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FIELD-BASED SURGICAL CORRECTION OF CONGENITAL LABIAL FUSION IN JERSEY CROSSBRED CATTLE: A CASE SERIES

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ABSTRACT: *Congenital labial fusion (CLF) is a reproductive abnormality in cattle, charcaterized by occlusion of the labia majora by fibrous connective tissue. This paper reports three cases of CLF in Jersey crossbred heifers intervened at different Gewogs in Mongar Dzongkhag, between January 2024 and March 2026. All reported animals had a history of vulvar fusion from birth and experienced difficulty urinating. During clinical examination, a small residual vulvar opening of 5-10 mm in diameter was observed, urine was passing through these openings as dribbles, and the artificial insemination (AI) gun could not be passed through in any case. Surgery was performed in the standing position under xylazine and caudal epidural anesthesia with 2% lignocaine; in a locally made travis. A longitudinal incision was made through the fused labia using a hemostat as a probe to guide the incision. The mucosal edges were exposed and apposed with a non-absorbable nylon (polyamide) monofilament suture, USP size 1, in a simple interrupted pattern. Postoperatively, all animals were administered a single dose of long-acting oxytetracycline (10 mg/kg body weight, intramuscular) and meloxicam (0.5 mg/kg body weight, intramuscular) for three days, and daily wound dressing for three days with povidone iodine, followed by gamma benzene hexachloride. Uneventful wound healing was observed in all three cases, and the sutures were removed on the 10th day. One animal showed standing heat after the 30th day of surgery and was subsequently inseminated. None of the patients experienced postoperative complications. To the best of our knowledge, this is the first case report of CLF in Jersey crossbred cattle in Bhutan. This paper illustrates that CLF in cattle can be surgically corrected successfully by a simple surgical procedure in field settings with the help of basic equipment and locally accessible materials.*

Keywords: Bhutan; Cattle; Congenital labial fusion; Field conditions; Jersey crossbreed; Vulvar surgery.

1. INTRODUCTION

Birth abnormalities can occasionally occur in cattle populations and can lead to increased perinatal mortality, decreased maternal productivity, and reduced economic significance of affected animals (Mee et al. 2024). Congenital labial fusion (CLF), described as the occlusion of the labia majora by fibrous connective tissue, is the rarest reproductive abnormality encountered and has received limited attention in the veterinary literature (Wedi et al. 2011). The primary cause of CLF is generally ascribed to genetic factors, environmental exposures, or an interaction of both (Roberts 1986; Rousseaux 1994) and may involve other factors like maternal ingestion of synthetic steroids during the early stage of pregnancy, exposure to exogenous medications or enzymatic abnormalities (Craighill 1993; Seller and Bobrow 1987).

In cattle, CLF was first described in a pregnant heifer by Oettle and Coubrough (1985), and was later documented in India by Balasubramanian et al. (1991). Since then, reports of surgical correction with postoperative fertility have been made in Brown Swiss heifers (Yilmaz et al. 2014)

and Holstein Friesian crossbred heifers (Tiwary et al. 2016). Two recent publications have explicitly described CLF in Jersey crossbred cattle; Raja et al. (2019) reported successful vulvoplasty in India, and Raja et al. (2021) used an episiotomy to correct vulvar stenosis, a similar abnormality that causes dystocia. CLF, an autosomal recessive trait, has been documented in common marmosets (Callithrix jacchus) by Isachenko et al. (2002), and one case of natural resolution was also observed in that species (Wedi et al. 2011). Despite the aforementioned published reports, no case of CLF in Jersey crossbred cattle treated and managed under field settings in resource-limited conditions in Bhutan has been reported. This report documents three such cases from Mongar Dzongkhag, intending to present practical guidance to field animal health workers in resource-limited settings.

