

## Dystocia in a Rothschild Giraffe at the African Fund for Endangered Wildlife, Nairobi, Kenya

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### Abstract

A 15-year old female Rothschild Giraffe (*Giraffa camelopardalis rothschildi*) weighing approximately 800kg, at the African Fund for Endangered Wildlife (AFEW), Giraffe Center, Langata, Nairobi, Kenya was presented with dystocia in June 2010. This giraffe named Laura, had a protracted labor and was regularly monitored by sanctuary education staff. Dystocia was relieved on the 3<sup>rd</sup> day at this wildlife sanctuary. The giraffe was chemically immobilized by using 7mg of Etorphine Hcl (0.98%) (M99<sup>®</sup>) (Norvatis South Africa (Pty) Limited) and 50mg of Azaperone(10%) (Kyron Laboratories (Pty) Limited, South Africa) in a Dan-Inject dart (Dan-inject APS, Sellerup Skovej, Denmark). On obstetrical examination of the giraffe, a fetal malposition type of dystocia had occurred. The fetus was positioned at posterior presentation extended posture with tail butting on the maternal pelvis, which is abnormal in giraffes. The fetus was manually extracted by using both alternate and simultaneous limb traction. The dam survived the procedure and later was reported to be in a good reproductive condition but the male fetus was a stillbirth. The fetus had died due to stress of prolonged labour. Relief of dystocia in giraffes is a difficult obstetrical procedure because obstetrical examination and relief requires chemical immobilization plus physical restraint with ropes by trained staff. *Anesthesia* or immobilization of giraffes remains a challenge because of the giraffe's unique anatomy and physiology. Giraffes are large animals which limits physical control and manipulation at critical times during induction and recovery of anesthesia. Giraffe's long neck if not pinned to the ground will act as a lever causing fatal injuries to self and support staff. Giraffes develop elevated systolic blood pressure; have a small respiratory tidal volume with a large dead space and relatively small cardiac output during anesthesia, which compromises safe levels of anesthesia.

Key words: Giraffe, dystocia, manual extraction

### Introduction

The African Fund for Endangered Wildlife (AFEW), Giraffe Center, Nairobi manages a herd of Rothschild giraffes which are categorized as endangered in the International Union for Conservation of Nature (IUCN) red list of threatened species (Fennessy and Brennema 2010). The giraffes roam freely in a 100 acre fenced wildlife sanctuary in the suburban area of Nairobi. This herd of giraffe is sometimes fed with supplements and is habituated to visitors who occasionally try to feed them by hand. On the contrary these giraffes remain wild and aggressive and can kick if sloppily approached.

Successful management of dystocia in giraffes with survival of the mother and the baby giraffe is a rare occurrence. Lack of a standard facility and equipment for a cesarean section in the field conditions and

inherent anesthetic risk due to giraffe's anatomy and physiology further complicates management of dystocia in the species. Dystocia in giraffes has been documented previously by some authors (Ebedes, 1975, Citino *et al.*, 1984, Goslawki and Kolodziejska 1984). Survival of the mother giraffe after caesarian operation and a dead fetus has also been reported by Williams *et al.* (2007). Relief of dystocia in a zoo facility by zoo staff using rope snares when a dam was under no anesthesia has been reported by Hwan-Yul Yong *et al.*, (2009).

Relief of dystocia in a giraffe kept in a wildlife sanctuary by manipulation and traction under anesthesia with favorable outcome has not been reported. A single case of the same has been successfully handled by Kenya Wildlife Service staff at Soysambu ranch, Nakuru (Gakuya 2003).

## Materials and methods

Case clinical progression: On 25<sup>th</sup> June 2010 a 15-year old giraffe named Laura, from this sanctuary was reported to have shown signs of labour with no fetal membranes or parts seen. Blood tinged exudates were sighted on the ventral commissure of the vulva. She was straining, had decreased appetite and looked restless, anxious and isolated herself from the herd. On the 2<sup>nd</sup> day fetal membranes about 30cm long and fetal legs were seen hanging from the vulva. On 28<sup>th</sup> June 2010 there was no further progress and a decision was made to restrain the animal for obstetric examination and management.

Restraint: The giraffe was darted using 7mg of 0.98% Etorphine Hcl (M99<sup>®</sup>) (Norvatis South Africa (Pty) Limited) and 50mg of 10% Azaperone Hcl (Kyron Laboratories (Pty) Limited, South Africa) in a Dan-Inject dart (Dan-inject APS, Selerup Skovej, Denmark) on the shoulder muscles. The animal was darted on foot. Induction time was 10 minutes. During induction to down time, the animal ran into the bushes which posed a great challenge. Anesthesia was partially reversed immediately with 21mg of 1.2% Diprenorphine Hcl (Norvatis South Africa (Pty) Limited) given ¼ of the dose intravenously in the jugular vein and restrained physically using ropes. A blindfold was used to minimize stress, Opticlox<sup>®</sup> eye ointment (Norbrook laboratories Ltd) applied on the both eyes to prevent corneal drying and laceration. Clearing of the bushes was quickly carried out to facilitate access and handling of the giraffe. Complete reversal of anesthesia was achieved by using the balance of 15mg Diprenorphine administered intravenously and 50mg of 5% Naltrexone (Kyron Laboratories (Pty) Limited) injected intramuscularly to prevent re-narcotization.

