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台灣地區常見毒蛇咬傷 之處理及預防方式

The managements and prevention methods of the poisonous snake bites in the Taiwan region



● 眼鏡蛇
Naja naja atra

壹、前言：

在台灣每年被毒蛇咬傷的約有 300-500 人，其中 85% 是被出血性毒蛇咬傷的，引起死亡的約有 20-30 人。超過 96% 的蛇咬傷部位都在四肢（上肢稍多於下肢）。每年的 6 月到 9 月更是毒蛇出沒最頻繁的時候，而本署各單位多位處偏遠地區，海邊各安檢所周邊環境亦適合蛇類生長，因此我海巡同仁夏日更應加強防毒蛇咬傷之衛生教育，防範類似咬傷事件之發生。

在動物咬傷的案件中，在台灣以蛇咬傷最為普遍常見，也是最值得重視的咬傷。由於台灣地處亞熱帶，濕熱的海島型氣候及林木型態，非常適合蛇類之生長繁殖，再加上人類不斷擴展其生活領域，頻頻出入於深林山谷間，更增加了與蛇類接觸的機會，因此被蛇類攻擊受傷的事件時有所聞。事實上，被蛇類咬傷事件之發生，大多是蛇類出於防衛的自衛性攻擊。因此只要人蛇互不侵犯，保持距離，自然可以減低蛇咬傷事件之發生。

I. Preview:

There are approximately 300-500 people to be bitten poisonous snakes, in which there are 85% who were bitten by bleeding poisonous snakes, cause death at 20-30. More than 90% people are bitten at for four limbs, (upper limbs more than the lower limbs). During June to September each year is the most frequent period where poison snakes appear, and most of our units of Coast Guard Administration are located in the remote areas, the peripheral environment of all safety check units are the suitable places for snake growth activities. Therefore, it is needed for re-enforce the public education for the Coast Guard people with knowledge of poison snakebites, in avoidances with the snakebites incidents.



● 雨傘節
Bungarus multicinctus

During the incidents of animal bites, the most frequent matters are the snakebites in Taiwan, which is worth noticing for the bite casualties. As Taiwan is located in the semi-tropical area, with humid island climate with woods, very suitable for the growth of snakes, and added that the human expanding their activities area, frequently going into the woods, increasing the chances of snake contacts, for the snake bites incidents to happen. In fact, the incidents of snakebites, it is usually happened under self-defensive acts of the snakes. If there shall be no violation between snakes and human, in keeping distance would decrease the incidents of snakebites.

貳、分類：

依毒蛇毒性之不同，可將毒蛇概分為以下3類：

一、神經性蛇毒：如雨傘節（*Bungarus multicinctus*）、眼鏡蛇（*Naja naja atra*）。患者局部組織損傷較不嚴重，症狀亦較輕微，只有傷口流少量血，10-15分鐘內出現麻木、燒灼感。但2至72小時內全身性之症狀則至為明顯，會引起中樞神經的刺激與麻痺，造成噁心、嘔吐、流涎、眼瞼麻痺及喉頭痙攣，導致言語、吞嚥困難，如果經過4-6小時以上仍未出現症狀，則可知其毒液注入不多，但是建議應繼續觀察24小時，嚴重時甚至引起呼吸肌肉麻痺和呼吸衰竭的現象。

二、出血性蛇毒：如百步蛇（*Agkistrodon acutus*）、龜殼花（*Trimersuurus mucrosquamatus*）、赤尾鮫（俗稱青竹絲，*Trimeresurus stejnegeri*）。可引起立即灼痛、局部組織壞死、紅腫，傷口痛如刀割，同時皮膚會變紫發黑，起水泡、血泡，嚴重時引起全身性之凝血疾病，甚至造成胸、腹腔腸胃道之大出血、血尿等全身性出血現象，終因腎功能衰竭、心力衰竭而死。

