

MODIFIED VULVAL TRUSS TECHNIQUE TO PREVENT RECURRENCE OF CERVICO-VAGINAL PROLAPSE IN WATER BUFFALOES

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ABSTRACT

A retrospective study was conducted in a total of 89 water buffaloes reported with cervico-vaginal prolapse (CVP) in various degrees and were initially examined for their physiological and haematological parameters. The affected buffaloes were classified into 3 groups based on the degree of CVP and were treated with 8 'R' principles and as a recurrence prevention strategy, they were managed with modified conventional vulval truss method, vulval retention suture method and both in all the three groups. The buffaloes handled with modified conventional vulval truss method showed reduced straining, genital injury and no obstetrical complications. The buffaloes treated with vulval retention suture showed mild straining, wound around the sutured site and those buffaloes treated with both modified conventional vulval truss method and vulval retention suture showed relatively effective results. Based on this study, it is concluded that the buffaloes affected with any degree of CVP and treated with modified conventional vulval truss method showed effective recurrence prevention with relatively no swelling, straining, haemorrhage, injury, maggot wound and

postpartum obstetrical complications.

Keywords: *Bubalus bubalis*, buffaloes, cervico-vaginal prolapse, modified vulval truss method, recurrence prevention, water buffaloes

INTRODUCTION

Cervico-vaginal prolapse (CVP) during prepartum period in buffaloes is considered as one of the major reproductive problem and emergency case causing great economic loss to dairy farmers (Selvaraju *et al.*, 2019). Protrusion of the portion of the floor, lateral walls, and roof of vagina through vulva with the caudal movement of cervix and uterus were noticed in CVP (Manokaran *et al.*, 2014). In CVP, there is an eversion of vagina and cervix over caudal attachment, then from the vulvar commissure protrude outside and finally the inside layer remains out (Whittier, 2007) Any delay in attending or improper handling of CVP may lead to edema, ischaemia, laceration, haemorrhages, and shock, resulting in death of the buffalo (Manokaran *et al.*, 2012; Selvaraju *et al.*, 2019). Factors responsible for the occurrence of

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CVP include calcium deficiency or altered calcium and phosphorus ration, deficiency of selenium, chronic infection causing continuous irritation of genital (Parikh *et al.*, 2018). CVP mainly occurred in the last trimester of pregnancy when placental estrogen production increased. The enhanced production of estrogen induced relaxin secretion which led to relaxation of the pelvic ligaments and adjacent structures, ultimately resulted in edema and relaxation of the vulva and vulvar sphincter muscles. Further, some buffaloes showed greater relaxation of the pelvic organs near fetal delivery, and with elevated abdominal pressure, the relaxed vagina and the bladder prolapsed through the vulva (Kumar *et al.*, 2018). Various predisposing factors are responsible for prolapse of vagina could be listed as, hypocalcaemic atony, open cervix, weak pelvic ligaments, and abdominal straining (Wolfe, 2009; Kumar *et al.*, 2018).

Initial management of CVP including reduction of prolapsed cervix and vagina and reposition remains same as described under uterine prolapse management (Purohit *et al.*, 2018), however a surfeit of techniques has been described for retention of CVP including Buhner's suture (Roberts, 1971), boot lace sutures, vaginopexy (Wolfe and Carson, 1999), modified Minchev's method (Napoleon *et al.*, 2018), and trans-vaginal cervicopexy (Meisner and Anderson, 2008). These techniques are invasive techniques and used to maintain position of the vagina cranial to the vulva and preferably within the vaginal canal. These sutures are kept in place for 30 to 45 days to stimulate extensive fibrous adhesions, which paves as mainstay to the vaginal vault. These techniques mostly resulted in persistent straining and recurrent prolapse results in tearing of the vulva (Wolfe and Carson, 1999). The farmers and the milkmen in and around the Namakkal District,

Tamil Nadu, India usually adopt a non-invasive vulval truss technique using old dhoti or sarees (old and used dress materials) to prevent CVP in cows and buffaloes without proper scientific approach and follow up. Although the technique is found to be effective in preventing recurrence CVP, many buffaloes exhibited complications such as straining, purulent vaginal discharge, uneasiness etc., and therefore, this technique was modified by the authors using cotton ropes and applied in CVP affected buffaloes. Hence a retrospective case study was conducted in water buffaloes (*Bubalus bubalis*) to assess the effectiveness of non-invasive modified conventional method of vulval truss after the reduction of CVP and compared with other recurrence prevention strategies.

