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Diagnosis and surgical management of injured soft palate (*Dulla*) in dromedary camels (*Camelus dromedarius*)

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Abstract

The present study is a clinical report of 6 native dromedary male camels which suffered with the condition of injured *dulla* (*soft palate pouch*). All the affected cases were reported during rut season (November to March) with the signs of dysphagia, dyspnoea, extension of neck, painful retropharyngeal swelling and unable to inflate or extrude their *dulla*. The oral cavity of animals was examined and radiographs were taken to differentiate the condition from pharyngeal/oesophageal foreign body. Under xylazine sedation and Ketamine Hydrochloride anesthesia, soft palate was withdrawn for physical examination and on confirmation of condition surgical resection of soft palate was carried out. All the camels recovered uneventfully and started intake of water and soft feed just next day of the surgery.

Keywords: Camel, dromedary, rut, soft palate, resection

Introduction

The *dulla* is a unique diverticulum on the ventro-rostral part of the soft palate of the male dromedary camel (Hegazi, 1949; Mukasa-Mugerwa, 1981)^[7, 8]. It is extruded from the buccal cavity during the rut or under excitation (Arnautovic and Abdel Magid, 1974; Wilson, 1988)^[2, 10] and is commonly injured in adult male camels with their own teeth, or by biting of offender camel or by some external trauma. The injuries result in tear of mucosa and rupture of blood vessel of the *dulla*. In due course, the injured *dulla* remains either trapped at its normal position or its unable to retract in. In either case, the animal remains off feed and keeps neck stretched. The *dulla* becomes heavier due to haematoma and resultant infection due to trapping of feed straw in the *dulla*. In cases where *dulla* is trapped, adhesions develop and its further ballooning doesn't take place. If *dulla* hangs out, it daily increases in size due to pressure over blood vessels and resultant oedema. Sometimes, abscessation and gangrene of the part of *dulla* is also seen. Dysphagia is characteristic sign and dyspnoea may occur (Gahlot, 2000)^[4]. This clinical study is intended to provide details of the clinical findings of the injured *dulla* in camels and focus on its surgical management.

Materials and Method

The clinical study was performed on camels admitted to the Veterinary Clinical Complex, RAJUVAS, Bikaner, Rajasthan, India and diagnosed with soft palate injury. The case history, aetiology and clinical symptoms were recorded and lateral neck radiographs were taken wherever needed to differentiate the condition from the pharyngeal/oesophageal obstruction. The treatment was carried out by surgical resection of the affected soft palate in all the cases. The follow-up of the cases was done by contacting with camel owners through telephonic call. For confirmatory diagnosis and surgical treatment, the camels were restrained in sternal recumbency. Xylazine hydrochloride (@0.3 mg/kg body weight, i.v.) was first injected for sedation and anesthesia was induced with Ketamine hydrochloride (@ 2.5 mg/kg body weight, i.v.). After achieving proper depth of anaesthesia, the oral cavity was opened, irrigated by light potassium permanganate solution (0.001%) and completely examined for any abnormality. No oral cavity disorder was found in any of the case, hence the soft palate was extracted out by anchoring a long hook into its body in the cases of internally entrapped soft palate. On confirmation of soft palate injury, it was held in hand with towel, pulled out of oral cavity completely, and resected close to its attachment with the help of long handled Metzenbaum scissors.

Post-operatively, oral cavity was irrigated with light potassium permanganate solution and animal owners were also advised for the same up to few days. The animals were offered roughage diet with soft leaves without straws for next one week. Animals were administered antibiotic Oxytetracycline @ 5 mg/kg body weight intravenously for 5 days and analgesic Meloxicam @ 0.3 mg/kg body weight intramuscularly for 3 days.

Results and Discussion

Dulla injuries were classified into two categories, protrusion and entrapment. In present clinical study, protrusion was visualized in one case and entrapment was visualized in five cases. In these cases, haematoma, oedema and ulceration were visualized in 3 cases, abscessation in 2 cases and gangrene in 1 case.

In present study the common history of injured *dulla* was dysphagia and the other signs like stretching of neck and painful retro-pharyngeal swelling (Gahlot, 2000) [4]. In entrapped type, the *dulla* was unable to balloon out and in protruded type it stays hanging outside the mouth (Kohler-Rollefson *et al.* 2001). A camel with protruded *dulla* doesn't eat or drink, whereas a camel with entrapped *dulla* can drink but cannot eat (Kohler-Rollefson *et al.* 2001).

All the cases were presented during rut season (November to March) and camels have tendency to balloon out the *dulla* from the oral cavity and this leads to injuries of soft palate with sharp teeth, fight with other male camel (Al-Sobayil 2011) [1]. It has been also reported that injuries of *dulla* occur when male camels chase females for mating (Ramadan 1994) [9]. In the present study the protruded *dulla* was ulcerated, oedematous, and haematoma was present and the injuries of *dulla* cause tear to the mucosa and rupture of its blood vessels and the delayed treatment may lead to gangrene (Gahlot, 2000) [4].

In all the cases of entrapped *dulla*, a palpable and painful swelling at retropharyngeal region was observed. A long hook was used to pull out and then a towel was used to catch the pulled portion of the entrapped *dulla* (Gahlot, 2000) [4]. In all the clinical cases the soft palate was resected out carefully from the base using long handle Metzebeaum scissors. An inadequately cut stump may cause asphyxiation or death if it gets lodged into the laryngeal cavity (Gahlot *et al.*, 1988) [5]. The haemostasis was spontaneous and ligation of blood vessels was not required (Gharu *et al.* 2016) [6].

The surgical resection of the *dulla* was performed successfully in all the camels and there was no postoperative complication recorded. The recovery was uneventful and all the camels started normal water and food intake next day of the surgery.



Fig 1: Showing necrosed soft palate



Fig 2: Showing abs cessation and necrosis of soft palate

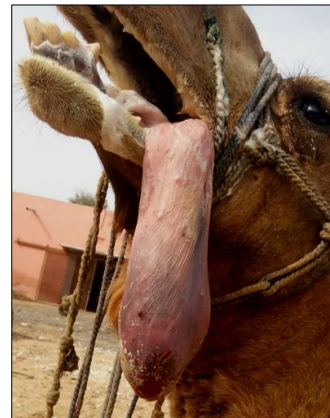


Fig 3: Protruded soft palate showing oedema and ulceration

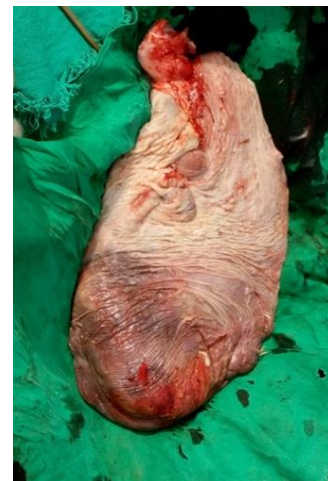


Fig 4: Resected soft palate showing haematoma and

Conclusion

Soft palate injuries are very common in mature camels during rut/breeding season as they have tendency to ballon out the *dulla*. The amputation of *dulla* has no effect on normal feeding of camels. The camel owners may observe the associated clinical signs of ruptured *dulla* and earliest treatment would be beneficial for the camel.

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