

Surgical Management of Temporal Bursitis in a Captive Asian Elephant

Indramani Nath¹, Subharaj Samantara^{1*}, Jacob V. Cheeran², Ashoka Dangolla³, and Susen Kumar Panda¹

¹College of Veterinary Science and Animal Husbandry, Odisha University of Agriculture and Technology, Bhubaneswar, Odisha, India

²Cheerans Lab (P) Limited, Trichur, Kerala, India

³Faculty of Veterinary Medicine & Animal Science, University of Peradeniya, Peradeniya, Sri Lanka

*Corresponding author's e-mail: subharaj36ovc@gmail.com

Introduction

In elephants, temporal glands are located beneath the skin midway between the lateral canthus of the eye and the external auditory canal in the temporal fossa on either side of the face (Fernando *et al.* 1963; Estes & Buss 1976). During musth, testosterone levels in temporal gland secretions are at much higher levels (547.16±150.53 ng/ml) compared to non-musth (Rasmussen *et al.* 1984; Sukumar 2003). The temporal gland is commonly also a site for abscess formation (Mikota 2006). Musth bulls also rub the temporal area on trees more often (Sukumar 2003) which may lead to a swelling due to temporal bursitis. Therefore whether a temporal swelling is an abscess, enlargement of the temporal gland or due to bursitis has to be differentiated. This can be differentially diagnosed by proper anatomical, hormonal and biochemical study of the aspirate and histopathological study of the secreting membrane.

Case study

“Shankar” was a male captive Asian elephant at the Chandaka Elephant Sanctuary in Odisha, India. He was aged about 25 years and had a history of coming into musth once annually during the months of March to June. Shankar developed a swelling near the left temporal area in September 2011. On 10.9.2011 (day 0), when first noticed, it was approximately 2 cm in diameter and reached a size of 16 cm in diameter within a fortnight. The swelling was soft, fluid filled and was movable (Fig. 1). Ice cubes were applied daily for 15 min over the surface of the

swelling from 10.9.2011 to 16.9.2011 (for 7 days), however, there was no improvement.

On 24.9.2011 (day 15), the elephant was physically restrained with the help of experienced mahouts. After aseptic preparation of the site, 10 ml of fluid was aspirated from the swollen mass into a disposable syringe from the most dependant site. The collected fluid and a blood sample from the ear vein were sent to the laboratory of the College of Veterinary Science and Animal Husbandry, for examination. The blood sample was processed for estimation of Hb (g%), TEC, TLC, DC. The fluid was translucent and light yellow in colour and did not clot on standing.

Results of the laboratory tests indicated absence of infection (Table 1). The testosterone concentration in the aspirate was very low (Androstenedione 0.1 ng/ml, free testosterone 0.68 pg/ml and testosterone 0.31 ng/ml) indicating that it was not an enlargement due to musth secretion. Therefore the swelling was diagnosed as due to bursitis.

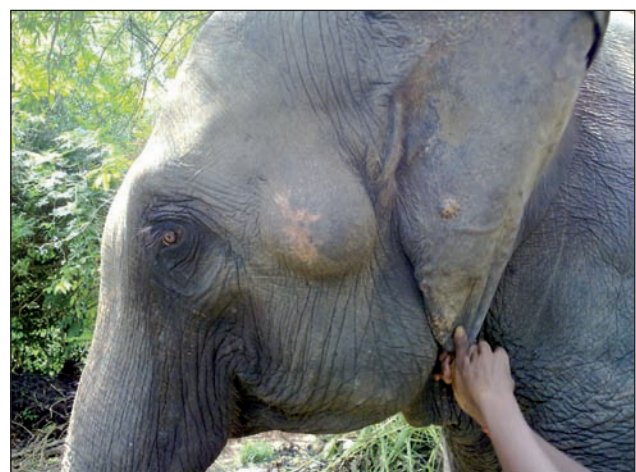


Figure 1. Swollen mass in September 2011.

Table 1. Results of the laboratory tests*.

Date	24.9.2011	4.3.2012	10.7.2012
Cells present in the aspirate			
Neutrophil	few	few	occasional
Lymphocytes	few	occasional	occasional
Eosinophils	occasional	occasional	occasional
RBCs	few	few	few
Presence of growth (BHI broth)	no	no	yes

*No significant findings were detected in the hematological reports.

Subsequently, about 200 ml of the fluid was drained out from the swollen mass. Hot fomentation helps in faster healing of wounds by increasing circulating white blood cells, promoting increased blood flow to skin and thereby relieving internal congestion and by facilitating removal of debris. Therefore, hot fomentation was applied for 20 min twice daily on the swelling for a period of 7 days. The size of the mass gradually reduced and by the 7th day post aspiration, it reached a size of 14 cm in diameter. Gradually the swelling became harder, while there was no further reduction in the size of the swelling till 20.2.2012 (day 164). The hardening of the swollen mass may be due to chronicity, which is often characterized by the accumulation of bursal fluid and thickening of the bursal wall by fibrous tissue; fibrous bands and septa may develop in the bursal cavity, and the subcutaneous tissues around the bursa may continue to thicken (Baxter 2012).

