CASE REPORT

Comprehensive Management of Dental Calculus in a Meerkat (*Suricata suricatta*): A Case Report

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Meerkats (*Suricata suricatta*), small burrowing carnivores of the family Herpestidae, are endemic to the arid regions of the Kalahari and Namib Deserts across Botswana, Namibia, Angola, and South Africa. Although primarily insectivorous, wild meerkats supplement their diet with lizards, snakes, scorpions, spiders, plants, eggs, small mammals, millipedes, centipedes, and occasionally small birds. In captivity, they are typically fed high-quality feline kibble combined with insect prey (e.g. mealworms, crickets, waxworms, locusts) and fresh produce such as apple, carrot, sweet potato, banana, and pear (AZA Small Carnivore TAG, 2020).

Adult meerkats possess 36 permanent teeth with a dental formula of 2(I3/3, C1/1, P3/3, M2/2), characterized by sharp interlocking cusps adapted for carnivorous mastication (Hillson, 2005). Despite their hard, abrasive natural diet, captive meerkats are predisposed to periodontal disease due to the consistency of captive diets and lack of opportunities for abrasive chewing. Periodontal disease is a plaque-induced inflammatory condition affecting the supporting periodontal tissues (Perry and Tutt, 2015; Niemiec, 2013). Clinical signs include halitosis, dental plaque and calculus accumulation, gingival inflammation and bleeding, gingival recession, furcation exposure, and tooth mobility (Klein, 2000). Effective management requires mechanical removal of supra- and sub-gingival plaque to halt disease progression. This report presents a successful case of periodontal disease management in a captive meerkat through ultrasonic scaling under general anaesthesia and targeted postoperative care.

Case History and Observations

An adult male meerkat (1.16 kg) was presented with inappetence and episodes of aggressive behaviour. On clinical examination, the meerkat had a normal rectal temperature (36.5 °C) and capillary refill time (3 second), but was tachycardic and had pale mucous membranes, suggestive of anaemia. Oral examination confirmed extensive dental plaque and calculus on both the lingual/palatal and buccal surfaces of the premolar teeth, accompanied by marked halitosis and gingivitis.

A complete blood count and serum biochemistry panel were performed. The blood was processed in VetScan HM5 v2.61 machine. The results (Table 1) indicated a microcytic, hypochromic anaemia with reduced haemoglobin, thrombocytopenia, a slight neutrophilia, and an elevated BUN (67 mg/dL), findings consistent with mild renal insufficiency (Ramsay, 2015). These laboratory abnormalities corroborated the clinical observation of pale mucous membranes and suggested a concurrent chronic condition affecting the kidneys. Hence it was decided to go for ultrasonic scaling and systemic holistic treatment approach under general anaesthesia.

Table 1: Pre procedural haemato-biochemistry of the meerkat

Haematological Parameter	Value	Biochemical Parameter	Value
WBC (x103/µL)	9.91	ALB (g/dL)	2.10
LYM (x103/µL)	1.46	ALP (U/L)	57.00
NEU (x103/µL)	0.87	ALT (U/L)	34.00
EOS (x103/µL)	-	AMY (U/L)	654.00
BAS (x103/µL)	-	TBIL (mg/dL)	0.40
RBC (x106/µL)	8.15	BUN (mg/dL)	67.00
Hb (g/dL)	9.50	CA (mg/dL)	9.80
HCT (%)	30.15	PHOS (mg/dL)	5.30
MCV (fl)	37.00	CRE (mg/dL)	1.10
MCHC (g/dL)	31.40	GLU (mg/dL)	134.00
RDWc (%)	25.70	NA+ (mmol/L)	146.00
RDWs (fl)	33.60	K+ (mmol/L)	3.30
PLT (x103/µL)	230.00	TP (g/dL)	8.80
MPV (fl)	6.20	GLOB (g/dL)	6.70
PCT (%)	0.14	--	--

Treatment and Discussion

The meerkat was premedicated with butorphanol (0.2 mg/kg SC) to provide sedation and analgesia. Anaesthesia was induced with 5% isoflurane in 100% oxygen (flow rate 2 L/min) delivered via face mask. Upon achieving adequate muscle relaxation and loss of the righting reflex, the animal was intubated with a 2.5 mm uncuffed endotracheal tube. Anaesthesia was maintained with isoflurane at 0.6% (in oxygen) throughout the dental procedure. Physiological parameters were monitored and remained stable under inhalant anaesthesia.

