EAST AFRICAN SNAKEBITE SYMPOSIUM

19th June

Response-Med
REMOTE MEDICAL SUPPORT

amref health africa

EMERGENCY
MEDICINE KENYA FOUNDATION

GSI GLOBAL SNAKEBITE INITIATIVE

CASE REPORTS ON SYNDROMIC MANAGEMENT OF SNAKEBITES

DR EUGENE ERULU
WATAMU HOSPITAL

PPS PRESENTATION

Name: CWM

Age: 26

Gender: F

Date andTime of the bite:
06/11/2022,16:00 Hrs

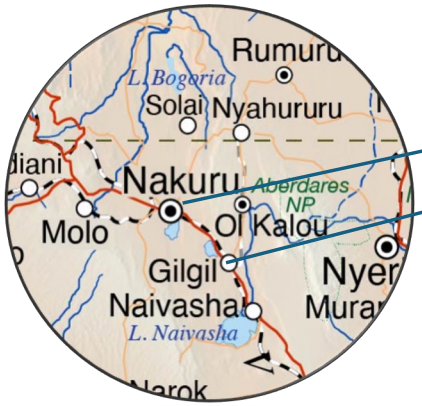
Location: Gilgil, Kenya

Circumstances of the Bite:
Collecting firewood

Complaints: Pain at the bite site,

PPS PRESENTATION

16:00
Call from Gilgil, Nakuru County

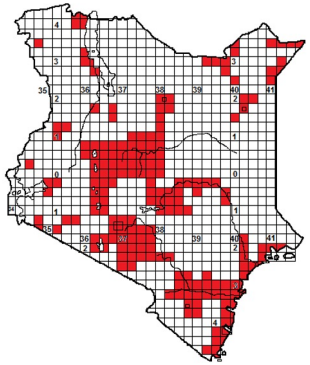


Puff adder (B. arietans)

70 cm to 1.1. m

Colour variable (grey, brown, yellowish) with a series of V-shapes, light and dark, along the back, pointing towards the tail

Occurs virtually throughout Kenya Known from within or in the vicinity of almost every town in Kenya, including Nairobi, Mombasa, Eldoret, Nakuru, Malindi, Kisumu etc.



PPS PRESENTATION

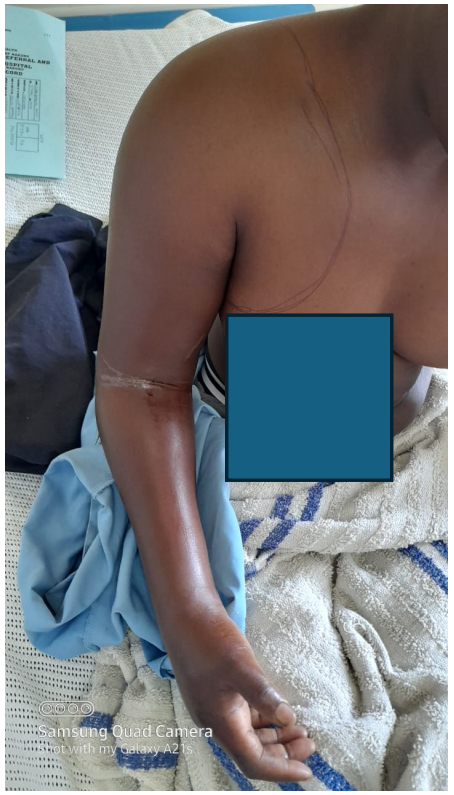
- 2 Hours post-envenomation
- Swelling past 2 major joints
- No antivenom available at Gilgil
- Patient referred to Nakuru County Referral Hospital,45km away by public transport
- Contacted KIPRE who dispatched AV to Nakuru

PPS PRESENTATION

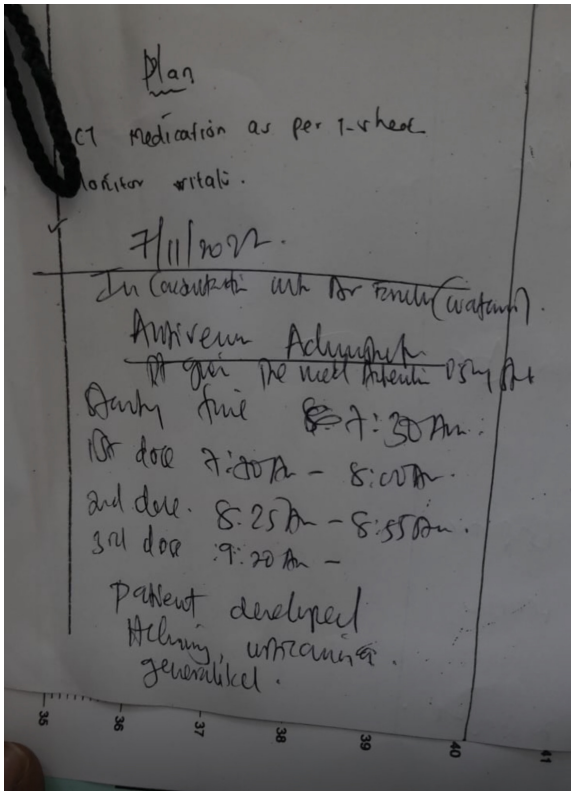
21:30 – Arrival at the Nakuru County referral Hospital, 5 ½ Hours Post Bite. Swelling approaching the shoulder.
20min WBCT – clotted.
Antivenom delivered but not started