On 4.3.2012 (day 177), the swelling suddenly increased almost to the previous size but was hard, compared to 24.9.2011. The fine needle aspirate this time was light yellow in colour. A total volume of about 120 ml of fluid was removed through a small incision made on the most dependant part and submitted to the laboratory for investigations (Table 1). The cavity was irrigated with povidone iodine 5% lotion and hot fomentation was applied for 20 min twice daily. This process was carried out on a daily basis till we felt that no exudate/transudate was present inside the swelling i.e. till 3.4.2012 (day 207). By this time the swelling was reduced to a diameter of 12 cm and converted into a hard mass.

It was decided to do exploratory surgery because of the re-occurrence of the swelling. After administration of tetanus toxoid, longitudinal surgical incision on the most dependent site to facilitate drainage, destruction of the secreting membrane (approximately 2-3 times) and scarification is essential for healing of the surgical wound. However, surgical intervention requires perfect aseptic techniques, regular wound dressing and proper post-surgical care for healing of the wound, which is very difficult under field situations. It is also felt that at times bursitis could lead to delayed wound healing if surgically operated. However, the advantage in this case was the vicinity of the wound to the ear, flapping of which helped in preventing flies contaminating the wound.

On 10.7.2012 (day 305), under xylazine-ketamine sedation, an opening was made with a cross (+) incision on the most dependant part of the swelling, where the previous linear incision had been done for drainage. A small amount of white synovial concretions also came out along with the fluid. The fluid and as much as possible of the secreting membrane was removed (Fig. 2) and sent to the laboratory for investigation.

The fluid aspirated on 10.7.2012 indicated bacterial infection (Table 1), possibly due to the entrance of pathogens during previous aspirations of fluids. Antibiotic sensitivity tests of the aspirated fluid revealed the highest sensitivity for cefixime, levofloxacin, pefloxacin, amoxycillin, enrofloxacin, ciprofloxacin; moderate sensitivity for ceftriaxone with tazobactam; and resistant for streptomycin, chloramphenicol.



Figure 2. Removal of the secreting membrane.

The cavity was debrided, irrigated with hydrogen peroxide solution and povidone iodine soaked gauze was placed inside the cavity. The rest of the secreting membrane, dead and necrotic materials present were removed on 13.7.2012 (day 308) and the wound was irrigated with povidone iodine solution and multi-action skin ointment (Charmil Plus Gel, Ayurved Limited, India) was applied on the wound. The cavity was again debrided removing necrotic material and a paste of glycerine, copper sulphate and magnesium sulphate was applied on the inner surface of the wound on 20.7.2012 (day 315). As iodine is an irritant, from the next day onwards a paste of amoxicillin and glycerin was applied on the inner surface of the wound based on the antibiotic sensitivity test (Table 1), multi-action skin ointment was applied on the wound surface and hot fomentation was applied for 20 min twice daily over the swelling.

Currently Shankar is doing well and the mass has reduced to a size of approximately 8 cm in diameter (Fig. 3). Filling of the cavity has started from the upper part and treatment is ongoing.

Acknowledgements

The authors are very much thankful to Mr. Jayantha Jayewardene, Managing Trustee of the The Biodiversity & Elephant Conservation Trust (BECT), Sri Lanka for facilitating the discussion process and Dr. Kushal Konwar Sarma, Professor and Head, Department of Veterinary Surgery and Radiology, College of Veterinary Science, Assam

Agricultural University, Khanapara, Guwahati, Assam, India for his timely and valuable suggestion given.

References

Baxter GM (2012) Management of Bursitis. In: *Equine Surgery. 4th Edition*. Auer JA & Stick JA (eds) Elsevier, Missouri. pp 1148-1150.

Estes JA & Buss IO (1976) Microanatomical structure and development of the African elephants' temporal gland. *Mammalia* **40**: 429-436.

Fernando SDA, Jayasinghe JB & Panabokke RG (1963) A study of the temporal gland in an Asiatic elephant (*Elephas maximus*). *Ceylon Veterinary Journal* **11(4)**: 108-111.

Mikota SK (2006) Integumentary System. In: *Biology, Medicine and Surgery of Elephants*. Murray EF & Susan KM (eds) Blackwell Publishing, USA. pp 254.

Rasmussen LE, Buss IO, Hess DL & Schmidt MJ (1984) Testosterone and dihydrotestosterone concentrations in elephant serum and temporal gland secretions. *Biology of Reproduction* **30**: 352-362.

Sukumar R (2003) *The Living Elephants: Evolutionary Ecology, Behaviour and Conservation*. Oxford University Press, New York.



Figure 3. Present condition of the swollen mass (August 2012).