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MANAGEMENT OF PAROTID SALIVARY GLAND AFFECTIONS IN BOVINES

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ABSTRACT

The present study was conducted on 24 clinical cases of parotid gland affections i.e. ectasia, sialocele, salivary fistula, parotiditis and tumour in cows (n=10) and buffaloes (n=14). Ectasia, sialocele and fistula were treated by ligation of Stenson's duct and destruction of parotid salivary gland using counter-irritant. The cases of parotiditis and tumour were managed by medicinal/palliative treatment. Animals recovered eventless except for tumour cases.

Keywords: Ectasia, fistula, parotiditis, parotid gland, salivary gland, sialocele, Stenson's duct, tumour.

The salivary glands produce and secrete saliva, a fluid that assists in the initial activities of digestion. Parotid salivary gland may be palpated as a firm structure just behind and medial to the caudal border of the vertical ramus of the mandible. Stenson's duct is most vulnerable for obliteration and trauma causing ectasia, sialocele and fistula formation in ruminants. The Stenson's duct emerges from the distal extremity of the gland and courses forward along the ventral border of the masseter muscle, then turns upward and gains the rostral border of the muscle. After a short course, the duct opens into the buccal vestibule at the parotid papilla (Barnwal and Sinha, 1982). The occlusion of the Stenson's duct by a foreign substance like rumen cud, grass spikes, awns, cell eruptions, plaques, blood clots and sialolith etc. at its oral opening results in ductal engorgement (Joshi *et al*, 2003). Ectasia of the parotid duct, salivary fistula, sialolith, sialocele inflammation and tumour of the parotid glands were documented as common affections in ruminants (Bundza, 1983; Misk and Nigam, 1984; Misk *et al*, 1991; Semieka, 2002; Misk *et al*, 2014). A direct trauma from outside to the duct or an abscess formation in the region may cause the salivary fistula (Singh *et al,* 1993; Sagliyan *et al,* 2009). Since ruminants produce a large quantity of saliva, the huge loss of fluid through fistula needs immediate correction to combat dehydration and infection (Fubini and Ducharme, 2004). The present report documented the diagnosis and surgico-therapeutic management of various affections of parotid salivary glands in bovines.

Table 1. Various affections of parotid glands in bovines.

Affections	Cow	Buffalo	Total
Ectasia	4	2	6
Sialocele	1	2	3
Fistula	2	3	5
Parotiditis	1	2	3
Tumour	2	5	7
Total	**10**	**14**	**24**

History and clinical examination

The parotid glands affections were recorded in 24 cases, out of which 10 were adult cows and 14 adult buffaloes. All animals were female except for one bullock suffering with salivary fistula.

Ectasia

Ectasia of the parotid duct was diagnosed in 6 animals, out of which 4 were cows (Fig 1, 2) and 2 were buffaloes (Fig 3) with elongated soft fluctuating swelling in course of the Stenson's duct. Exploratory puncture revealed the presence of saliva. After the complete evacuation, the refilling was rapid attaining status quo within 3-5 minutes.

Sialocele

Sialocele was diagnosed in 3 females; out of which 1 was cow and 2 buffaloes (Fig 4) showing the oval-shaped soft fluctuating non-painful swelling on the lower aspect of the mandible. Exploratory puncture of the swelling revealed the presence of serous fluid. Appetite and general appearance of these animals were found normal. After

complete evacuation of the swelling, it remains as it is and it took 1-2 hours for complete refilling of the swelling.

Salivary fistula

It was diagnosed in 2 cows (one each of either sex) and 3 female buffaloes (Fig 5) showing a firm, non-painful swelling with serous fluid discharge on the right side of the face just ventral to the zygomatic arch with the history of trauma and refractory to medicinal treatment. The opening was surrounded by hard fibrous tissue and drained clear viscous fluid. In a Bullock and a buffalo, the owner reported the development of hard swellings on ventral border of the right mandible which was gradually increased in size since last 3-4 months and 20 days back with a discharge of clear transparent viscous fluid. Continuous leakage of this fluid from the opening was being observed since then. The fluid was diagnosed as saliva. The diagnosis was established depending on the presence of an opening along the course of the parotid duct discharging saliva. The surgical intervention to repair the fistula was contemplated.