2. MATERIALS AND METHODS

2.1 Study area

All CLF cases were reported and referred to the District Veterinary Hospital from three different geogs, namely Thangrong, Depong, and Balam, under Mongar Dzongkhag. Mongar Dzongkhag is located in eastern Bhutan at an altitude ranging from approximately 500 to 4000 metres above sea level. It is the largest district in terms of the number of administrative blocks, with 17 gewogs. According to the National Statistics Bureau (2025), Mongar Dzongkhag has the highest Jersey cattle population (13%) in the country, with 10,373 Jersey cattle, representing 52.82% of the cattle composition of the Dzongkhag. Jersey crossbred cattle are predominant in Balam and Thangrong gewogs with 68.88% and 50.97% respectively, and are reared primarily for subsistence milk production and farmyard manure in agriculture. However, local cattle still dominate, with 63.59% in composition in Depong geog. Year-round livestock extension services are delivered by gewog livestock supervisors, and the District Veterinary Hospital (DVH) caters to the referral cases, although diagnostic kits such as ultrasonography are still not available in the veterinary centers in the Dzongkhag.

2.2 Case presentation and clinical examination

Three cases of CLF were reported at different field locations in Mongar Dzongkhag between January 2024 and March 2026. The animals had an apparent history of vulvar fusion at birth and difficulty in micturition. The extent and anatomical direction of labial fusion were clinically assessed through visual inspection of the external genitalia, observation of urination patterns, and manual hemostat probing (Figure 1). A per rectal examination was performed in case 2, which had attained maturity and body size, to rule out other reproductive abnormalities. However, this was not attempted in cases 1 and 3 because the animals were young and had a small body size. Oestrous behavior in case 2 was observed during the clinical examination of the animal. The complete signalment and clinical findings are presented in Table 1.

All examinations and procedures were conducted as part of routine veterinary service delivery. No ethical considerations were sought from the respective owners, as the cases fell under routine field veterinary services.

Table 1: Signalment and clinical findings of three Jersey crossbred heifers with congenital labial fusion.

Parameter	Case 1	Case 2	Case 3
Location	Thangrong, Mongar	Depong, Mongar	Balam, Mongar
Date of presentation	29-Jan-2024	29-Oct-2024	3-Mar-2026
Breed	Jersey crossbreed	Jersey crossbreed	Jersey crossbreed
Age	7 months	24 months	3 months
Body weight (kg)	150	250	120
Parity	Heifer	Heifer	Heifer
Owner complaint	Fused vulva from birth, difficulty in urination	Fused vulva from birth, difficulty in urination	Fused vulva from birth, difficulty in urination
Estrous behavior	Absent	Standing heat observed	Absent
Patent opening location	Dorsal commissure	Ventral commissure	Dorsal commissure
Opening diameter (mm)	5	10	5
Blind pouch	Present (Ventral)	Absent	Present (Ventral)
Urination pattern	Dribbling through opening	Normal but reduced	Dribbling through opening
AI gun passage	Not possible	Not possible	Not possible
Per rectal examination	Not performed	Uterus and ovaries normal	Not performed
Ultrasonography	Not available	Not available	Not available
Haemostat probe finding	Blind pouch at ventral surface	No blind pouch	Blind pouch at ventral surface

2.3 Surgical procedure

The surgical correction of all cases was successfully performed by a veterinary officer under resource-limited field conditions. The animals were restrained in a standing position with the use of locally made wooden travis and sedated using xylazine hydrochloride (0.1 mg/kg body weight, intramuscularly). Caudal epidural anesthesia was administered using 5 mL of 2% lignocaine hydrochloride through the sacrococcygeal junction. The perivulvar region was cleaned with chlorhexidine solution followed by application of povidone iodine to ensure aseptic surgeries.

A sterile hemostat was inserted through the patent vulvar opening and advanced longitudinally to examine and stretch the fused tissue, guiding the precise incision to protect the underlying mucosa from inadvertent injury (Figure 2). The dorsal commissure in cases 1 and 3 was used as a guiding landmark, and incisions were directed downward towards the ventral blind pouch. However, in case 2, incisions were made from the ventral commissure upwards towards the dorsal sites (Figure 3). The

incised mucosal edge of each vulvar lip was apposed to the adjacent vulvar skin using non-absorbable nylon (polyamide) monofilament suture, USP size 1 (IRELYON PAC, M 905 LS) in a simple interrupted pattern (Figure 4). Each procedure was completed within approximately 15 minutes.