MATERIALS AND METHODS

Selection of experimental animals

A total of 89 graded Murrah water buffaloes from January 2012 to May 2020 which were brought to the Obstetrics unit, Veterinary College and Research Institute, Namakkal, Tamil Nadu, India with prolapse of vagina and cervix were selected. Based on the condition of prolapsed amss, the buffaloes were grouped as Group 1, First degree CVP (Figure 1) containing 31 buffaloes (7 primiparous; 24 pleuriparous), Group 2, Second degree CVP (Figure 2) consisting of 34 buffaloes (9 primiparous; 25 pleuriparous) and Group 3, Third degree CVP (Figure 3 and Figure 4) comprising of 24 animals (6 primiparous; 18 pleuriparous). All the buffaloes were examined clinically for physiological parameters *viz.*, temperature, pulse rate, respiratory rate and haematologically for haemoglobin (Hb), Packed Cell Volume (PCV) and differential count (Table 1). Group 1 (First degree

Table 1. Physiological Parameters in buffaloes affected with cervico-vaginal prolapse.

S. No.	Parameters		Group I (First degree)	Group II (Second degree)	Group III (Third degree)	Percent (%)
1.	No. of animals		31	34	24	
2.	Primiparous		7	9	6	24.71
3.	Pleuriparous		24	25	18	75.28
4.	Degree of prolapse		1 st	2 nd	3 rd	
5.	Gestational age	6-8 months	1	7	3	12.35
		8-9 months	14	9	6	32.58
		9 months to term	16	18	15	55.05
6.	Rectal temperature	Normal (38-39°C)	31	32	18	
		High (39-40°C)	-	2	4	
		Low (37-38°C)	-	-	2	
7.	Haematology	Haemoglobin (g %)*	12.2	10.9	10.2	
		PCV (%) **	36	33	30	
8.	Straining after retention		Nil	1	5	6.74
9.	Recurrence		1	3	7	12.35
10.	Obstetrical complications	Abortion	-	-	1	1.12
		Premature birth	-	-	2	2.24
		Total uterine prolapse	-	1	3	4.49
		Retained fetal membrane	-	-	1	1.12
		Injury to the genitalia	-	2	5	7.86
		Rectal prolapse	-	1	3	

*Normal Hb value 8 to 15 g %; **Normal PCV value 24 to 46%.

CVP) buffaloes were described to be fresh without external lacerations of prolapsed mass. Group 2 (Second degree CVP) described to be having redness, edema and dryness of the prolapsed mass and intermittent straining. Group 3 (Third degree CVP) buffaloes had severe straining, lacerations, haemorrhage, and necrosis of the prolapsed mass.

8 'R' Principle

The buffaloes affected with CVP were treated initially with 8 'R' principle, for the reduction of CVP. 8 'R' principle includes; R: Restraining the animal; R: Reduce the straining; R: Relieve the urine; R: Remove dung, dirt and dust; R: Reduce the edema; R: Repair the rupture/tear; R: Reduce the mass; R: Recurrence prevention. They were restrained in trevis (standing animals) or in a hind quarter elevator (recumbent buffaloes) and then straining was reduced with epidural anaesthesia using 3 to 5 ml of 2% Lignocaine hydrochloride. The urine was relieved using urinary catheter or by lifting the prolapsed mass. The prolapsed mass was washed with 1 to 2% potassium permanganate solution. Then the mass was reduced with saturated salt solution in animals with edematous prolapsed mass. In case of tear or haemorrhage the injury was repaired by suturing with chromic catgut No. 2 using interlocking suture pattern. The mass was then reduced and repositioned back to its position and the recurrence was prevented using modified conventional vulval truss method or vulval retention suture method and combination of both the techniques to analyse the effective and less complicated method in buffaloes affected with CVP.