三、混和性蛇毒：例如鎖鏈蛇（*Vipera russelli Formosensis*），一般較為罕見，局部分佈於台灣中央山脈南段東南部山區等中低山林、草叢及甘蔗園或綠島、蘭嶼海邊。咬後局部水腫及出血，被咬處極度疼痛。嚴重者臉唇及舌頭發生嚴重水腫可能呼吸道會被阻塞，造成腸胃、黏膜出血，血尿，瀰漫性瘀斑。甚至造成呼吸衰竭，噁心嘔吐腹瀉、腸胃道出血、低血壓及橫紋肌溶解併發急性腎衰竭。

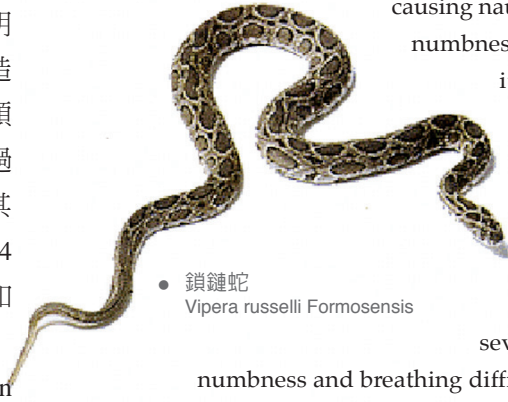
參、毒蛇中毒的毒理機轉：

出血性毒蛇所含的毒素主要有phospho-

II. Classification:

There are three classifications of the poison snakes according to the levels of toxicity,

1. Neurotic snake poison: *Bungarus multicinctus*, *Naja naja atra*. The bitten person with not severe partial damaged tissue, and slight symptoms, only small amount of bleeding, with 10-15 minutes numbness, heat. Within 2-72 hours that the systemic symptoms have become obvious, leading to neurotic stimuli and numbness, causing nausea, vomit, salivation, eye-lid numbness and oral numbness, making it hard to talk or swallow. If such symptoms are not apparent during 4-6 hours, meaning the ingested poison is not much. However, it is suggested to make observation for another 24 hours, severe cases could cause muscle numbness and breathing difficulties.



● 鎖鏈蛇
Vipera russelli Formosensis

2. Bleeding snake poison: *Agkistrodon acutus*, *Trimersuurus mucrosquamatus*, *Trimeresurus stejnegeri*. These snakebites could cause causalgia, partial tissue necrosis, inflamed, wound pain like knife cuts, at the same time, skin could go purple dark, blister, blood blister. If such case go into severity, it is possible to lead to systemic coagulation disorder, also causing severe bleeding, blood urine, such systemic bleeding disorders, causing death at renal failure and heart failure.

3. Mixture of snake poison: *Vipera russelli Formosensis*. It is generally rare found. They are found in the southeastern part of Central Taiwan Mountain, for low bush, grasses, sugarcane field, green Island, and coastal line of Lan-Yu Island. When human is bitten, partial swollen, bleeding and severe pain at the bite sites. In severity, person bitten would have lips and tongues severely swollen, causing obstruction of breathing tracks, and bleeding on intestinal tract bleeding, blood urine, pervading into hepatomb. It is also possible to cause breathing failure, nausea vomiting, diarrhea, intestinal tract bleeding, low blood pressure, and striated muscle combination renal failure.

III. The toxicology of poison snake:

The poison of bleeding snakes contained phospholipase A2, fibrinogenase, anti-blood-sugar protein, and protein coagulation factors. Swollen, bruises, pain and severity, which could lead to coagulation defects, systemic hemorrhage. High concentration of bleeding snake toxics could lead to coagulation enhancements.



lipase A2、fibrinogenase、抗凝血醣蛋白、促凝血醣蛋白等。造成咬傷處腫脹、瘀血、疼痛，嚴重時並可導致凝血不全、全身性出血等症狀。高濃度的出血性毒蛇毒素也有可能導致促進凝血之作用。

神經性毒蛇之毒素主要有眼鏡蛇的cobrotoxin、phospholipase A和心臟毒素、雨傘節的bungarotoxin等毒素，作用於運動神經與肌肉接合處，而造成橫紋肌不收縮，迅速導致呼吸麻痺。

