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Surgical management of deep transverse tongue lacerations in cattle

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Abstract
The tongue is a highly motile, vascularized and muscular structure in bovine and is prone for injury due to indiscriminate and greedy feeding behavior. Common cause of tongue laceration in bovine is injury caused by sharp objects. A total of six cases presented to Veterianary Hospital, UAS Dharwad with protruded tongue, blood tinged excessive salivation having deep lacerated wound on the anterior part of the tongue were taken for the study. Tongue lacerations were surgically corrected in five cattle under Xylaxine hydrochloride sedation @ 0.1 mg/kg BW IM and local infiltration of 2% Lignocaine hydrochloride. The mouth gag was applied and palm grip was used at the base of tongue both as a tourniquet and also to hold and pull the tongue out to suture by absorbable suture material (Chromic catgut or Polyglactin - 910). Both horizontal mattress and simple interrupted suture techniques were used during surgery. Post-operatively, antibiotics, analgesics and Vitamin B-complex were given. The owner was advised for offering soft feed. Five animals recovered quickly as healing of the tongue was very rapid due to high vascularity and one animal was culled due to complete transection of anterior half of tongue.

Keywords: surgical management, deep lacerated tongue, cow

Introduction
The tongue is a highly motile, vascularized and muscular structure in bovine which serves as a primary organ of food prehension and rumination. It is also involved in the deglutition reflex, vocalization, self grooming and lapping (Ducharme *et al.*, 2017) [3]. Common cause of tongue laceration in bovine is injury caused by sharp objects like thorns, nails, wires, needles or sharp teeth (Vani, 2012) [8]. Most tongue lacerations are on the anterior dorsum of the tongue and they may be superficial, deep or involve loss of portion of organ. Individual cases of tongue lacerations in cattle due to the foreign body trauma and their successful surgical management have been reported (Vani, *loc. cit*., Jena, *et al*., 2017, Sangwan *et al*., 2017 and Aher *et al*., 2018) [4, 6, 1]. Tongue problems are very dangerous to the health of animal because they cause dysphagia, weight loss and in turn production loss (Wilson and Anthony, 2007) [9]. The clinical signs of laceration may include oral haemorrhage, hyper salivation, open mouth and hanging of tongue from mouth (Radostits *et al.*, 2007) [5]. The goals of tongue laceration repair are to attain adequate closure, minimize complications, preserve motility, optimize articulation and deglutition (Sangwan, *et al., loc. cit.*).
This article puts on record and describes successful surgical management of deep transverse tongue lacerations in five adult cattle.

Case history and treatment
A total of six cases were presented to Veterinary Hospital, University of Agriculture Sciences, Dharward, Karnataka with history of injury to tongue due to sharp objects and exhibiting signs of copious haemorrhagic ptyalism, halitosis and dysphagia. On clinical examination, five animals had varying degrees of full thickness tongue laceration and one animal had complete transaction of anterior half of the tongue. Details are given in Table - 1.
Surgical repair of tongue lacerations was taken up in four animals under Xylazine HCl sedation @ of 0.1mg / Kg BW. Local anaesthetic 2% Lignocaine HCL was infiltrated locally all along the lacerated wound edges in order to desensitize the site of operation. After sedation, animal was secured in standing position or lateral recumbancy and mouth gag was used to open the oral cavity. The full hand palm grip was used at the base of tongue both as a tourniquet and also to hold and pull the tongue out as much as possible.

The wound margins of lacerated tongues were surgically debrided of necrotic and contaminated tissues. Suturing was performed either using Catgut No. 2 / Polyglactin – 910 No 1-0 in horizontal mattress suturing pattern involving both sides of lacerated wound edges both on the dorsal and ventral surfaces. Then wound margins were reinforced with simple interrupted sutures in between the horizontal mattress suturing pattern (Fig. 2, 4, 6, 8 and 10). In the animal with complete transaction of the tongue, no suturing was done as the wound was six days old and there was complete inability to take feed inside the oral cavity on it's own. It was advised for culling the animal (Fig. 11).

Postoperatively, Antibiotic (inj. Streptopenicillin @ 10,000 IU / Kg B. Wt.) and Analgesic (Meloxicam @ 0.5 mg / kg B. Wt.) were administered for 7 days and 3 days respectively to all the animals. Supportive therapy of Vitamin B- complex, A, D and E was administered on alternative days for four times. Oral cavity was lavaged with diluted povidone iodine solution followed by application of Boroglycerine paste thrice daily.

All the animals were kept off feed for first three days, were offered ad libitum rice extract, jaggery and salt mixed water. The intravenous fluid therapy (Inj. DNS, 3 lit. + Inj. Rintose 2 lit.) was administered during this period to overcome dehydration and avoid use of tongue. Then owner was advised to feed soft rice gruel and very finely chaffed green fodder for next ten days. Two weeks later the owner reported normal prehension by the animal. The owner informed that mucosal sutures got removed by the cow itself through tongue movement.