2.4 Postoperative management

The postoperative management protocol was similar in all three cases, where they received a single intramuscular injection of long-acting oxytetracycline (10 mg/kg body weight) for antibiotic prophylaxis. To relieve pain and provide an anti-inflammatory effect, meloxicam (0.5 mg/kg body weight, intramuscular, once a day) was administered consecutively for three days. The surgical wound was dressed with povidone-iodine, followed by topical application of gamma benzene hexachloride (GBH) to prevent myiasis, a common problem under field conditions. This treatment was continued for three days. The field livestock supervisors had constantly monitored the animals for the signs of secondary wound infection, abnormal discharge, pneumovagina, urovagina and estrous behaviour in Case 2. After successful surgical corrections and prompt recoveries, the sutures were removed on day 10 postoperatively.

3. RESULTS AND DISCUSSION

Typical clinical signs of CLF were exhibited by all three animals: a small vulvar opening, dribbling of urine, lack of vulvar cleft and an inability to pass through an AI gun (Balasubramanian et al. 1991; Tiwary et al. 2016). Cases traversed animals of 3, 7, and 24 months of age, affirming that CLF does not resolve on its own in cattle, unlike the one documented single case of spontaneous opening in a marmoset by Wedi et al. (2011).

Similarly, with the pattern observed in most bovine CLF cases, cases 1 and 3 each presented a 5 mm dorsal commissure opening with a full blind pouch at the ventral surface (Oettle and Coubrough 1985; Tiwary et al. 2016; Raja et al 2019). Case 2 was anatomically different from other cases, with a 10 mm ventral commissure opening which required an upward incision, no dorsal opening and absence of a blind pouch. This anatomical variation is clinically significant and highlights the importance of careful haemostat probing before incision. Yilmaz et al. (2014) have reported openings at both commissures in a Brown-Swiss heifer, documenting that the anatomy of CLF can vary between individual animals.

Estrous behaviour was not displayed by cases 1 and 3, which can be attributed to the young age of those animals rather than any inherent reproductive disorder. In line with Tiwary et al. (2016) and Raja et al. (2019), Case 2, a 24-month-old heifer presented in standing heat, showed that there will be normal ovarian cyclicity in a complete labial fusion. Per-rectal examination revealed normal uterine and ovarian structures in case 2. Freemartinism and intersexuality were deliberated for differential diagnosis, but were deemed unlikely given normal reproductive findings.

Uneventful wound healing was observed in all three cases, and complete healing was evident at suture removal on day 10. No postoperative complications, including pneumovagina, urovagina, wound dehiscence, or abnormal discharge, were observed in any case (Figure 5). This is in agreement with the results reported in earlier published bovine CLF cases

(Tiwary et al. 2016; Yilmaz et al. 2014; Raja et al. 2019). Non-absorbable nylon (polyamide) monofilament suture (USP size 1) was used in places of absorbable sutures as reported in other studies. The uneventful healing in all cases revealed that nylon monofilament is practical and effective for this procedure.

In the cases reported in this paper, a single dose of long-acting oxytetracycline was used post-operatively, in contrast to multi-day antibiotic courses like ceftiofur for three days in other case studies reported.(Tiwary et al. 2016; Yilmaz et al. 2014). This was deliberately decided because surgery was clean, performed in a short time, and with no major tissue trauma, and daily injectable follow-up is operationally impractical in far-flung remote gewogs. Pharmacologically, it is rational that a single dose of formulation maintains therapeutic tissue concentration for up to 48-72 hours. The uncomplicated recovery in all three cases further supports the effectiveness of this simplified protocol. GBH applied topically following a povidone iodine dressing completely averted wound myiasis, which is common and risky in warm and humid field conditions- no such complications were encountered in any case.