Modified conventional vulval truss method

About 12 meters length of cotton rope was used. One end of the rope was loosely encircled

around the neck with eight knot (Figure 5) and the rope was encircled around the body of the buffalo with the 4 inches gap between the encircled rope and taken through the thigh and alongside the vulva and tied (Figure 6). Then another rope was attached with the abdominal rope and taken through the thigh on lateral side of the udder and the vulva and then tied (Figure 7). The both the ropes on either side of the vulva were united by 3 or 4 rows of gauze cloth (Figure 8). Following this technique, all the animals did not have any straining and the owners were advised to tighten the rope at an interval 3 to 4 days. The video of the technique can be obtained from the corresponding author through e mail.

Vulval retention suture

Insert Gerlach's needle lateral to vulva at the level parallel to upper to lower vulval commissure in the hair line through which the umbilical tape is taken out. The same procedure was repeated on the other side. Umbilical tapes on either side of the vulva tied as like cross mattress suture or horizontal mattress suture pattern (Figure 9).

Therapeutic management

All the buffaloes were treated with inj. Enrofloxacin (5 mg/kg BW) i/m, inj. Chlorpheniramine maleate (0.5 mg/kg BW) i/m and inj. Phenylbutazone (0.5 mg/kg BW) i/m for three days. The animals nearing parturition were induced for parturition using inj. Cloprostenol 500 µg i/m and inj. dexamethasone 40 mg i/m.

RESULTS AND DISCUSSIONS

The prolapse of the genitalia occurs commonly during last trimester of pregnancy

particularly in pluriparous animal as compared to heifer (Hasan *et al.*, 2017) and in peripartum (Palanisamy *et al.*, 2018). Our study (Table 1) finds that buffaloes in 6 to 8 months; 8 to 9 months and last term showed 12.35%; 32.58% and 55.05% occurrence of CVP respectively. Dharani *et al.* (2010) reported that prolapse of cervix and vagina are more common in pluriparous animals due to the weak uterine ligaments and loose vaginal tissue. The present study reports that the occurrence of CVP in primiparous animals as 24.71% and in pluriparous animals as 75.28%. In our study, the CVP was classified into three degrees based on the condition of prolapse. In first degree, the animals had mild straining with eversion of cervix and vagina during lying and return on standing (Figure 1). In the second degree, the buffaloes showed continuous straining with eversion of cervix and vagina through the vulva without lacerations and did not return even on standing (Figure 2). In third degree, the animals may have vigorous incessant straining; difficulty in urination; lacerations (Figure 3), haemorrhage and necrosis of the cervix and vagina (Figure 4) and due to continuous straining, few animal may have rectal prolapse. Based on the symptoms and severity, the genital prolapse was into classified four grades by Markandeya (2014) as follows. In Grade 1 prolapse protrusion of vaginal mucus membrane occurred when animal was in recumbency and retracted back on getting up. In prolapse of Grade 2, there was continuous exposure of vagina and cervix in standing and recumbent postures which might have caused lacerations or injuries because of dog bite, crow bite etc. In Grade 3 prolapse, there was complete eversion of vaginal mucosa and

cervix with continuous straining. There might be regular forceful contractions, injuries, and lacerations to prolapsed mass. In Grade 4 prolapse, there was prolapse of genital organs with rectum and there were severe straining and discomfort. Recurrence prevention could be managed by rope truss techniques following standard reduction procedures reported by Kumar (2015). Rope truss technique of recurrence prevention of genital prolapse found to be a popular method in rural areas of India (Sharma *et al.*, 2017). Rope truss was found to be effective, safe, non-invasive, and easy method for retention of prolapse in ante-partum cervico vaginal prolapse cases (Lakde *et al.*, 2014). Management of mishandled cases of post-partum vaginocervical prolapse by recurrence prevention with foreign body in two cows was reported (Varudharajan *et al.*, 2019). Chronic vaginal prolapse was mainly associated with straining resulting from continuous irritable conditions such as cervicitis, vaginitis, traumatic wounds on vagina and vulva and vaginal rupture (Nayak and Samantara, 2010; Selvaraju *et al.*, 2010; Selvaraju *et al.*, 2019). In these above-mentioned methods, suture needle with Johnson button or Minchev technique using umbilical tape suture were placed from the dorsolateral aspect of vaginal wall through the sacrotuberous ligament, gluteal musculature, and finally skin (Alok *et al.*, 2018). But our study reveals that in 29 animals were treated with modified conventional vulval truss method, 10 with first degree; 12 with second degree and 7 with third degree CVP exhibited good prevention of recurrence without much straining and postpartum obstetrical complications. Among 26 animals treated with