Discussion

Tongue lacerations in cattle are associated with the indiscriminate and greedy eating habit, oral prehension and suckling habits on sharp objects in their environment such as barbed wire, needles, and thorns (Jena, *et al*., *loc. cit.*). As tongue is a prehensile organ of bovine and its laceration require immediate attention to preserve its integrity and facilitate primary healing. Most minor lacerations heal without surgical intervention by using daily mouth lavage, medicinal treatment and by feeding a soft diet, however in severe cases that involve body of the tongue are best managed surgically. The decision to suture a tongue laceration depends on the size of the laceration or the gaping nature of the wound. Complex lacerations are those that involve large flaps, active bleeding or through-and-through injuries of the tongue and are more likely to require repair. Performing tongue assessment is best when the tongue is at rest inside the mouth as this is the most common position, as opposed to protruding outside the mouth. The suture used requires tensile strength given the mobility and tension it will experience as part of normal tongue function. A literature review showed the use of Polyglactin-910 (Sangwan, *et al., loc. cit*.) and Chromic gut (Vani, *loc. cit*., Jena, *et al*., *loc. cit*. and Aher *et al*., *loc. cit*.) in horizontal mattress pattern as most common. In the present study, suturing was performed either using Catgut No. 2 / Polyglactin – 910 No 1-0 in horizontal mattress suturing pattern involving both sides of lacerated wound edges. Then wound margins were reinforced with simple interrupted sutures in between the horizontal mattress suturing pattern. These sutures ensured obliteration of the dead space and proper apposition of the lingual mucosa on the dorsal and ventral surfaces. This method of tongue laceration repair was found to be good with no dehiscence as it reduced the chances of food particles entering inside. Sutures were placed to approximate edges, but tied loose enough to allow for swelling and prevent tissue necrosis. Early surgical repair of tongue laceration results in rapid healing by primary intention while ensuring least amount of deformity and conformation because of good blood supply (Tyagi *et al*., 1993 and Jena, *et al*., *loc. cit*) [7]. The lacerated wound in our study was healthy and portion of hanging tongue encouraged attempting repair rather than amputation. Shortening or contracture of free rostral part of tongue in cow following laceration repair has been reported by Davidson *et al*. (1981) [2] but no such complication was observed in our case. Deep lacerations of the tongue in cattle were successfully managed surgically resulting in rapid healing of the tongue. It may be due to good vascularity. Similar observations were made by Aher *et al*, *loc. cit*. In conclusion, it is rewarding to repair tongue laceration in cattle under sedation and local infiltration anaesthesia which may be attempted in field conditions.

Table 1: Details of cattle with tongue lacerations presented to veterinary hospital, UAS Dharwad

Patient No.	Animal details			Cause of injury	Site and extent of injury
	Breed	Age	Gender		
1	Non descript	6	Male -bullock	Licking of manual fodder chopping equipment	Complete width of tongue's dorsal surface is cut and from right lateral edge ventral surface is also cut (Fig. 1).
2	Hallikar	8	Male - bullock	Licking barbed wire	Full thickness of tongue is cut on left lateral edge upto 1/2 of the width running perpendicular to lateral margin (Fig. 3).
3	Hallikar	6	Male - bullock	Licking sharp glass	Full thickness of tongue is cut on left lateral edge up to 1/2 of the width on dorasal side and 2/3rd on ventral side running perpendicular to lateral margin (Fig. 5).
4	HF- Deoni cross	7	Female - cow	Licking barbed wire	Full thickness of tongue is cut on left lateral edge running obliquely towards centre along the left lateral margin (Fig. 7).
5	Jersy cross	8	Female - cow	Licking tin sheet	Full thickness of tongue is cut on left lateral margin along the left lateral margin, moving obliquely toward midline of tongue (Fig. 9).
6	Khillar	8	Male bullock	Sickle kept in the fodder stack.	Complete loss of anterior 1/2 of the tongue (Fig. 11).

Fig. 1: Patient No. 1: Complete width of tongue's dorsal surface is cut and from right lateral edge ventral surface is also cut in a non descript bullock.

Fig 2: Patient No. 1: Tongue repair with horizontal mattress suture reinforced with simple interrupted suture pattern using Chromic catgut no 2 (Dorsal surface).

Fig 3: Patient No. 2: Full thickness of tongue is cut on left lateral edge upto 1/2 of the width running perpendicular to lateral margin in a Hallikar bullock.

Fig 4: Patient No. 2 : Tongue repair with horizontal mattress suture reinforced with simple interrupted suture pattern using Chromic catgut no 2 (Dorsal surface and ventral surface).

Fig 5: Patient No. 3 : Full thickness of tongue is cut on left lateral edge up to 1/2 of the width on dorasal side and 2/3rd on ventral side running perpendicular to lateral margin in a Hallikar bullock.

Fig 6: Patient No. 3 : Tongue repair with horizontal mattress suture reinforced with simple interrupted suture pattern using Chromic catgut no 2 (dorsal surface and ventral surface).

Fig 7: Patient No. 4 : Full thickness of tongue is cut on left lateral edge running obliquely towards centre along the left lateral margin in a H. F. Deoni cross cow.

Fig 8: Patient No. 4 : Tongue repair with horizontal mattress suture reinforced with simple interrupted suture pattern using Chromic catgut no 2 (Dorsal surface and ventral surface).

Fig 9: Patient No. 5 : Full thickness of tongue is cut on left lateral margin along the left lateral margin, moving obliquely towards midline of tongue in a Jersy cross cow.

Fig 10: Patient No. 5 : Tongue repair with horizontal mattress suture reinforced with simple interrupted suture pattern using Polyglactin – 910 (Dorsal surface and ventral surface).

Fig 11: Patient No. 6 : Complete loss of anterior 1/2 of the tongue in a Khillar bullock.

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