



Trunk Paralysis in Asian Elephant. My Observations. Alan Roodcroft. September 2009.

Introduction.

I have heard people talk about paralysis in Asian elephant's trunks since I have been in the business some 47 years. I still don't have a full comprehension concerning this matter but I wanted to share my thoughts so far. Now, some of you will not agree with my thoughts on this topic, but that's OK as long as you are using none sentimental rational and experience. I met my first elephant that had trunk paralysis back in the early 70's at the Hagenbeck's Tierpark in Hamburg, her name was Birka and she was in her late forties. Trunk paralysis occurs in both zoo and circus elephants, but I have never witnessed it in Asia in working camps or in the wild, that's not to say it wouldn't happen there, given the right circumstances, temple elephant for example don't move too much so this might be a condition that effect them.

I have never seen this condition in one mature Asians bull in zoos, animal with large tusks, and I have only ever heard of one tusk-less male Asian elephant with this issue in France, (photo to the right), in what they call in Asia, a Mackna.



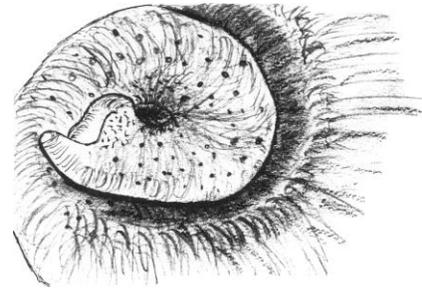
I don't believe that the type of paralysis I want to talk about in this article is not to be confused with the situation that occurred in Africa some years ago when a large number of elephants suffered from trunk paralysis affecting the whole trunk and not just a portion as I have found affects the Asian elephant.

Historical explanation.

I have heard many explanations since I have been in the business of how this happens. In circus elephant for instance, the phenomenon has long been explained as the result of harsh treatment, elephants being beaten repeatedly on the face damaging the muscles and rendering the trunk useless or when the elephants travel in the box cars on the railway they have to brace themselves against the wall of the wagon when it stops or makes abrupt motions. I have heard this explanation mostly from none circus enthusiast and not from circus followers. This explanation, of course, is very hard to substantiate or prove or disprove one way or another, it doesn't explain, however, the number of zoo elephants that also have the same condition who have not been riding in a rail-car. In zoo's funny enough, I never heard or was offered an explanation for this condition even though it is well known in zoos also.

Elephants I have known.

I have known in my career many elephants with trunk paralysis and I believe it has been going on ever since elephants have been in captivity, some 5000 years. It occurs on both continents in all countries that have been keeping elephant in zoos and using them in circuses. The photos below show some of the elephants I have seen and known and you can see they all have one similar characteristic, a long trunk face.



Birka.



Kitty.



Annie,



Juno.



Dinah.



Mona.



Benson's Wild Animal Park.

The above elephants are just a small cross-section of the elephants I have known. Birka at the Hagenbeck's Tierpark in Hamburg, Germany was the first elephant I recognized as having a paralyzed trunk; she lived up into her mid-sixties. Kitty is up at a park in Canada still alive and doing very well. Annie was at the LA Zoo in California where she lived for a number of years. Juno an ex-circus elephant is at the El Paso Zoo in Texas is in good condition and thriving. The elephant Dinah, I met the Copenhagen Zoo, Denmark in 1974 I was told she came from Sweden where she was a circus performer some years earlier. During a recent conversation with one of her old keepers, September 2009, I was told that on her arrival at the zoo she could not lift her trunk over her head and had the typical trunk paralysis signature with only 18" grasping ability at the end of her trunk. Mona was also at the El Paso Zoo and had been for years, she eventually passed away some time in the late 90's early 2000. The elephants at Benson's Wild Animal Park in New Hampshire, USA were moved to other locations when the park closed

down, shortly after this photo was taken. I noticed that one elephant on the left in the photo could not lift her trunk when she was asked and the elephant on her left had to swing her head in order to get the nose in the air, this was all during the daily demonstration at the park. The African elephant in the show had no problems with her nose.

My take on the situation.

The condition has many of the same characteristics in all of the elephants I have seen and known. Basically the condition effects, among other places on the trunk, the top of the trunk where it meets the face, there a mass of muscles attached to the skull around where the nasal cavities are located, this muscle mass is where the main attachment and lifting ability comes from. Latest figures suggest that there are 100,000 muscles and ligaments in the trunk of an Asian elephant. This muscle complexity of the trunk would suggest I think that all manners of mis-function can occur with an elephant nose. I have not witnessed this condition in captive African elephants.

Eating and drinking characteristics.

When sitting watching elephants eat you can learn a lot about how the elephant functions. For instance, an elephant with a normal trunk function will throw small pieces of apple let's say straight up into their mouths.



Normal.



Paralyzed.

The two photos above are of an elephant on the left with full trunk function and the one on the right is a trunk paralyzed animal. Both animals were in the same point of throwing a small piece of food into their mouths, they both operate the same when throwing food, but when they are dealing with hay or water they have completely different postures. For drinking water the paralyzed elephant must fill its nose with water then throw its trunk with a swinging motion up very similar the photo above and catch the end in its mouth then squirt the water into to its mouth. The elephant with normal function fills its trunk with water then lifts its head up high and with a combination of squirting and gravity the water runs into its mouth. The hay delivery systems are different also, normal elephants role the hay into bite size amounts and lift their

trunks and place the hay on the tongue which in turn transports the hay to the back molars. Elephants suffering from paralysis gather a trunk full of hay make their bit size portion and swing it up to be caught on the lips where the tongue comes into play and does the same thing as the normal elephant.

Muscle atrophy.