Parotiditis

Animals were presented with a painful swelling at the parotid region in 1 cow and 2 buffaloes with history of the traumatic episode at affected gland in the cow. It was unilateral in cow while bilateral in buffaloes. The body temperature was slightly higher than normal.

Tumour

Two cows and 5 buffaloes were presented with a history of hard swelling in the parotid gland area (Fig 6). The swelling began approximately 1-2 years before and increased gradually, causing difficulty in swallowing, drooling, and weight loss. On clinical examination, the swelling was hard in consistency, immovable and painless. The swelling of the submandibular lymph node was also observed. The other clinical parameters were within normal limits.

Treatment and Discussion

Generally, salivary gland duct obstructions resulting ectasia, sialocele and fistula occur unilaterally. Therefore, treatment mainly focuses to destroy the affected gland and correcting a cosmetic defect, because the effect on digestive activity from unilateral loss of saliva is inconsequential (Fubini and Ducharme, 2004). Aspiration of the swelling may conûrm its diagnosis if saliva is present, it may also result in contamination and secondary infection. Choosing an appropriate technique is important to treat parotid salivary gland and duct affections. Presently available options include a total parotidectomy, end-to-end anastomosis over a stent, parotid duct transposition, and proximal parotid duct ligation (Misk *et al*, 2014).

Animals suffered from ectasia, sialocele and fistulas were treated by ligation of ducts and chemical destruction of the affected parotid gland. These animals were routinely prepared for aseptic surgery (Fig 7). Animals were sedated by the administration of xylazine hydrochloride @ 0.05 mg/kg B wt IM. Local analgesia was achieved by infiltration of 8-10 ml of 2% Lignocaine HCl on the operative site. A 5-6-cm long linear incision, parallel to the parotid salivary duct, was made on the skin directly over the swelling in the course of the Stenson's duct in case of ectasia and sialocele, while 3-4 cm caudal to the fistulous opening in case of the salivary fistula. The Stenson's duct was identified as ballooned tortuous in case of ectasia, while no such connection was observed in sialocele. In case of the salivary fistula, the duct was traced-out posterior to the fistulous opening. The thickened proximal segment of the duct was identified in these cases. Stenson's duct was dissected carefully to avoid damage to the accompanying veins and arteries (Fig 8). The wings and needle of the scalp vein set were cut out and the remaining portion was used as a catheter. This modified scalp vein set catheter was passed inside the engorged duct towards the parotid gland and circumferential ligation of the duct enclosing the catheter in the duct using vicryl no 1. About 8-10 ml of Tincture Iodine solution was infused inside the tube towards the gland (Fig 9). The ligature was tightened after withdrawing the catheter. Then the subcutaneous tissue was sutured by vicryl no 1. The skin was closed routinely with silk sutures in interrupted horizontal mattress suture pattern (Fig 10). Postoperatively, there was no leakage of the saliva from the operative site (Fig 11). Postoperatively, broad-spectrum antibiotic and analgesic were administrated for five days. The skin sutures were removed on 12^{th} postoperative days. No recurrence of the condition was reported after the surgery.

Parotid salivary duct runs mostly subcutaneously along its course and more prone to damage by external trauma leading to ectasia, sialocele and fistula formation (Misk *et al*, 2014). Chronic obstruction of the parotid duct may lead to ectasia and formation of a cystic swelling at one side of the head. However, the presence of parotid



Fig 1. Ectasia of parotid salivary duct showing large swelling in course of the duct.



Fig 2. Ectasia of parotid salivary duct showing large swelling in course of the duct.



Fig 3. Exploratory puncture of the swelling revealed presence of saliva in the case of ectasia of parotid salivary duct.



Fig 4. Fluid filled swelling on lower aspect of the mandible indicating sialocele in buffalo.



Fig 5. Fistulous appearace on ventral border of mandible.



Fig 6. Parotid salivary gland tumour in a buffalo.



Fig 7. Showing fistulous opening at left mandible.

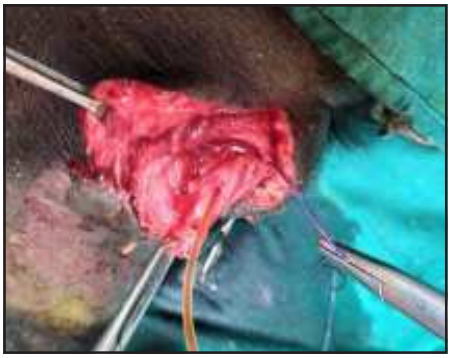


Fig 8. Introducing of the polyethylene tube into the distal part of the salivary duct.



