been befitting if it was mentioned in the first step of the recommended first aid methods of the protocol. Our observation on LAO, its complications, and benefits of early removal could be a potential resource for those revising the WHO “Do it RIGHT” approach any time in the future.

The removal of jewelries from the affected limbs is appropriately mentioned in some of the recommended first aid methods like guidelines for Africa prepared by WHO.<sup>[8]</sup> However the real hazard and complications arising due to these ornaments in venomous snake bite is not emphasized with evidence.

## Conclusion

From our observation of cases and review of literature, we suggest that the concept of removal of the LAO should be included in the first step of recommended first aid methods of all protocols for a better patient outcome. The “Do it RIGHT” mnemonic for the first aid methods, adopted by India should be reframed with the addition of the concept of remove. The “R” of the “R.I.G.H.T.” which stands for “reassure” only, should also mean for “remove”; R = reassure and remove (Reassure the patient. Remove the ornaments and other constricting materials present on the bitten limb).

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## Conflicts of interest

There are no conflicts of interest.

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