PPS PRESENTATION

16 Hrs Post envenomation

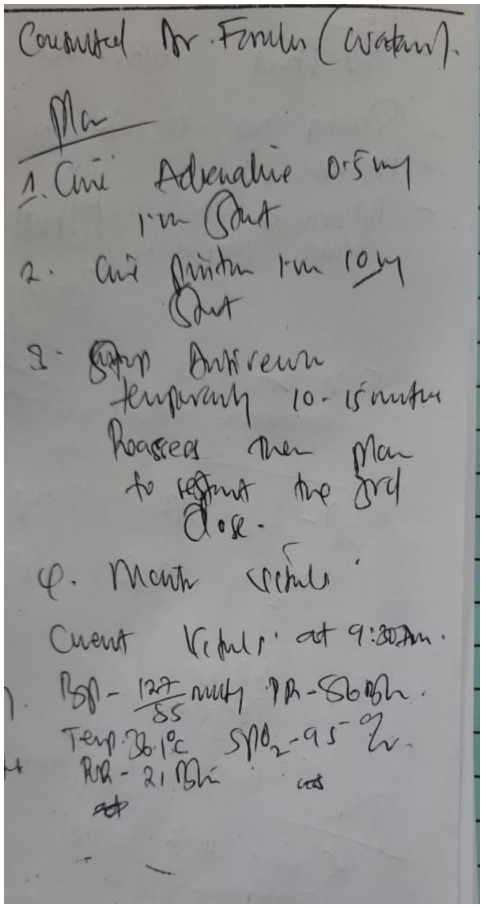


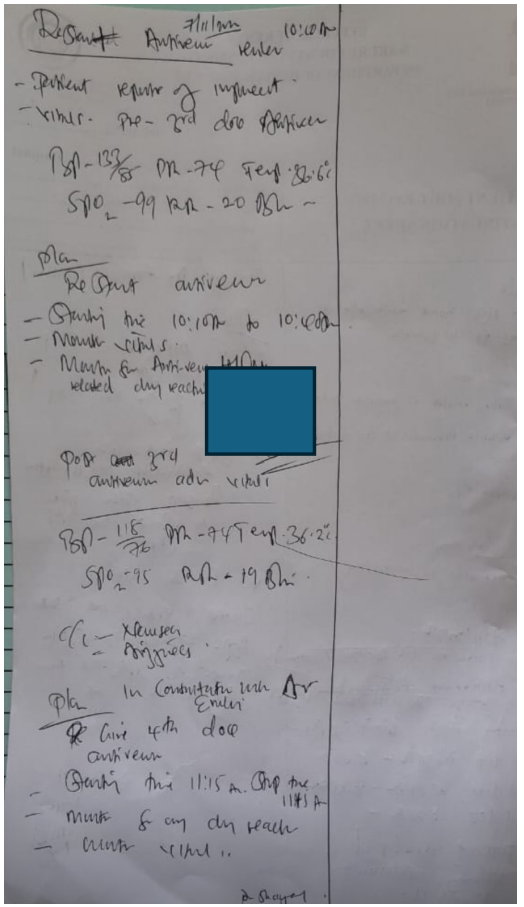
AV ADMINISTRATION



ADVERSE REACTION TO ANTIVENOM

PPS PRESENTATION



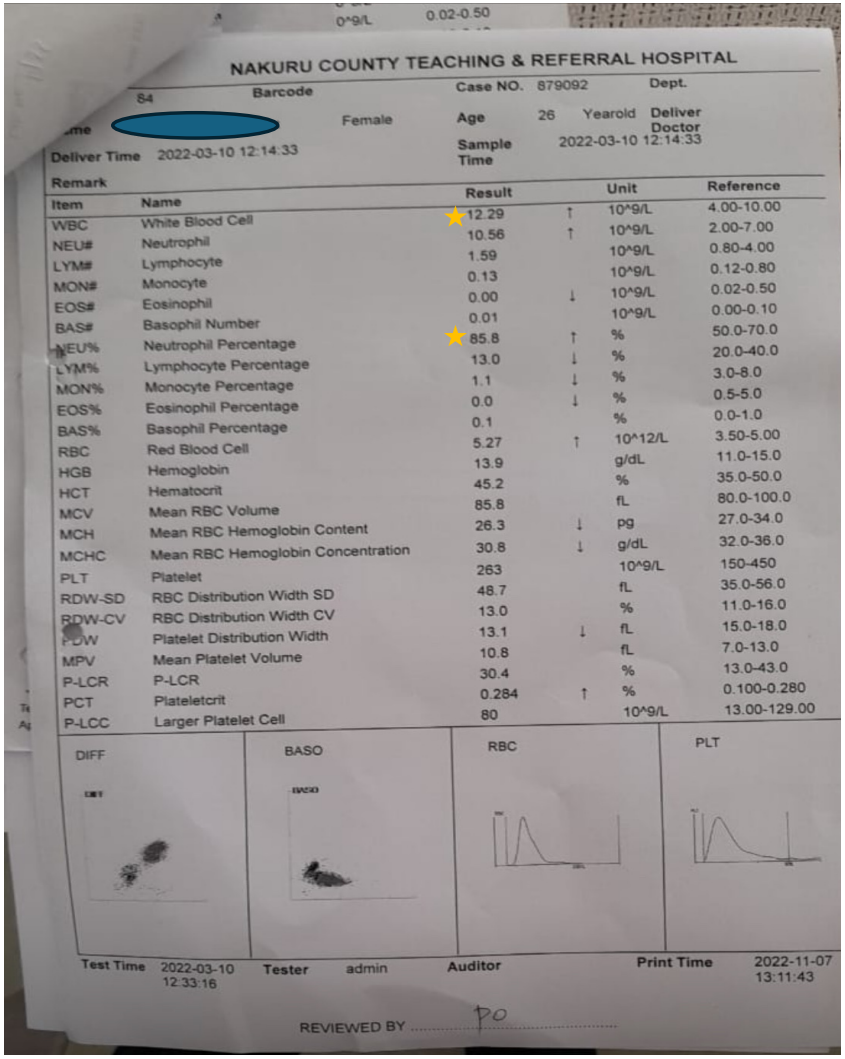


DAY 4


Samsung Quad Camera


Samsung Quad Camera
Shot with my Galaxy A21s

BLOOD TEST RESULTS DAY 2 POST ENVENOMATION



NAKURU COUNTY TEACHING & REFERRAL HOSPITAL

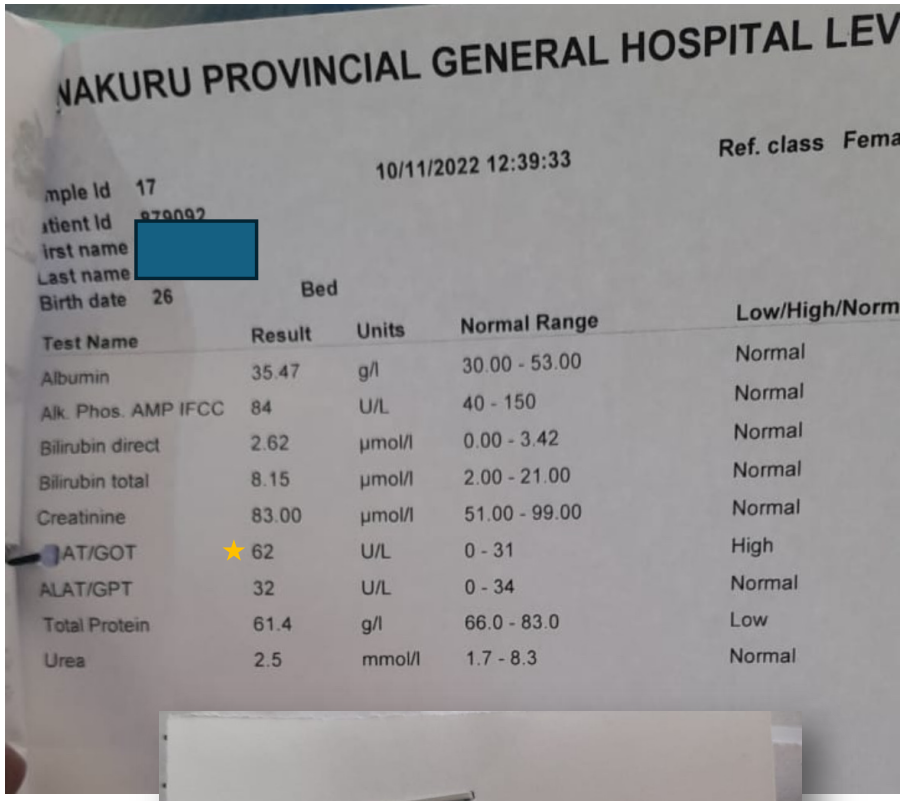
Barcode 84 | Case NO. 879092 | Dept.
Name [redacted] | Female | Age 26 Yearold | Deliver Doctor
Deliver Time 2022-03-10 12:14:33 | Sample Time 2022-03-10 12:14:33
Remark

Item	Name	Result		Unit	Reference
WBC	White Blood Cell	★12.29	↑	10^9/L	4.00-10.00
NEU#	Neutrophil	10.56	↑	10^9/L	2.00-7.00
LYM#	Lymphocyte	1.59		10^9/L	0.80-4.00
MON#	Monocyte	0.13		10^9/L	0.12-0.80
EOS#	Eosinophil	0.00	↓	10^9/L	0.02-0.50
BAS#	Basophil Number	0.01		10^9/L	0.00-0.10
