Resection of Entrapped, Over-Distended Soft Palate in a Male Dromedary Camel (Camelus dromedarius)

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Rec. Date: Nov 16, 2014 07:42  
Accept Date: Dec 08, 2014 09:26  
Published Online: December 14, 2014  
DOI 10.5455/ijlr.20141208092645

Abstract
A male dromedary camel was presented with clinical signs of dysphagia and dysponea due to entrapment of large, oedematous, haemorrhagic and overly distended soft palate (dulaa or gulaa) commonly occur during its rutting season. In order to maintain the patency of airway, complete ablation of distended soft palate was practised using deep sedation and local infiltration. Obligation of proper surgical techniques and maintenance of adequate postoperative measures rewarded with uneventful recovery.

Key words: Ablation, Soft palate, Gulaa, Camel

Introduction
The palatine diverticulum (dulaa or gulaa) is a distendable, heavily folded oro-ventral projection from the soft palate, exclusively seen in male dromedary camel (Camelus dromedarius) (Arnautovic and Abdel Magid, 1974; Smuts et al., 1987; Reece & Chawla 2001; Siddiqui and Telfah, 2010; Al-Sobayil & Ahmed; 2011). Comparatively, it is more developed in adult males than females and is protruded frequently with a peculiar gurgling sound during rutting season, i.e. November to March in northern India, corresponding to heightened sexual behaviour (Higgins and Kock 1986; Wilson, 1988; Reece & Chawla, 2001; Siddiqui and Telfah, 2010; Al-Sobayil & Ahmed; 2011). The exact mechanism of distension of the dulaa is not well understood. However, it has been assumed that the dulaa distends during expiration when the camel closes its nares and air is forced from the lungs into the oro-pharynx to inflate the soft palate (Arnautovic and Abdel Magid, 1974; White, 1986; Wilson, 1988; Reece & Chawla, 2001; Siddiqui and Telfah, 2010; Al-Sobayil & Ahmed; 2011). The dulaa is commonly got injured during a tussle between the adult male camels. Their sharp canines and/or molars cause perforation of the soft palate wall, causing submucosal haemtoma, necrosis, gangrene, food impaction leading to characteristic signs of dysphagia and dysponea. (Gahlot et al., 1988; Gahlot, 1993; Ramadan, 1994; Gahlot, 2000; Al-
Sobayil & Ahmed; 2011). Therefore, surgical ablation of the indignant dulaa has been described in few cases (Gahlot et al., 1988; Ramadan, 1994) to increase the maximum oxygen uptake with overall improvement of camels’ track performance.

**Case History and Clinical Observations**

About 10 years old male dromedary camel used for draught purposes in Chomu, Jaipur (Rajasthan, India), was presented in the month of January 2014 with a large, oedematous, haemorrhagic mass, distending from the roof of the mouth, occluding the throat region (Fig.1). The owner affirmed that the animal had been showing typical signs of rut. Upon close examination, diagnosis of overly distended soft palate was made. This distension had been evident for 15 hours before presentation along with clinical signs of dysphagia and dyspnoea along with gross findings like perforation, trauma and haemorrhages (Fig. 2) of dulaa, which were evidenced after the mass was pulled out. A decision was made to ablate the distended part in order to relieve airway occlusion.

**Fig.1:** Photograph showing entrapment of large, oedematous, lacerated soft palate mass in the throat region of the male camel

**Fig. 2:** Photograph showing an exteriorized lacerated, traumatized and haemorrhages of soft palate in a male camel after being pulled out with the help of long iron blunt hook
Treatment and Discussion

As the procedure had to be conducted under field conditions without any application of general anaesthesia, the animal was physically restrained in sternal recumbency and deeply sedated by intravenous administration of 10 ml xylazine (Xylaxin®; Indian Immunologicals Ltd). Pre-emptive antibiotic (60 ml Oxytetracycline®; Zydus AHL) was administered slowly through intravenous route. Also before surgery, non-steroidal anti-inflammatory drug 20 ml meloxicam (Melonex®; Intas Pharmaceutical Ltd) was administered intramuscularly. After attainment of sedation, the external jugular vein was catheterised and approximately 5 litres of normal saline was administered intra-operatively. The animal’s mouth was opened by an assistant after application of a rope each at upper and lower jaw followed by pulling out the entrapped dulaa with the help of long handle blunt iron hook (Fig. 2). The affected area was washed with potassium permanganate solution (0.001%). 20 ml of 2% Lidocaine (Xylocaine®; Astra Zeneca Ltd) local anaesthetic solution was infiltrated at the base of the distended pedicle. The local anaesthetic solution was infiltrated as caudally as possible, safely. After 10 minutes, the tongue was pulled out and the distended pedicle of soft palate was resected laterally from both the sides starting from the rostro-dorsal attachment with a long handle Mayo scissors up to the caudal most attachment. Otherwise an inadequately cut stump which might be sucked into the laryngeal cavity to cause death by asphyxia (Gahlot et al., 1988). As shown in figure 3, haemorrhage was minimal which might be due to the prolonged tension on the distended palatine vessels; hence no sutures were applied (Reece & Chawla, 2001).
The animal was recovered within 60 minutes after the onset of sedation. Post-operative care consists of irrigation of oral cavity by lukewarm potassium permanganate solution (0.001%), antibiotic (60 ml Oxytetracycline®, Zydus AHL) and analgesic (20 ml meloxicam, Melonex®, Intas Pharmaceutical Ltd) cover for 5 days. Food was withheld for first 18 hours; followed by maintenance of animal on succulent green feed and molasses solution for 3 weeks.

During re-examination after 3 weeks, there was little evidence of the trauma to the soft palate could be seen. Occasionally, the camel was observed to make a previously un-noticed, high pitched peculiar squeaking sound, earlier reported by Reece & Chawla (2001). The camel recovered uneventfully and was permitted to return to its normal draught duties.

References