Obstetrical examination and case management: Obstetrical examination revealed dead fetus on

posterior presentation with an extended posture. The tail was also butting on the pelvic brim (figure 1 and 2). Type of dystocia was a fetal malposition (fetal malpresentation) - a posterior presentation with an extended posture.

The fetus was retro-pulsed and realigned. Fetal skin was sloughing off. Manual extraction and manipulation of the fetus with the aid of ropes and liberal lubrication using liquid paraffin was carried out (figure 3 and 4). Fetal membranes were removed manually and Betamox<sup>®</sup> LA (Amoxicillin 15000mg) (Norbrook laboratories Ltd) administered intramuscularly. Samples were taken including placental caruncles for Brucella culture.

## Discussion

Wildlife clinical interventions are guided by sound principles governed by animal welfare and safety to staff. The right time to intervene in a dystocia case in relation to safety of the dam, baby giraffe and not the least staff, is critical in achieving a favorable outcome. Citino *et al.* (1984) has recommended that obstetrical examination be carried out after two hours of active parturition without noticeable signs of progress. Dagg and Foster (1982) supported this and stated that a giraffe calving should last between one and two hours. On the contrary Kristall and Noonan (1979) reported a parturition lasting approximately 15 hours, with no fetal protrusion shown during the first 14 hours but a healthy calf being born uneventfully. The practicability of intervention is dependent on the facilities available and other factors need to be considered (Williams *et al.*, 2007). Williams *et al.* (2007) has observed that if physical restraint of a giraffe is possible thus allowing for obstetrical examination to be carried out safely, then it is preferable to intervene sooner than later. Nevertheless if an examination is only possible through the use of



Figure-1: Fetal legs sighted



Figure-2: Obstetrical examination



Figure-3: Manipulation of fetus with liberal lubrication



Figure-4: Traction using ropes

chemical immobilization, then it may seem not preferable to rush to intervene.

According to Bush *et al.* (2002) giraffe's distinctive anatomy and physiology as described by Dagg and Foster (1976), presents inherent problems during anesthesia or chemical restraint include the following:

1. Their large size limits physical control during critical times of induction and recovery, and limits manipulation once the animal is down.
2. Their characteristic long neck, which if not controlled, acts as a lever arm creating danger to itself or the support staff. Solounias (1999) has proposed that the giraffe has actually eight cervical vertebrae contrary to the popular observation that all mammals have 7 cervical vertebrae. Mal-positioned neck leads to air way obstruction which is fatal. Burroughs *et al.*, (2006) have reported whip lash effect of the long neck resulting in head trauma. In addition to this the long hind and front legs can pose a danger to staff.
3. Improper choice of anesthetic drugs potentiates self induced injury due to slipping during induction and recovery.
4. Their tendency to vomit or regurgitate can lead to fatal aspiration pneumonia and the posterior position of the larynx in the pharynx hampers draining of any fluid (rumen and/or saliva).
5. Prolonged induction and/ or recovery leads to hyperthermia, myopathy, and secondary trauma. Giraffes usually develop elevated systolic blood pressure, has a small respiratory tidal volume with a large dead space (Hugh-Jones *et al.*, (1979) and relatively small cardiac output during anesthesia.

Posterior presentation (fetal hind extremity directed towards the maternal pelvis) is considered

(Benesch and Wright 1957) as abnormal in uniparous domestic species. More space is required for the hind limbs to undergo full extension than is the case with the fore. Therefore the longer the limbs the more complications can be expected (Devos, and Bourquin 1974). No other land mammal equals the size of the giraffe at birth (Hediger and Klages 1968). This is mainly due to the typically long legged build and elongated neck of the species. Posterior presentation must therefore be considered as abnormal in a giraffe. Prolonged labour may have resulted in fetal death and exhaustion of the dam. To rule out any infection a sample of fetal membranes containing caruncles was collected for culture.

The procedure took 20 minutes and the animal was successfully revived with good prognosis for survival and future breeding. This in our opinion contributed much to the favorable outcome. Our anesthesia protocol and duration was sound and practical. Vogelnest and Ralph (1997) reported similar protocols for giraffes to facilitate short procedures. The manual extraction of calves in cases of dystocia is a technique performed in daily practice, but there are divergent recommendations concerning the procedure (Mee 2004, Noakes 2001, Norman and Youngquist 2007).

Berker *et al.* (2010) have objectively supported the pulling of the elbows one at a time into the pelvic cavity and then extracting the fetus by applying traction to both limbs simultaneously in anterior presented bovine calves. This method of extraction keeps the traction forces to a minimum. We used alternate limb traction and later simultaneous limb traction with lots of lubrication which in our considered opinion works well. Tsousis *et al.* (2011) have carried an intensive study in extraction methods in bovine obstetrics. Giraffes remain delicate animals as they can easily succumb to self inflicted injuries,

and complications during and after anesthesia.

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