NEU%	Neutrophil Percentage	★85.8	↑	%	50.0-70.0
LYM%	Lymphocyte Percentage	13.0	↓	%	20.0-40.0
MON%	Monocyte Percentage	1.1	↓	%	3.0-8.0
EOS%	Eosinophil Percentage	0.0	↓	%	0.5-5.0
BAS%	Basophil Percentage	0.1		%	0.0-1.0
RBC	Red Blood Cell	5.27	↑	10^12/L	3.50-5.00
HGB	Hemoglobin	13.9		g/dL	11.0-15.0
HCT	Hematocrit	45.2		%	35.0-50.0
MCV	Mean RBC Volume	85.8		fL	80.0-100.0
MCH	Mean RBC Hemoglobin Content	26.3	↓	pg	27.0-34.0
MCHC	Mean RBC Hemoglobin Concentration	30.8	↓	g/dL	32.0-36.0
PLT	Platelet	263		10^9/L	150-450
RDW-SD	RBC Distribution Width SD	48.7		fL	35.0-56.0
RDW-CV	RBC Distribution Width CV	13.0		%	11.0-16.0
PDW	Platelet Distribution Width	13.1	↓	fL	15.0-18.0
MPV	Mean Platelet Volume	10.8		fL	7.0-13.0
P-LCR	P-LCR	30.4		%	13.0-43.0
PCT	Plateletcrit	0.284	↑	%	0.100-0.280
P-LCC	Larger Platelet Cell	80		10^9/L	13.00-129.00

DIFF | BASO | RBC | PLT

Test Time 2022-03-10 12:33:16 | Tester admin | Auditor | Print Time 2022-11-07 13:11:43