Fig 9. Proximal parotid duct ligation and infusion of the tincture iodine solution using mudified butter fly set.



Fig 10. Finished appearance of surgical site after salivary fistula repair.



Fig 11. Post operative appearance of surgical site. No leakage of the saliva.

duct ectasia in calves may have a congenital link (Misk *et al*, 1991). Parotid fistula can be corrected either by simple duct ligation, destruction of the gland, resection of the duct, repairing of the duct or marsupialisation. It is technically difficult to remove the parotid gland completely because of the proximity of the salivary gland to important neurovascular bundles (Fubini and Ducharme, 2004). The incidence of recurrence in the case of marsupialisation or creation of intra-oral new stoma is high because the created stoma may close or due to stricture (Fubini and Ducharme, 2004). Destruction of the gland may be done by the retrograde injection of counter-irritant (eg. Tincture of iodine) or a caustic agent into the parotid duct or direct injection in the gland but a repetition of injection may be necessary and the destruction of the gland causes discomfort (Schmotzer *et al*, 1991, Gahlot *et al*, 2004; Purohit *et al*, 2005). The parotid glands of adult ruminants secrete huge amount of alkaline saliva rapidly and continuously. The rate of secretion increases during feeding and rumination (Fubini and Ducharme, 2004; König and Liebich, 2004). It was reported to be in normal health for 3-5 years post- ligation. Withholding the contribution of the single parotid gland or unilateral inactivation in the case had no clinical effect on the bullock as also reported by Fubini and Ducharme (2004); Maji and Samanta (2014).

A sialocele commonly results from parotid salivary duct rupture secondary to sialolithiasis or blunt trauma, although injury of a parotid salivary duct does not necessarily cause a sialocele (Vallefuoco *et al*, 2011). Saliva on exploratory puncture of swelling and fistula should be considered as an important clinical symptom of sialocele and parotid salivary duct rupture.

Successful parotid duct ligation has been assessed based on no fluid production and no evidence of swelling (Harvey, 1977). The swelling lasted for 2 weeks and was reduced 3 weeks postoperatively without further medicinal treatment. Complete ligation of the parotid duct has been described, leading to atrophy of the glandular tissues (DeYoung *et al*, 1978). Swelling secondary to saliva retention in the parotid salivary gland could be possible until the gland starts to be atrophied and cease production of saliva.

Parotiditis

Mild to moderate swelling on the parotid gland region was observed. The cases of parotiditis were medicinally managed. Apart from a viral infection, other infections, such as bacterial, can cause parotitis. Acute infections of the salivary gland usually present with rapid onset of pain and swelling of the affected gland (Bhikane *et al*, 2002).

Tumour

Neoplastic lesions of the parotid salivary gland can either be benign or malignant. Within the parotid gland, nearly 80% of tumours are benign (Mehanna *et al*, 2012). Benign lesions tend to be painless, asymptomatic and slow-growing. Salivary gland tumours (SGTs) in farm animals are rare. Adenoma and carcinoma occur occasionally in cattle (Valentine, 2004; Lucena *et al*, 2011; Queiroz *et al*, 2018). Tumours result in ûrm swelling of the affected gland. In cattle, metastasis to local lymph nodes can occur. The SGTs affects mainly older animals (Head *et al*, 2002; Uzal *et al*, 2016). The cows and buffaloes of the present study showed a progressive increase in volume in the right parotid region, difficulty in swallowing, drooling and weight loss. The progression of clinical signs occurred slowly since the owner claimed to observe the changes in the first two years. The most common clinical signs of SGTs are a gradual increase in volume and/or the presence of a painless mass in the region of the salivary gland (Mazzullo *et al*, 2005). These tumours were diffuse and surgical excision was not practically possible. Owner advised for chemotherapy to prevent further increase in the tumour mass and complications. A case of actinobacillosis in the salivary gland has been described in a heifer of Iranian Holstein breed (Bazargani *et al*, 2010). Salgado *et al* (2012) diagnosed adenocarcinoma of the parotid salivary gland in a cow. In conclusion, the cases of ectasia, sialocele and fistula can be treated by ligation of Stenson's duct and chemical destruction of the parotid salivary gland while parotitis and tumour can be managed medicinally.

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