Now, this is the section where I will be a little out of my depth as far as anatomical experience is concerned and might reach for explanations, but bare in mind I wanted this article to be the beginning of discussion not seen as the last word on the topic. So, fire away with what you have witnessed and let's make sense out of this riddle. As I said earlier there is a cross-section of people who believe that this condition could be caused by force, by deliberate hitting on the trunk by the elephant handler or by the elephant in the circus trying to support itself inside the train car or truck as they are traveling. I don't hold to any of those explanations because the elephant trunk is far too strong for only sporadic force to cause damage the trunk that then in turn causes the amount of abnormal function that occurs in these animals with trunk paralysis. Extreme damage can occur when an elephant loses parts of their trunks, yes, there are many young and old elephants that have lost a part of the trunk because the program routine of the institution isn't tight enough and a door chops a portion of the nose off. My personal take on trunk paralysis in Asian elephants is that it is a progressive atrophy that takes a long time to become fully debilitating and can at the right moment in the atrophy process under close observation and intervention, be reversed.



Advanced atrophy of the trunk is hard to detect. Look at the elephant in the photo this elephant is at this point when I took the photo throwing her head up towards a hay net feeder, the trunk is basically useless she is using it to hit the hay feeder like a stick to dislodge the hay so she can eat it from the ground, but this photo clearly shows another important aspect of trunk paralysis, it shows the muscle loss, the atrophy at the base of the nose. Look closely and you will see a ripple effect where the red arrows are pointing, a total lack of muscle tone and condition, this is paralysis in its advanced stages, the point of no return has been passed for this elephant. It is however unusual to see this muscle loss in most trunk paralyzed elephants because they never lift their nose this high.

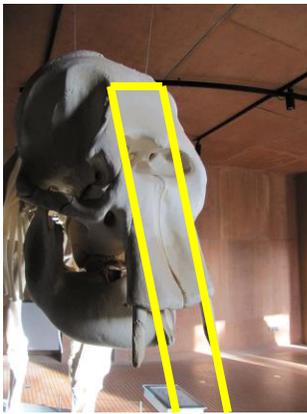
The tipping point.

Can this condition be reversed? I believe yes. There is a tipping point, where the trunk has not past the point of full atrophy and can be brought back with a lot of work. I remember an elephant in her late teens or early twenties that arrived at a privately run facility some years ago that had started to have problems lifting her trunk, the owners who were very experienced

elephant people noticed the issue and started a series of exercises and actually reversed the condition to the point where she could lift her trunk fully.

So what happens?

The trunk of an elephant is a very complex organ, they tell us that it is an elongation of the upper lip and the nose, evolved and developed over millions of years into a sensitive, multi-tasking appendage. An elephant can lift something as small as a coin or something as large as a tree log. The muscles and tendons allow the elephant to move the trunk in many different directions, up, down and from side to side. The African elephant being primarily a browser by origin has far more ability with its trunk and a different grasping capability. But even with this sensitive appendage they can both deliver a very hard blow to an enemy when protecting themselves or their young.



The trunk's attachment to the head must be quite complex with muscle, nerves and tendons connecting to the skull coming down the front of the face in all directions to feed the trunk. I will spare you my understanding of the details of the trunk's attachment, but from my observation the atrophy has degrees of development starting with mild dysfunctional lifting to full on only 18 to 20 inches of the tip of the trunk being operable. All of the elephants with full paralysis that I have seen or known only have 18 to 20 inches at the end of the trunk that can be used. Coincidence? No, it is a fact of the condition. So why do only a few elephants fall victim to this condition? My thoughts are that only a few individuals in the population fall into this category

because they are physically pre-disposed because of hereditary weakness in the trunk anatomy. Combine this to none regular use then you have a situation of "you don't use it, you lose it"

Adding to the problem elephants, Asian and African alike in our zoos have always been fed in a pile on the floor, this is how I learnt how to feed elephants and it is unfortunately still being done in many places.

New ways of feeding Asian elephants are emerging, elevated feeders make the elephants use their trunks



shoulders and backs more. We are seeing better muscle

development in their shoulders and backs, stronger necks and trunks. The photo to the left is of an elephant at the Knoxville Zoo where their feeding program is aimed at physical development of the elephants, the elephant in the photo has developed clearly discernable neck muscles and muscular shoulders, from elevated feeding.

Conclusion.



I guess there isn't a conclusion to this report, more a heads up. Trunk paralysis doesn't seem to affect longevity as I have known elephant with paralysis that have lived into their sixties. It doesn't affect every elephant, even if they are kept with minimum trunk activity opportunities whether in the circus or a zoo. Elephants in nature are varied feeders they eat from the ground but do, percentage wise, eat from the branches, so high suspended feeders will be a benefit to the muscle tone and the overall condition of the elephant.

One other point. I have never seen any scientific research on this topic, neither necropsy reports nor comments leading to information concerning trunk atrophy.

Other reading and program support literature by the same author.

- Indoor Natural Substrates for Elephants & Medical Issues Associated with Hard Surfaces. October 2004.
- Protected Contact of Elephants in Europe. October 2005.
- Chutes, Drugs & PC. August 2008.
- A Short Foot Work Overview. August 2008.
- A Suggested Elephant Translocation Standard. September 2008.
- Immobilization Procedure in Elephants. 1996.
- The Geriatric care of older elephants. April 2009.
- A Clear Definition of Protected Contact. September 2008.
- Asian Elephant Breeding Behavior. April 2009.
- Gravity and hydrotherapy procedures as a way to reduce the possibility of stiffening joints after an accident in elephants. August 2006.
- Jumbo Job. June 2008.