REVIEWED BY ..... PO

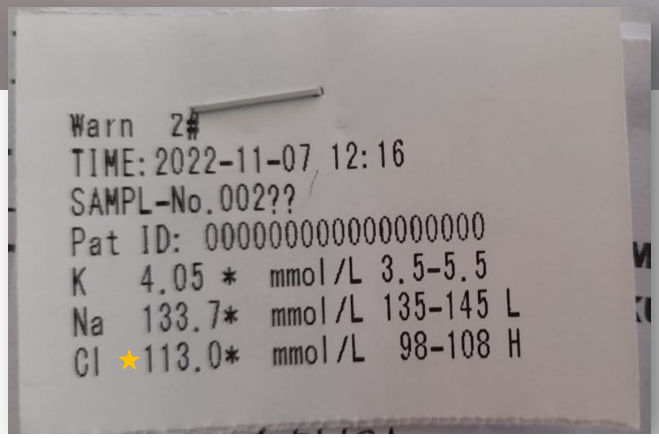


NAKURU PROVINCIAL GENERAL HOSPITAL LEV

10/11/2022 12:39:33 | Ref. class Fema

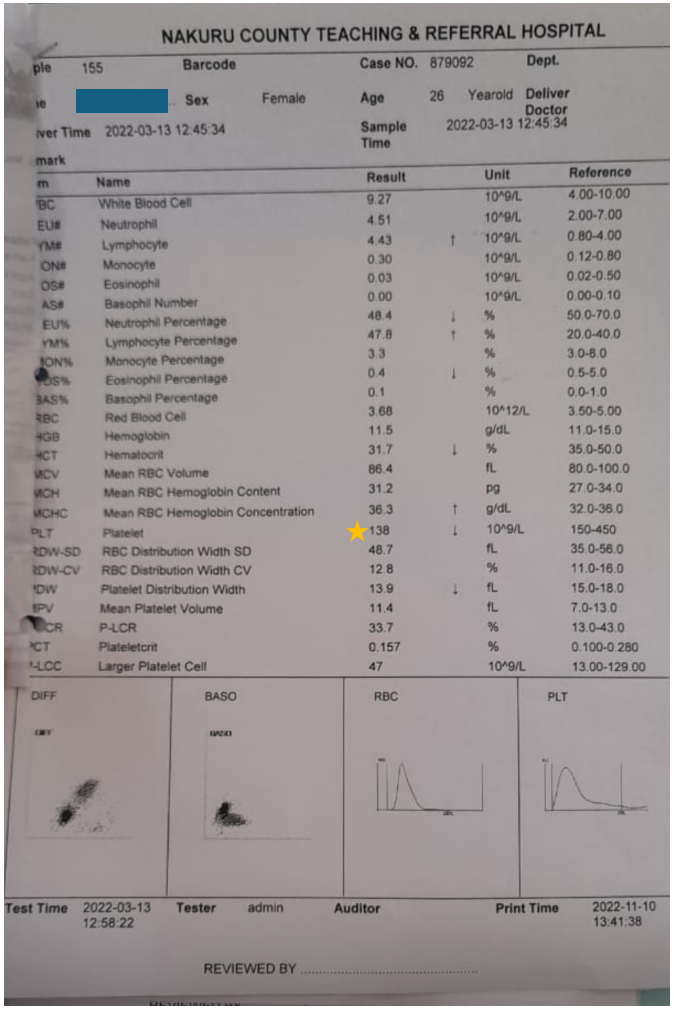
mple Id 17
tient Id 879092
irst name [redacted]
Last name
Birth date 26 | Bed

Test Name	Result	Units	Normal Range	Low/High/Norm
Albumin	35.47	g/l	30.00 - 53.00	Normal
Alk. Phos. AMP IFCC	84	U/L	40 - 150	Normal
Bilirubin direct	2.62	µmol/l	0.00 - 3.42	Normal
Bilirubin total	8.15	µmol/l	2.00 - 21.00	Normal
Creatinine	83.00	µmol/l	51.00 - 99.00	Normal
AT/GOT	★62	U/L	0 - 31	High
ALAT/GPT	32	U/L	0 - 34	Normal
Total Protein	61.4	g/l	66.0 - 83.0	Low
Urea	2.5	mmol/l	1.7 - 8.3	Normal



Warn 2#
TIME:2022-11-07 12:16
SAMPL-No.002??
Pat ID: 00000000000000000
K 4.05 * mmol/L 3.5-5.5
Na 133.7* mmol/L 135-145 L
Cl ★113.0* mmol/L 98-108 H

BLOOD TEST RESULTS DAY 4 POST BITE



NAKURU COUNTY TEACHING & REFERRAL HOSPITAL

ple 155 Barcode Case NO. 879092 Dept.