混和性之毒素則較為複雜，包括凝血、溶血素、神經毒及海蛇的心臟毒與肌肉毒性等，均會造成神經毒性與出血。

肆、分辨毒蛇之毒性：

- 一、**牙痕**：有毒蛇有兩根毒牙在上額，可在小牙痕前方或前方外端發現明顯之齒痕，無毒蛇之牙痕是兩排或數排均勻的齒列刮痕，傷痕類似皮膚挫傷。
- 二、**頭形**：有毒蛇頭部外型呈大三角形，無毒蛇則成橢圓形。
- 三、**瞳孔形狀**：有毒蛇呈現橢圓形，其「面相」較為兇惡詭詐，可說是面漏凶相，眼露凶光，無毒蛇則是圓形的瞳孔。
- 四、**鼻孔裂隙**：有毒蛇在鼻、眼之間有一小孔，無毒蛇則無此特徵。
- 五、**蛇尾腹部鱗片**：有毒蛇為單邊排列，如U字形連續垂直排列，無毒蛇為雙排並列，如呈W狀連續垂直排列。
- 六、為避免分辨之誤差，可依現場狀況將蛇活捉或打死裝入容器內，送醫鑑定時可作為重要參考。

伍、個人緊急處置：

- 一、**保持冷靜**：一旦被毒蛇咬傷，千萬不可驚慌失措，需先記住該蛇的特徵，力持鎮靜，於原地躺下休息，勿劇烈運動，以免增加血液循環，幫助毒液之散佈。並立即除去被咬傷部位之戒指、手環等束縛物，以免腫脹後無法拔除。
- 二、**立即縛紮**：於傷口之上方近心端5至10

Neurotic poison snake toxics is primarily Elapidae's cobrotoxin°Bphospholipase A and heart toxics, Bungarus multicinctus's bungarotoxin, which act in the connection between motor neurons and muscle sites, causing non action of striated muscle, which effectively cause breathing numbness.



● 百步蛇
Agkistrodon acutus

The mixture toxins are more complicated, including

coagulation, Hemolysin, neurotic toxins, and the heart toxins of sea snakes, and muscle toxins; in terms will all cause neurotic toxins and bleeding.

IV. Identification the toxicity of the poisoned snakes:

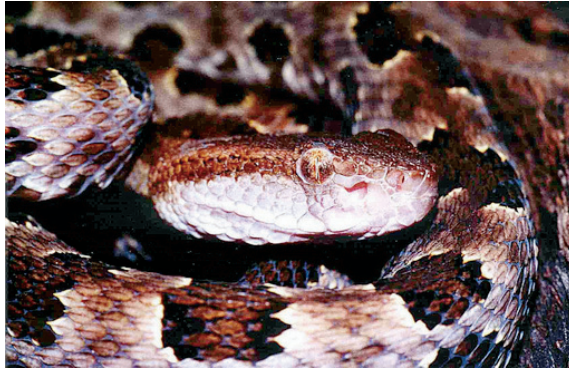
1. **Teeth bites**: the poisoned snakes have two poisoned teeth on the upper jaw, with the bite front or outer part shows distinct biting signs. The non-poisoned snakes are two sets or few sets of averagely biting sign, with the biting signs at skin cuts.
2. **Snake head**: the poisoned snake show big triangle head, non-poisoned snake have rounded head.
3. **Shape of the snake eye iris**: the poisoned snake show round, with "evil" faced, we can say that the face have killing sign and eyes. Non-poisoned snakes have rounded eye-iris.
4. **Nostril fracture**: there are a small piece between noses and eyes of poisoned snakes, but the poisoned snakes do not have this signs.
5. **The abdominal**: the poisoned snakes have single layer, layered with U shape subsequent longitudinally, the non-poisoned snakes have double layered, shown with W shape subsequent longitudinally.
6. In order to avoid any discrepancies, it is needed to kill the snake dead and place them into containers, for the hospital check ups.

