

## Extended Debridement and Skin Graft as Local Treatment of Cobra Snake Bite Injury: A Case Report.

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*Snakebite is a serious issue in rural areas of developing countries as Uganda. In children above all snakebite seems to be more common. Availability of anti-venoms is very poor. Local tissue damage caused by snake venom, either cytotoxic or necrotic, can continue even after systemic crisis has expired. We report the case of a 5 years old male child, born in Kitgum district, Northern Uganda, carried in hospital for a Cobra snake bite on the right foot who could not receive anti-venom. Debridement of the bite site, wound lavage, amputation and skin graft were required. Progression of the local infection associated to the reappearance of high fever induced us to bring the debridement up to the leg almost at the level of the knee in order to prevent onset of tibial Osteomyelitis and to be able to perform skin grafting.*

**Keywords;** Snakebite, Cobra, surgical treatment, debridement, skin graft, osteomyelitis.

### Introduction

Snakebite is a serious issue in rural areas of developing countries. In children above all snakebite seems to be more common<sup>1</sup>. In Northern Uganda referrals to Health Centers or Outpatients department for such events are weekly reported. Because of the distances patients have to cover in order to reach hospitals and because of the still common first step referral to traditional doctors, many cases of snakebite die before practitioners can start any treatment. Anti-venoms are unfortunately not widely available in Uganda<sup>1,2,3</sup>. Patient who are admitted to hospital are mostly those who survived the systemic problems venom causes. It is particularly the local injury that brings patients in fact to hospital. Local tissue damage caused by snake venom, either cytotoxic or necrotic, can continue even after systemic crisis has expired<sup>4</sup>. Tissue necrosis and local infection often times need surgical management to be solved<sup>5</sup>. Debridement of the bite site, wound lavage, amputation and skin graft are some of the procedures snake bite treatment require<sup>5</sup>. Osteomyelitis is a severe complication observed in the experience of our Hospital. Preventing it is a concern surgeon has when.

We report the case of a 5 years old male child, born in Kitgum district, Northern Uganda, carried in hospital for a Cobra snake bite on the right foot happened early in the morning during the rainy season. Systemic and local treatment was required. Delayed necrosis and the fear for the onset of osteomyelitis requested extension of the debridement.

### Case Report

A 5 years old boy weighing 19 kg, was brought by the parents to the Outpatients Department of Saint Joseph Hospital, Kitgum District, in Northern Uganda. The child had been referred with a history of sudden pain in the right foot while he was sleeping in his hut. Intense pain, swelling and edema of the foot started immediately followed by high fever, weakness and loss of consciousness. Two other people had also been attacked by a snake and one died. Witnesses described with a certain amount of certainty that the snake was a Cobra.

On admission his blood pressure was 90/60. Other findings included a temperature of 38.5°C, heart rate 122 bpm and respiratory rate of 125. The right leg was warm, swollen with signs of oedema and

swelling. Features of inflammation and bacterial infection were present together with cutaneous necrosis involving the whole surface of the foot.

Since in our Hospital no anti-venom was available, the medical treatment we could provide to this case included intra-venous administration of crystalloids, hydrocortisone and ceftriaxone antibiotics. After 48 hours from time of admission, systemic parameters were stabilized and landmarks of the initial necrosis of the tissues of the foot became evident.

A decision was taken to perform surgical debridement. Under general anesthesia we drained 250 ml of pus from the soft tissues of the foot and right leg. A total of 20% of the skin of the foot which was necrotic was removed. Toes were temporary left in place even though there were early features of necrosis. Debridement and lavage were done every 48 hours initially until extension of necrosis was definitely evaluated. Warm saline plus Iodopovidone 5% were used to wash the wound; Hydrogen peroxide solution was used to clean the tissue before performing amputation. Amputation of the toes first and afterward of the first metatarsus was required. Later when early contracture of the Achilles tendon was noted we applied an open cast to keep the right foot extended. No bacterial examination from a wound sample was done due to insufficient means.

After we noticed a progression of the local infection associated to the reappearance of high fever, in order to prevent onset of tibial osteomyelitis we decided to bring the debridement up to the leg almost to the level of the knee. Several lavages were performed with pus and necrotic tissue evacuation from the distal third of the leg. Total cleaning of the region was achieved. After 19 lavages, tibial bone was not presenting signs of infection and soft tissues of the leg were granulating properly. After 1 week from total resolution of the infective process we performed skin graft. We divided the grafting in three steps. Grafts were taken from the thighs and applied to the granulating tissue. Very few stitches were used to keep the grafts in place. The skin took well. Patient kept cast in place also after discharge and was referred to an orthopedic workshop for customized shoes for the amputated foot.

On discharge patient was not presenting signs of residual infection or necrosis. White cell count was within normality rates. Right foot was warm and clean with good skin graft implant.

## Discussion

Mortality associated to poisoned snake bite in Northern Uganda is difficult to be quantified. Nevertheless in our institution we weekly reported referrals for such an event. Survived patient often referred to have received second or third bite from a snake attack on more than one person. It's reasonable to think that poison load is lower after the first bite. In our experience it was rare to hear of a survived patient from a single person Cobra snake attack, above all among children. As other authors report, snake bite occurred in the case we describe, happened within the shelter of a house while the child was sleeping, during the rainy season<sup>1</sup>. Other two children were involved in the attack. At patient's arrival surgeon's behavior is crucial. Bite site evaluation is the starting point together with stabilization of systemic parameters. Absence of anti-venom and the lack of supply is an issue we have to daily deal with. Crystalloid fluid load and i.v. cortisone are indicated in our experience. We usually associate also antibiotic therapy and tetanus prophylaxis<sup>6,7</sup> when disposable. If there's no evidence of compartment syndrome<sup>8</sup>, debridement should be delayed until pus is present below the external tissues and the edges of the necrotic area are at least initially delimited<sup>9</sup>. In Northern Uganda anti-venom is not available so patients have to recover from hematologic and neurologic toxicity basically by themselves. After the first pus evacuation and necrotic tissue debridement chances to develop delayed necrosis are still high<sup>10</sup>. Observation and repeated medication are needed to enquire whether or not starting necrotic processes are developing also far from the initial site<sup>11</sup>.

Another main concern to have is osteomyelitis onset. The poor hygienic conditions people live in and the lack of immediate primary wound disinfection are a risk factor for developing septic bone

processes. Since consequences of such an onset over a poisoned site can be extremely severe, surgical follow up of the debrided wound is mandatory<sup>12,13</sup>. In the case we report decision for a pushed extension of the debridement came after temperature re-increased even when in our opinion the surgical site was clean<sup>14</sup>. Detecting any possible focus of tibial osteomyelitis or residual necrotic tissue far from the infection starting site became then necessary. This aspect is crucial even in order to perform a safe skin graft. Complete resolution of the infection also distally from the grafted site occurs to achieve a good graft acceptance. Necrosis of soft tissues of the foot can bring to tendons injury. Retraction of the Achilles tendon, if not corrected can cause additional functional problems. We fashion an open cast meant to extend Achilles tendon in order to recover an acceptable extension of the foot. Physiotherapy should be proposed where possible to restore the strength of the remnant muscular mass.

## Conclusion

Cobra snake bite is a life threatening event unfortunately common in Northern Uganda. Systemic toxicity can be difficult to treat where anti-venom is not available. The treatment of snake bite site necrosis and infection is challenging and long lasting but it is mandatory for saving patient functional outcome. Delayed extensive use of debridement can be required to prevent the onset of osteomyelitis.

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