[redacted] Sex Female Age 26 Yearold Deliver Doctor

iver Time 2022-03-13 12:45:34 Sample Time 2022-03-13 12:45:34

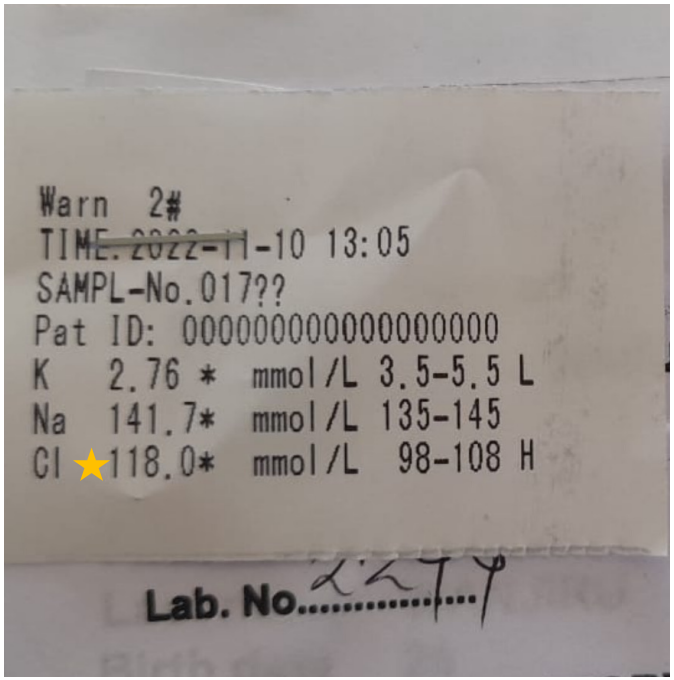
mark

m	Name	Result		Unit	Reference
BC	White Blood Cell	9.27		10^9/L	4.00-10.00
EU#	Neutrophil	4.51		10^9/L	2.00-7.00
YM#	Lymphocyte	4.43	↑	10^9/L	0.80-4.00
ON#	Monocyte	0.30		10^9/L	0.12-0.80
OS#	Eosinophil	0.03		10^9/L	0.02-0.50
AS#	Basophil Number	0.00		10^9/L	0.00-0.10
EU%	Neutrophil Percentage	48.4	↓	%	50.0-70.0
YM%	Lymphocyte Percentage	47.8	↑	%	20.0-40.0
ON%	Monocyte Percentage	3.3		%	3.0-8.0
OS%	Eosinophil Percentage	0.4	↓	%	0.5-5.0
AS%	Basophil Percentage	0.1		%	0.0-1.0
RBC	Red Blood Cell	3.68		10^12/L	3.50-5.00
HGB	Hemoglobin	11.5		g/dL	11.0-15.0
HCT	Hematocrit	31.7	↓	%	35.0-50.0
MCV	Mean RBC Volume	86.4		fL	80.0-100.0
MCH	Mean RBC Hemoglobin Content	31.2		pg	27.0-34.0
MCHC	Mean RBC Hemoglobin Concentration	36.3	↑	g/dL	32.0-36.0
PLT	Platelet	★138	↓	10^9/L	150-450
RDW-SD	RBC Distribution Width SD	48.7		fL	35.0-56.0
RDW-CV	RBC Distribution Width CV	12.8		%	11.0-16.0
PDW	Platelet Distribution Width	13.9	↓	fL	15.0-18.0
MPV	Mean Platelet Volume	11.4		fL	7.0-13.0
PCR	P-LCR	33.7		%	13.0-43.0
PCT	Plateletcrit	0.157		%	0.100-0.280
P-LCC	Larger Platelet Cell	47		10^9/L	13.00-129.00

DIFF BASO RBC PLT

Test Time 2022-03-13 12:58:22 Tester admin Auditor Print Time 2022-11-10 13:41:38

REVIEWED BY .....



Warn 2#

TIME.2022-11-10 13:05

SAMPL-No.017??

Pat ID: 00000000000000000

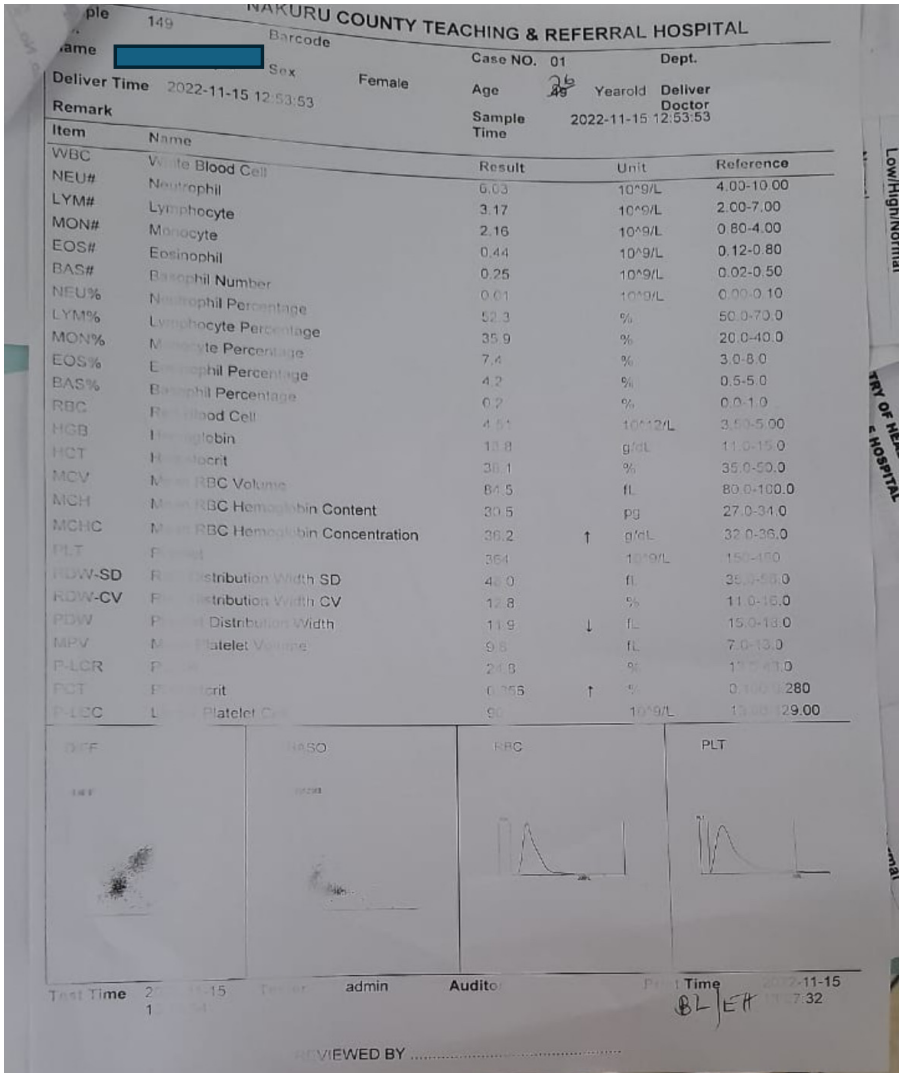
K 2.76 * mmol/L 3.5-5.5 L

Na 141.7* mmol/L 135-145

Cl ★118.0* mmol/L 98-108 H

Lab. No.....

BLOOD TEST RESULTS 9 DAYS POST BITE



NAKURU COUNTY TEACHING & REFERRAL HOSPITAL

149 Barcode

[redacted] Sex Female Case NO. 01 Dept.