V. Personal Emergency Managements:

1. **Cool down**: once bitten by snakes, it is never to panic, but to remember the characteristics of snakes, and to calm down first, rest at the same place, no active activities, in avoidance with increasing blood circulation, to avoid the poison spread around the whole body. It is necessary to get rid of the bitten part of the rings, or other restrained items, to prevent the items that cannot be taken off after the incident site is

公分處，以止血帶（或繩索、領帶、彈性繃帶）結紮，以滯緩靜脈及淋巴系統之流動，減緩毒液之擴散及吸收，但不可紮的太緊或太久，以免阻斷動靜脈血流發生循環障礙，反易造成使肢體腫脹壞死更加厲害。縛紮後每 30 分鐘需放鬆 1 至 2 分鐘，此外，可以使用夾板固定患部，傷口放置位置則需低於心臟。

- 三、**吸除毒液**：可以使用吸血管（Sawyer Extractor），儘量不要用口吸，因為蛇的毒牙又細又長，傷口不大、卻很深，要用嘴吸出毒液，幾乎不可能，況且台灣地區牙週病患者為數不少，一旦毒液經由口腔內之傷口進入，反而造成援救者毒害或病人之傷口感染的危險。若不慎吞入少量毒液進入消化道，則不必擔憂，因毒蛇本身是一種蛋白質，它在消化道中可被消化酵素分解而失去毒性。
- 四、**不要切開局部傷口**：毒液常注入較深部組織且吸收快速，因此切開傷口並無法將毒液清出，易造成感染或因切割方式錯誤致使癒合不良。
- 五、**清洗傷口**：以 1% 濃度的過錳酸鉀溶液或 2% 的氯化鈣溶液沖洗傷口，若無法取得此溶液時，亦可利用大量之生理食鹽水、肥皂水或清水加以沖洗。
- 六、**傷者不可飲用酒類及茶、咖啡等飲料**，以免促進血液循環反而使毒液吸收更快。以毛巾冷敷則可減緩毒液之擴散，但要注意不可將冰塊直接放置於傷口上，以免因局部血液循環變差，血管收縮或壞死，並使肢體腫脹壞死更加惡化。
- 七、**若患者呼吸及心跳停止則必須立即予以心肺復甦術**，維持其心肺功能之正常。儘速送醫。謹慎且迅速地使彈性繃帶壓迫包紮及固定法，相信可減緩各種蛇毒的吸



● 龜殼花
Trimersuurus mucrosquamatus

swollen.

b) Immediate tight up. At the site which is close to heart at approximate 5 - 10 cm, to use the band-aid (tie, flexible band-aid) to tight up, in order to slow down venal and the lymphatic system movements, to slow down the toxics from spreading and absorptions, but it is not appropriate to tie too tight or too long, in prevention of blocking venal blood flow and

to avoid circulation obstacles, which would cause necrosis of the limb. After it is tight up for 30 minutes, it is to lose up for 1 to 2 minutes, and to use solid plate to re-enforce the effective site, and the bitten site should be located lower than heart.

3. **Sucking up poison**: Sawyer extractor could be used to suck up the poison, to avoid sucking up by mouth. As the poisoned snakes teeth are thin and long, and the bitten site are not enormous, but keep. If we are to use mouth to suck up such solution, it is impossible. And there are a lot of people suffering from peridontitis, after the poison is entered into the oral cavity to the injured site, then it would increase the dangers of patients and the helpers too. If by accidents that the poisons enter to the digestive tract, then it is not to worry. As the toxics are one kind of protein, which the toxicity would be lost after it enters to the digestive tract.
4. **It is to avoid cutting the partial cut**: the poisons often enter to the deeper tissue and absorbed rapidly. Therefore, when we cut the wound open and take out the toxins, it is possible to cause infection and not appropriate healing process could then occur.
5. **Cleaning wound**: to clean up the wound with 2% KMnO4 solution or 2% CaCl2 to rinse the solution, which large quantity of saline solution, soap water or pure water.
6. **The patients are suggested not to drink alcohol, tea, coffee**, in prevention of enhancements of blood coagulations, which would increase the absorption of poison absorptions. It is to use towel to ice-packed on the effective site, which could slow down the poison spreading, but not to use ice-bag directly on the wound, in avoidance with local blood circulation worsens, or blood constraints or necrosis, which will worsen the limb swollen and necrosis.
7. **If the patient is suffering from heart rate stop**, or it is immediately asked to use CPR, in order to retain the normal lung function, it is immediately asked to send the patient to the hospital. It is also sensible to tight up the wound with forcible and locate the place properly. It is also to alleviate all