Figure 1. A buffalo with first degree CVP.



Figure 2. A buffalo showing second degree CVP with edematous prolapsed cervix and vagina.



Figure 3. A buffalo affected with third degree CVP with a tear in the cervix.

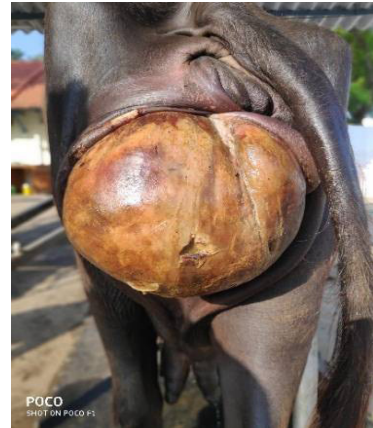


Figure 4. A buffalo affected with third degree CVP—necrotic changes.



Figure 5. One end of the rope was loosely encircled around the neck with eight knot.

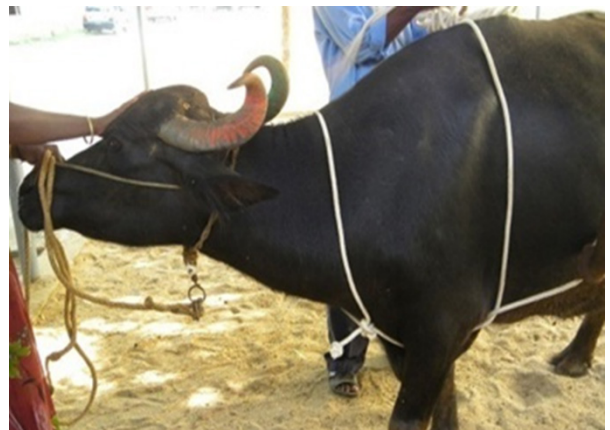


Figure 6. The rope was encircled around the body of the animal and taken through the thigh and alongside the vulva and tied.



Figure 7. Another rope was attached with the abdominal rope and taken through the thigh on lateral side of the udder and the vulva and then tied.



Figure 8. The both the ropes on either sides of the vulva were united by 3 or 4 rows of gauze cloth.



Figure 9. Suture the umbilical tape as like cross mattress suture or horizontal mattress suture pattern.

vulval retention suture method; 1 animal had postpartum total uterine prolapse and 2 animals had maggot wound in the external genitalia. The animals in the first degree CVP showed no recurrence but 1 animal in the second degree and 2 animals from third degree CVP had recurrence with straining. Among 31 animals treated with both modified conventional vulval truss method and vulval retention suture method; 7 animals showed recurrence in third degree; 3 animals had injury in the external genitalia and 12 animals showed various

postpartum obstetrical complications. Thus, in the current retrospective study, modified conventional vulval truss method has been applied to manage the recurrence prevention in CVP and simultaneously the efficiency of the modified conventional vulval truss method; vulval retention suture method and both combined was analyzed in 89 buffaloes with various degrees of CVP. Those animals managed with modified conventional vulval truss method alone exhibited good results with no recurrence, relatively low injury, and

postpartum obstetrical complications. Also, the farmers can easily apply this technique in the field level at emergency situations. Hence it is concluded that modified vulval truss technique explained this paper may be used to prevent recurrence of CVP after its reduction in water buffaloes. Further, awareness of applying this technique should be created among buffalo rearing farmers in rural India so that productive and reproductive life of the buffaloes can be saved in places which are not having easy accessibility to and round the clock veterinary health care.

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