Deliver Time 2022-11-15 12:53:53 Age 26 Yearold Deliver Doctor

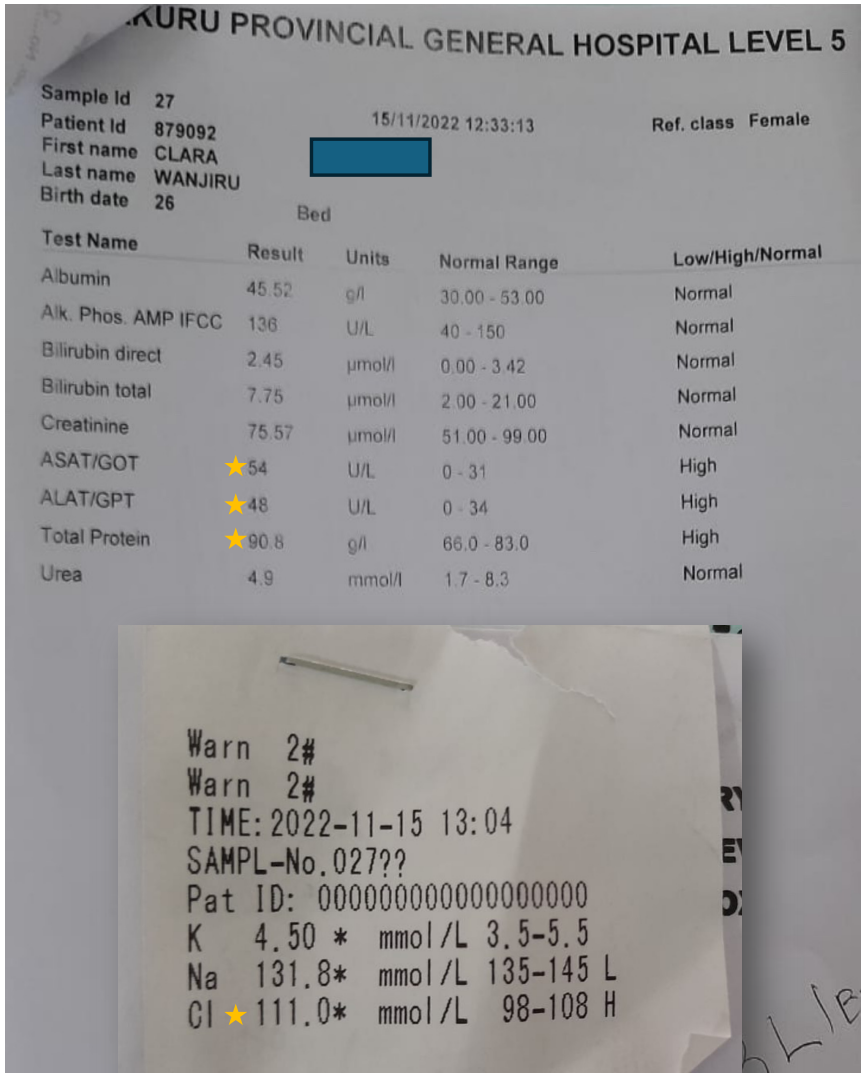
Remark Sample Time 2022-11-15 12:53:53

Item	Name	Result		Unit	Reference
WBC	White Blood Cell	6.03		10^9/L	4.00-10.00
NEU#	Neutrophil	3.17		10^9/L	2.00-7.00
LYM#	Lymphocyte	2.16		10^9/L	0.80-4.00
MON#	Monocyte	0.44		10^9/L	0.12-0.80
EOS#	Eosinophil	0.25		10^9/L	0.02-0.50
BAS#	Basophil Number	0.01		10^9/L	0.00-0.10
NEU%	Neutrophil Percentage	52.3		%	50.0-70.0
LYM%	Lymphocyte Percentage	35.9		%	20.0-40.0
MON%	Monocyte Percentage	7.4		%	3.0-8.0
EOS%	Eosinophil Percentage	4.2		%	0.5-5.0
BAS%	Basophil Percentage	0.2		%	0.0-1.0
RBC	Red Blood Cell	4.51		10^12/L	3.50-5.00
HGB	Hemoglobin	13.8		g/dL	11.0-15.0
HCT	Hematocrit	38.1		%	35.0-50.0
MCV	Mean RBC Volume	84.5		fL	80.0-100.0
MCH	Mean RBC Hemoglobin Content	30.5		pg	27.0-34.0
MCHC	Mean RBC Hemoglobin Concentration	36.2	↑	g/dL	32.0-36.0
PLT	Platelet	364		10^9/L	150-450
RDW-SD	Red Cell Distribution Width SD	40.0		fL	35.0-56.0
RDW-CV	Red Cell Distribution Width CV	12.8		%	11.0-16.0
PDW	Platelet Distribution Width	11.9	↓	fL	15.0-18.0
MPV	Mean Platelet Volume	9.8		fL	7.0-13.0
P-LCR	Platelet Large Cell Ratio	24.8		%	13.0-43.0
PCT	Plateletcrit	0.355	↑	%	0.100-0.280
P-LCC	Large Platelet Cell	90		10^9/L	13.00-29.00

DIFF WBSO RBC PLT

Test Time 2022-11-15 11:[illegible] Tester admin Audito Print Time 2022-11-15 17:32

REVIEWED BY .....



KURU PROVINCIAL GENERAL HOSPITAL LEVEL 5

Sample Id 27
Patient Id 879092
First name CLARA
Last name WANJIRU
Birth date 26
Bed

15/11/2022 12:33:13 Ref. class Female

Test Name	Result	Units	Normal Range	Low/High/Normal
Albumin	45.52	g/l	30.00 - 53.00	Normal
Alk. Phos. AMP IFCC	136	U/L	40 - 150	Normal
Bilirubin direct	2.45	µmol/l	0.00 - 3.42	Normal
Bilirubin total	7.75	µmol/l	2.00 - 21.00	Normal
Creatinine	75.57	µmol/l	51.00 - 99.00	Normal
ASAT/GOT	★54	U/L	0 - 31	High
ALAT/GPT	★48	U/L	0 - 34	High
Total Protein	★90.8	g/l	66.0 - 83.0	High
Urea	4.9	mmol/l	1.7 - 8.3	Normal

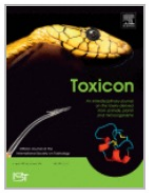
Warn 2#
Warn 2#
TIME:2022-11-15 13:04
SAMPL-No.027??
Pat ID: 00000000000000000
K 4.50 * mmol/L 3.5-5.5
Na 131.8* mmol/L 135-145 L
Cl ★111.0* mmol/L 98-108 H

DAY 10-DISCHARGE

THANK YOU MESSAGE FROM THE HUSBAND

Toxicon

Volume 248, September 2024, 108002



A brush with danger: a case report on puff adder *(Bitis arietans)* envenomation in Naivasha, Kenya

Eugene Valentine Erulu [1] ✉, Mitchel Otieno Okumu [2]

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https://doi.org/10.1016/j.toxicon.2024.108002 ↗

CASE No. 2 PROGRESSIVE WEAKNESS

- NAME: M.N
- AGE: 13
- SEX: MALE
- LOCALITY: JIMBA, APPROXIMATELY 6KM FROM THE SNAKE FARM
- DATE OF BITE: 10/11/2013, SUNDAY
- TIME OF BITE: 09:00
- PART OF BODY BITTEN: RIGHT MID SHIN, 2 BITE MARKS NO
- OEDEMA
- CIRCUMSTANCES: WAS PLAYING WITH OTHER KIDS IN A BUSHY
- AREA NEAR THE HOMESTED. BITTEN ON THE LEG BY THIS
- LONG BROWNISH.SNAKE.