收及毒性的產生，爭取醫療時機。

kinds of toxics absorption and toxins effectiveness, to save some time for medical managements.

陸、送醫後之進一步處理方式：

- 一、**確定毒蛇種類**：根據各方所得之資料，判定毒蛇之種類，以便準備適合的抗毒血清，但必須在注射前進行抗血清敏感試驗。相關抗蛇毒血清資訊可以向台北榮總毒藥物諮詢中心、衛生署疾病管制局昆陽辦公室聯繫。
- 二、**中和蛇毒**：可採靜脈點滴或是局部注射抗毒血清，若無法判別毒蛇種類時，則以抗溶血毒與神經性毒血清合用。
- 三、**密切觀察傷者之生命徵候** - 血壓、呼吸、脈搏及體溫等。
- 四、**預防與減輕蛇毒性發作**：以靜脈輸液療法治療休克，必要之肌膜切開術可減輕肢體腫脹避免間室症候群的發生，或以高劑量腎上腺皮質素保護組織細胞，但要注意血清病之發生。
- 五、**在傷口附近做標記**，給血清之前每 15 分鐘測量傷口變化情形，之後每 1-2 小時記錄腫脹情形，可作為追加血清或傷口發炎指標。
- 六、**進一步處理傷口**：可使用破傷風類毒素 (Tetanus Toxoid)、廣效性抗生素，以預防合併症之產生。
- 七、**若傷口持續劇痛**，可使用嗎啡類止痛劑止痛。
- 八、**持續觀察病情變化**，直到確定危機解除。
- 九、**對抗蛇毒血清有過敏反應約有 15% 的患者**，此時可利用抗組織胺及類固醇，仍要設法注入血清，才能解毒。

柒、預防方法：

- 一、**登山郊遊**若遇有雜草叢林時，最好穿上長褲、長靴、戴手套。
- 二、**以手杖、樹枝撥動草叢**，來個所謂打草驚蛇，待毒蛇隱盾後再前進。
- 三、**平時熟知毒蛇的生活習性**，行動處處小心，能夠人蛇互不侵犯，井水不犯河水。

VI. The first management after being sent to hospital

1. **To ensure the classification of the poison snake**: according to all the information gathered, it is to judge the classification of the snakes, in order to prepare the appropriate anti-serum. It is needed to test the sensitivity test before ingested the anti-serum. All the poison snake serum could be consulted to Taipei Veteran General Hospital, CDC of DoH at Kuen-Yang Office.
2. **Neutralizing the snake poison**: it is sensible to use intravenous solution or injected with anti-toxin serum at the site. If it is not possible to judge the classification of the poisoned snake, anti-hymolysin and neurotic poison serum is combined for treatment.
3. **Closely observe the patients' life symptoms**, blood pressure, breathing, and pulse and body temperature.
4. **To avoid and alleviate the snake toxins effects**: to use intravenous therapy to treat shock, and to cut the muscle layer to alleviate limb swollen, and avoid room syndrome, to use high dose of adrenaline to protect the tissue cells, and to notice with serum diseases to occur.
5. **To mark around the wound**. It is to measure the wound changing situations before giving serum 15 minutes before, thereafter every one to two hours to record the swollen situations, for the indicator of the serum or wound infections.
6. **Further managements of wound**: tetanus toxic could be used, broad-spectrum anti-toxins for preventions of combination factors.
7. **If the wound continues to cause pain**, morphine could be used to ease the pain.
8. **It is to continuously observe the situation**, to ensure the danger have eased down.
9. **There are approximately 15% patients suffering from anti-snake serum**, which NSAID or Steroids could be used, but it is still sensible to ingest serum for detoxification.