Case 2 exhibited standing heat right after one month of surgery and was inseminated by AI. This observation suggests that normal conception and parturition can be achieved following surgical correction of CLF, and this is in agreement with prior reports (Raja et al. 2019; Tiwary et al. 2016; Yilmaz et al. 2014). The Cases 1 and 3 could not be assessed for reproductive outcome in this reporting period, given their young age.

All three cases were successfully managed under field conditions using a locally made travis, a hemostat, nylon sutures and available medicines, and these findings demonstrate that CLF correction can be effectively performed by trained veterinarians and livestock supervisors without hospital-level infrastructure. The occurrence of CLF in three animals from different gewogs within a relatively short period raises the possibility of a shared genetic predisposition in line with the autosomal recessive inheritance pattern reported by Isachenko et al. (2002) in marmosets. Tracing the parents of these afflicted animals would be valuable for future investigation and study.

Figure 1: Congenitally fused vulva in all three cases, showing the small commissure opening and complete labial fusion

Figure 2: Hemostat inserted through the dorsal commissure opening and directed downward to probe the labial fusion before incision (Case 3).

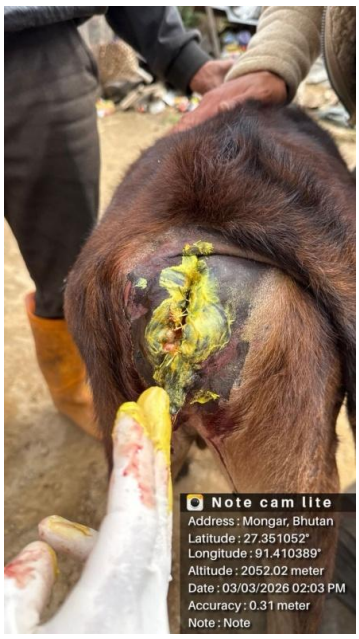

Figure 4: Postoperative appearance following simple interrupted nylon suturing of the mucosal edges (Case 3).

Figure 3: Case 2 (24-month-old heifer) showing the patent ventral commissure opening; incision was directed upward in this case

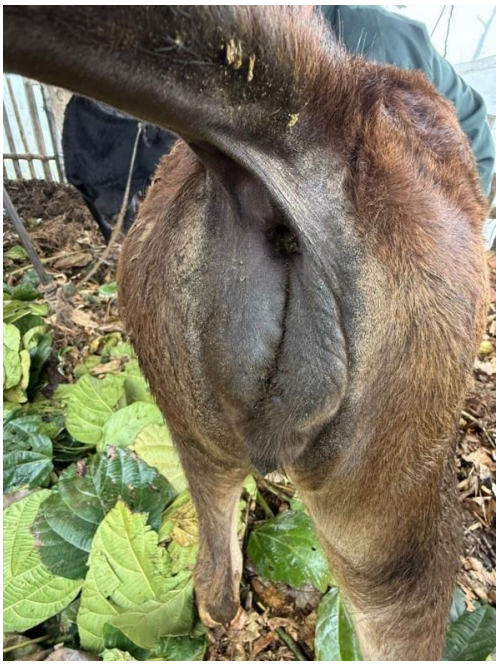

Figure 5: Uneventful wound healing at day 10 post-operatively, at the time of suture removal (representative case).

In the epidemiological context, Mee et al. (2024) reported that congenital abnormalities in cattle occur sporadically and are under-reported. This paper adds Jersey crossbred cattle to the reported spectrum of CLF in cattle and underscores the viability of corrective surgery in resource-limited rural environments.

4. CONCLUSIONS

Congenital labial fusion in Jersey crossbred cattle can be corrected effectively under field settings using basic equipment and locally sourced materials. A simple surgical procedure followed by a single dose of long-acting oxytetracycline, short-course meloxicam, wound dressing with GBH following povidone iodine dressing resulted in uneventful healing and favorable clinical outcomes. Affected animals should not be prematurely culled without trying surgical correction, as normal reproductive functions may be restored after surgical correction.

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