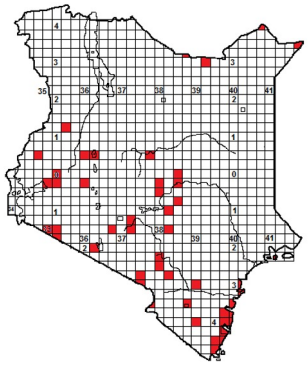
Black Mamba (D. polylepis)

1.5 – 2.5 m up to 3.2m

May be grey, almost white, olive, brown, or yellow brown; paler below

Widespread in medium to low altitude savanna, woodland and coastal bush

Found near the following towns; Mombasa, Watamu, Malindi, Voi, Mtito Andei, Mwingi, Kisumu



CASE PRESENTATION

- ON NOTICING HE HAD BEEN BITTEN BY A SNAKE HE RUSHED HOME

- BLACK STONE IN BITE SITE

- PRAYERS

- SOON AFTER STARTED FROTHING FROM THE MOUTH WITH LABOURED
- BREATHING.

- RUSHED BY HIS COUSIN TO GEDE DISPENSARY WHERE THEY WERE
- IMMEDIATELY REFERRED TO THE SNAKE FARM.

THE 13 YEAR OLD BOY ARRIVED AT THE SNAKE FARM WITH HIS COUSIN FROM GEDE JUST AFTER 10:00

HE WAS IMMEDIATELY DRIVEN TO MY FACILITY

10:15 am – Watamu Hospital

HE HAD TYPICAL SIGNS OF NEUROTOXIC ENVENOMING:

- SEMI-COMATOSE SEVERE PTOSIS WITH PUPILS NOT RESPONSIVE TO LIGHT
- SWEATING PROFUSELY
- ’BROKEN’NECK SIGN
- HYPERSECRETION
- BP UNRECORDABLE
- PULSE VERY WEAK
- OXYGEN SATURATION 83%

PATIENT MANAGEMENT PLAN

- SUCTION
- OXYGEN VIA AMBU -BAG
- 2 AMPOULES OF SAVP A/V GIVEN BY DIRECT PUSH

  THEN 2 AMPOULES IN A SALINE DRIP, AN EXTRA I/V LINE.(10:15, 10:25,10:40, 11:00)

- ADRENALIN 0.5ml S/C WHEN PATIENT DEVELOPED SEVERE URTICARIA.
- TWICE CPR.
- TOTAL RESUSCITATION TIME 2HOURS
- PATIENT ON OXYGEN 5 ½ HRS THEN WEANED
- VITAL SIGNS REVERTED TO NORMAL.
- PATIENT ADMITTED FOR CLOSE MONITORING

24 HOURS LATER.....

- AMAZINGLY HE COULD RECALL ALL THAT HAPPENED IN DETAIL THE PREVIOUS DAY INCLUDING IDENTIFIYING EACH PERSON.

Tropical Medicine and Infectious Disease

MDPI

Case Report

Revered but Poorly Understood: A Case Report of *Dendroaspis polylepis* (Black Mamba) Envenomation in Watamu, Malindi Kenya, and a Review of the Literature

Valentine Eugene Erulu [1,*], Mitchel Otieno Okumu [2,3], Francis Okumu Ochola [4] and Joseph Kangangi Gikunju [5]

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[3] Department of Public Health, Pharmacology and Toxicology, Faculty of Veterinary Medicine, University of Nairobi, P.O. Box 29053-00625, Nairobi, Kenya
[4] Department of Pharmacology and Toxicology, School of Medicine, Moi University, P.O. Box 3900-30100, Eldoret, Kenya; ochola.francis@yahoo.com
[5] Department of Medical Laboratory Science, College of Health Sciences, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000-00200, Nairobi, Kenya; jgikunju@jkuat.ac.ke
* Correspondence: drerulu@gmail.com; Tel: +254-72-243-7423

Received: 31 July 2018; Accepted: 17 September 2018; Published: 19 September 2018

Abstract: The black mamba (*Dendroaspis polylepis*) ranks consistently as one of the most revered snakes in sub-Saharan Africa. It has potent neurotoxic venom, and envenomation results in rapid onset and severe clinical manifestations. This report describes the clinical course and reversal of effects of black mamba envenomation in a 13-year-old boy in the Jimba area of Malindi. The victim presented to Watamu Hospital, a low resource health facility with labored breathing, frothing at the mouth, severe ptosis and pupils non-responsive to light. His blood pressure was unrecordable, heart rate was 100 beats per minute but thready, his temperature was 35.5 °C, and oxygen saturation was 83%. Management involved suction to clear salivary secretions, several hours of mechanical ventilation via ambu-bagging, oxygen saturation monitoring, and the use of South African Vaccine Producers (SAVP) polyvalent antivenom. Subcutaneous adrenaline was used to stave off anaphylaxis. The victim went into cardiac arrest on two occasions and chest compressions lasting 3–5 min was used to complement artificial ventilation. Hemodynamic instability was corrected using IV infusion of ringers lactate and normal saline (three liters over 24 h). Adequate mechanical ventilation and the use of specific antivenom remain key in the management of black mamba envenomation.