VII. Avoidance measures:

1. **To wear long trousers and long shoes, and gloves.**
2. **Use sticks to wipe the glasses, to scare away the snakes.** After the snakes have gone away, and then start moving.
3. **To be familiar with the poisoned snakes, and act carefully,** not to disturb or violate poisoned snakes, not to overlap between the snakes and human activity areas.
4. **Not to catch snakes or play with snakes.** It is to wear long shoes and long pants, not to bear footed or wear tones within the snake's areas.
5. **When going over a big rock or wood, it is to notice there**

- 四、勿抓蛇或逗蛇玩。在毒蛇出沒地區活動，宜穿皮靴或厚長褲，勿赤腳或僅穿拖鞋。
- 五、跨越石塊或木頭等物品時，應注意防另一側可能有毒蛇棲息。
- 六、露營時應選擇空曠而乾燥地區，避免紮營於雜物堆附近，晚上應升起營火或火炬於營帳周圍，尤其是夏天的夜晚。
- 七、大部份毒蛇皆是游泳高手，所以在毒蛇常出沒的地區，勿涉水或游泳，以防被水中毒蛇咬傷。蛇類喜歡棲息的地方如：草堆、石縫、枯木、竹林、陰濕處、溪畔等，經過時應特別注意毒蛇出沒地區活動，宜穿皮靴或厚長褲，勿赤腳或僅穿拖鞋，因此在未詳細觀察審視前，勿以空手伸入空洞、濃密的雜草堆中，避免清晨或夜間在草叢、石堆處活動，以防蛇咬傷。
- 八、蛇多不會主動攻擊，不可故意招惹挑釁。

捌、結語：

事實上，蛇咬傷並不可怕，一般來說，被毒蛇咬傷後，約有2分之1到3分之2的人會中毒，而這些中毒者只有4分之1左右情況較為嚴重。也就是說，被蛇咬傷以後約有6分之1到8分之1的人情況比較嚴重。因此被蛇咬傷並不代表死亡，只要保持冷靜的態度，下正確的判斷快速的處理，必可以化解蛇咬傷的危機。

參考資料：

- 1、毒蛇咬傷的臨床診斷及治療
Chin Med J (Taipei) 1996;57:S244.
- 2、毒蛇咬傷與抗毒血清之應用
Chin Med J (Taipei) 1998;61:S9.
- 3、毒蛇咬傷在台灣 1999 內科學誌

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should possibly have poisoned snakes there.

6. It is to choose the ground or dry land when camping, do not camp at the grasses, and to light up fire at the camping site, especially during summer nights.
7. Most of the poisoned snakes are good swimmers. It is to avoid swimming or go over water when the snakes present, to avoid being bitten by poisoned snakes. The snakes like to go to areas such as: grasses, rock sites, dried wood, bamboo woods, dark sides and lakesides. It is noticeable to check with the snake active areas, and to wear long shoes and pants, not to bare foot or wear tones. Before carefully observation, to avoid use bare hand going to hollow cavities, heavy grasses. To avoid actively work at morning or night in the grasses, rock to avoid snakebites.
8. Snakes do not attack themselves. Do not violate them intentionally.



● 赤尾鮫
Trimeresurus stejnegeri

VIII. Conclusion:

In fact, the poison snakebites are not scary. After bitten by poison snakes, approximately half or 2 third would be poisoned. And only one quarter of these patients would be seriously affected. Therefore, there shall be one-sixth to one-eighth suffering from severe condition. The poisoned snakes do not show death, but if we are to keep calm, and sensible judgments are being made, then the dangers from snakebites will be avoided.

References:

1. The clinical diagnosis and therapy of poisoned snake bites. Chin Med J (Taipei) 1996; 57:S244.
2. The snake bites and anti-serum application. Chin Med J (Taipei) 1998; 61:S9.
3. The snake bites in Taiwan. 1999 內科學誌

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