The oral cavity was irrigated with 0.2% chlorhexidine solution prior to scaling to reduce oral bacterial load and minimise aerosolized microbes. Ultrasonic scaling of the teeth was then performed using both supragingival and subgingival scaler tips to remove the plaque and calcified tartar deposits. Each application of the ultrasonic scaler to a tooth surface was limited to 15 sec to prevent heat-induced damage to the pulp or surrounding tissues (Niemiec, 2013). The heavy calculus on the premolars and molars was systematically chipped away and flushed off. Intermittent water irrigation was used for cooling and flushing away debris. The entire scaling procedure was completed in approximately 8-10 min,

Fig. 1: Intraoral examination showing heavy brown calculus covering the lower premolars and inflamed gingival margins. The thick tartar buildup and gingivitis indicate advanced periodontal disease.

Fig. 2: The meerkat under general anaesthesia, positioned on the operating table for the dental procedure. An anaesthetic face mask and breathing circuit are in use to deliver isoflurane in oxygen.

Fig. 3: Ultrasonic scaling in progress under general anaesthesia.

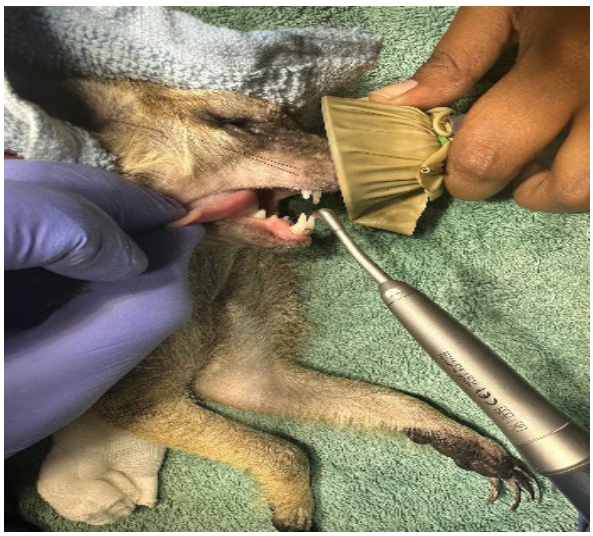

Fig. 4: Immediate post-scaling oral appearance. Mild gum redness is still evident.

after which the mouth was thoroughly flushed with sterile saline followed by a final rinse of 0.2% chlorhexidine.

At the conclusion of scaling, all visible plaque and tartar were removed from the teeth. The gingiva was inspected for any remaining inflammation or areas of bleeding. No extractions were necessary, as none of the teeth were loose or irreparably diseased once the calculus was cleared. The patient recovered uneventfully from anaesthesia after approximately 15 min of post-procedure oxygen and monitoring.

Post-procedural medications and supportive care were instituted to promote healing and address the underlying conditions. A long-acting antibiotic, cefovecin (8 mg/kg SC, single dose), was administered to control secondary bacterial infection of the periodontal tissues. Iron dextran (10 mg IM) was given to help correct the anaemia. Subcutaneous fluid therapy (balanced crystalloids) was provided for 3 days to support renal function and hydration. The meerkat was also given meloxicam (0.2 mg/kg PO once daily for 3 days, injected in feeder insect-superworm) for analgesia and anti-inflammatory effect, and an oral renal support supplement (Pronefra® syrup, 2-3 mL PO daily for 10 days) to aid in managing the mild renal insufficiency.

Fig. 5: Innovative oral medicating technique in a meerkat. Shown is a feeder insect (superworm) being injected with oral medication to encourage voluntary ingestion by the meerkat.

The meerkat recovered well following the procedure. It resumed eating voluntarily on the second day after the dental scaling, with a noticeable improvement in appetite and demeanour. Halitosis reduced progressively over the next few days as the oral infection and inflammation subsided. By approximately 8-10 days post-treatment, the gingival tissues had completely healed with resolution of redness and swelling, and no further bleeding was observed. The successful outcome was confirmed by the return of normal eating habits and behaviour, and the resolution of the initial clinical signs.

Importantly, this meerkat's periodontal disease occurred alongside renal insufficiency, consistent with the recognised bidirectional relationship between oral and renal pathology (Trevejo *et al.*, 2018; Hall *et al.*, 2021). The anaemia and elevated BUN suggested early renal dysfunction that likely intensified the gingivitis, highlighting the need to address oral and systemic disease together in such cases.

Ultrasonic scaling under inhalation anaesthesia was effective and well tolerated, allowing thorough calculus removal with appropriate precautions (chlorhexidine rinsing, endotracheal intubation, brief scaler contact with irrigation) to limit bacteraemia, aspiration and thermal injury (Niemiec, 2013). The uneventful recovery indicates that, when performed carefully, dental scaling is a practical and safe option for small exotic carnivores such as meerkats.

In general, this case illustrates the efficacy of prompt ultrasonic scaling combined with appropriate systemic therapy in resolving periodontal disease in a captive meerkat, and that proactive dental care not only improves oral health but also contributes to the overall wellbeing and longevity of captive meerkats.

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