Keywords: black mamba; snakebite; Watamu; *Dendroaspis polylepis*; Kenya

1. Introduction

Background

The black mamba (*Dendroaspis polylepis*) is an olive brown- to grey-colored snake with a characteristic white belly (Figure 1).

It is native to eastern, southern and isolated parts of western Africa [1]. It is one of the species within the genus *Dendroaspis*. The others are *viridis*, *jamesoni*, and *angusticeps* [2]. The black mamba is ranked by the World Health Organization as one of the species of highest medical importance in sub-Saharan Africa. This is on account of the potency of its venom, the rapid onset and severity of

CASE No 3- BLEEDING

- NAME: KF
- AGE: 28
- GENDER: FEMALE
- DATE OF BITE: 11/08/2013
- LOCATION: KAKUYUNI
- TIME OF BITE: 15:00Hrs
- CIRCUMSTANCES: Walking along a bushy path and encountered a ‘long greenish snake’ crossing her path which bit her right shin about4cm above the lateral malleolus.

CASE No 3- BLEEDING

Rushed to the homestead about 500mt from the scene.

Reported to have vomited twice.

No Hx of respiratory distress or loss of consciousness.

Torniquet applied just above the bite site.

Patient taken to a local health centre, torniquet released, referred to the Malindi subcounty referral hospital - no assistance

Relatives took her to a private hospital within Malindi

Given Inj Hydrocortisone, Piriton then referred to Watamu Hospital

CASE No 3- BLEEDING

- **21:00Hrs:** Arrival at Watamu Hospital. **KF** was in good general condition, not pale, not jaundiced, the temperature was 36.9°C, Blood Pressure 110/80mmHg, pulse 72/min, good volume. The rest of the systemic examination was unremarkable.
- Locally, she had 2 visible bite marks about 4cm above the right lateral malleolus. The swelling had progressed to mid shaft with increased tenderness and warmth.
- The patient was admitted for observation. A 20 Minute Whole Blood Clotting Time was normal. She was given Paracetamol injection for the pain and advised to elevate the bitten limb.

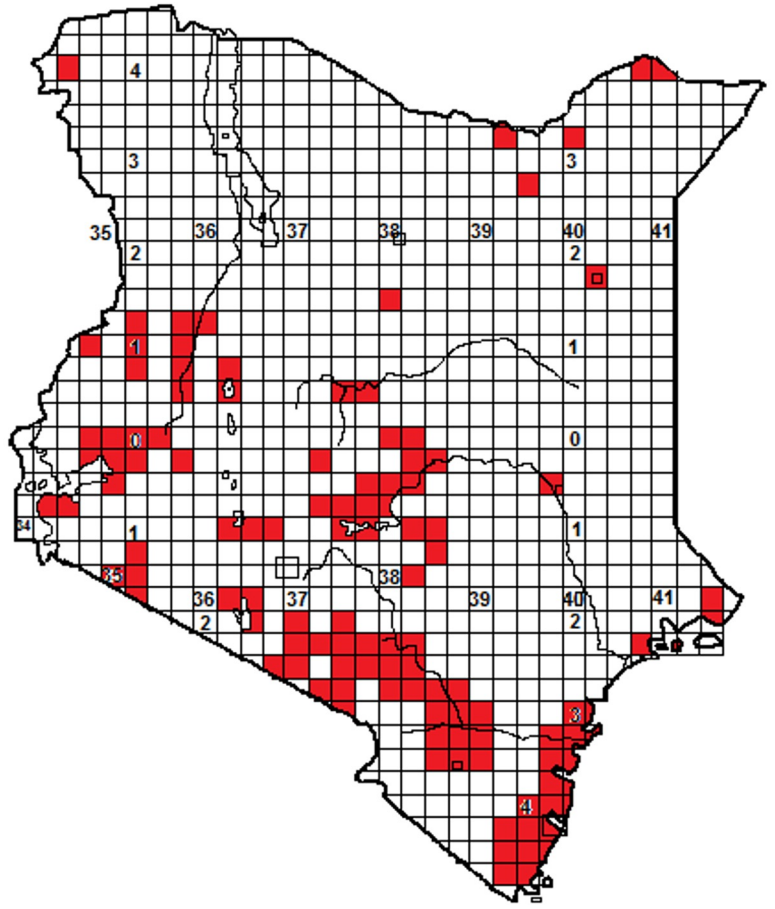
CASE No 3- BLEEDING

- **<u>DAY 2</u>**
-
- **06:30Hrs:** Patient reported bleeding from the gums after brushing her teeth. Bleeding from the injection site.
-
- **07:30Hrs:** 20min WBCT blood- incoagulable. BP 110/70mmHg, Pulse 87/min, good volume.
-
- **09:45Hrs:** Patient given subcutaneous adrenaline 0.5ml. Started on SAVP Boomslang Specific antivenom 10 ml in 200ml NaCl(18 $^{1}/_{2}$ hours post envenomation)
-
- **10:25Hrs:** Antivenom infusion completed without any reactions.
-
- **16:30Hrs:** Normal 20min WBCT.

CASE No 3- BLEEDING

- **DAY 4**
-
- **09:00Hrs:** Normal repeat 20min WBCT. Some reduction in swelling. Patient discharged in good general condition.

Boomslang(Dispholidus typus)



CONCLUSION

- every snake bite should be treated as a medical emergency — unless you're sure that the bite came from a nonvenomous snake.
- Recognize and correct any immediately life-threatening conditions and refer whenever indicated
- Provide analgesia where necessary
- Assess for local and systemic toxicity
- Minimize local tissue damage

CONCLUSION 2

- Prevent or correct any systemic toxicity (eg, hypotension, weakness)
- Prevent or correct hematologic toxicity
- Improve limb function
- Minimize harm from unnecessary and potentially dangerous intervention
- NEVER BE IN A HURRY TO DISCHARGE SNAKEBITEPATIENTS
- Symptoms and signs of severe systemic envenoming from the two haemotoxic snakes (Boomslang and
- Vine snakes) can be delayed for 15 hours or more

Thank you all for
your Attention