Original Research

Surgical Management of Webbed Teat in Cows

Premsairam, C.*, Aruljothi, N. and Balagopalan T. P.

Department of Veterinary Surgery and Radiology, Teaching Veterinary Clinical Campus, Mettupalayam, Rajiv Gandhi Institute of Veterinary Education and Research, Pondicherry INDIA

***Corresponding author:** sairamprem86@gmail.com

Rec. Date:	May 06, 2018 10:30
Accept Date:	Jul 10, 2018 17:44
DOI	10.5455/ijlr.20180506103054

Abstract

A total of four cross bred jersey cows were presented with a history of dribbling of milk from the affected teats. All the animals were primiparous and in their first stage of lactation. Ultrasonographical examination revealed two separate teat cisterns with the absence of streak canal from the additional openings and were tentatively diagnosed to have Siamese or webbed teats. Surgical correction was advised in all the animals and the condition was confirmed by thelotomy and the defect was surgically corrected. Skin sutures were removed on the 10th postoperative day and all the animals showed uneventful recovery.

Key words: Cow, Primiparous, Siamese/ Webbed Teat, Thelotomy, Ultrasonography

How to cite: Premsairam, C., Aruljothi, N., & Balagopalan, T. (2018). Surgical Management of Siamese Teat/ Webbed Teat in Cows - A Clinical Study. International Journal of Livestock Research, 8(11), 333-340. doi: 10.5455/ijlr.20180506103054

Introduction

Teat affections always lead to economic loss due to loss of milk yield, antibiotics-treated milk and loss of quarter (Awad *et al.*, 2008). Congenital anomalies of teat generally caused by structural alterations that affects the productivity since they are hard to milk (Abd-El-Haddy, 2015). The congenital teat anomalies of teat which were recorded comprising of polyethelia/ hyperthelia/ supernumerary teats, leaker/ incontinentia lactis, athelia (absence of teat), teat aplasia, hyperplasia of teat, teat obstruction, congenital teat fistula, joined teats (conjoined or webbed teat), uneven teats, branched teat canals, single functional teat of the udder (Ghanem *et al.*, 2011, Ragab *et al.*, 2017). Ducharme *et al*. (1987) reported that the webbed/ siamese teat is not a common congenital affections in cattle.

A conjoined teat or webbed teat is defined as the supernumerary teat attached to the side of a primary teat. Insufficient development and function of the streak canal and teat sphincter cause the increased incidence of mastitis (Fubini and Ducharme *et al.*, 2017). The supernumerary teat represents the highest congenital

teat abnormalities as reported by Singh *et al*., 1993. It frequently interferes with milking process and objectionable on show animals without significant effect on milk yield and lactation length which is likely heritable in dairy cattle (Bhowmik *et al.*, 2015). Supernumerary teats that are joined to one of the four major teats are called webbed or Siamese teats (George *et al*., 2008). In webbed teat, the teat and gland cisterns of the adjacent glands have common wall and their lumens do not communicate and is not a common congenital affections in cattle (Ducharme *et al.*, 1987). Webbed teat was presented as a functional extra teat which attached to teat sinus and ranged from distinct extra teat to an elevation area on teat wall with an opening discharging milk which usually confused with teat fistula (Jothi *et al.*, 2016). Surgical correction of webbed/Siamese teat is essential to prevent milk loss and mastitis (Fubini and Ducharme, 2017). To favor early wound healing Yang *et al.* (2016) reported where topical application of recombinant human epidermal growth factor (rhEGF) produces skin keratinocytes and fibroblasts hyperplasia and hypertrophy, as well as corneous layer thickening, and also stimulates peripheral nerve regeneration. This paper discuss about the successful surgical management of webbed teat/ Siamese and its early wound healing with rhEGF on teats in four cows.

Materials and Methods

Four Jersey cross bred cows presented to college hospital were selected for the present study (Table 1).

Table 1: Particulars of Ultrasonographical findings of the webbed teat cows

Case No	Body weight	Affected teat	Location of the Siamese teat	Morphometry (mm)				
				Main teat				Siamese teat Width of the teat sinus
				Width of the teat sinus		Teat wall thickness		
				On the day of presentation	10th post-operative day	On the day of presentation	10th post-operative day	
1	258	Right Fore Teat	Mid teat	7.3	7.2	6.6	13.3	10.2
2	280	Right Fore Teat	Mid teat towards the base	5.6	6.0	10.4	13.8	6.7
3	310	Left Hind Teat	Base	6.7	-	10.2	-	9
4	261	Right Hind Teat	Mid teat level	3.9	6.6	8.5	10.8	3.6

All the animals were primiparous with apparently healthy live calves and in their first stage of lactation. They had history of dribbling of milk from the affected teat other than its natural orifice. Clinical examination revealed mild elevated area on the affected teat with normal patency. The affected teats were subjected to ultrasonographical examination in water bath method using B – mode ultrasound scanner of 7.5 MHz linear probe using normal saline as the contrast material and it revealed normal teat cistern with an additional teat cistern without a distinct streak canal. The width of the normal teat cistern and accessory

 DOI 10.5455/ijlr.20180506103054

teat cistern were measured in all the animals (Table 1). Based on the clinical examination and ultrasound assessment the condition was diagnosed as Siamese/ webbed teat and surgical correction was advised for all the animals except for case 3 in which the patency noticed near teat base and close to the udder gland cistern. The physiological and hematological parameters were within the normal range in all the cases. Milk from the affected teat, on the day of presentation was examined for its color, consistency, pH, California mastitis test by California mastitis test reagent and somatic cell count using modified Newman Lampert staining technique (Table 2).

Anesthesia

Pre-operatively after withholding feed and water for 24 hours (Coutre and Mulon, 2005) all the animals were sedated by using Inj. Xylazine (Xylaxin- Indian Immunologicals, Hyderabad) @ 0.1 mg/kg body weight intravenously and casted on its lateral recumbency facing the affected teat up and prepared aseptically. Ring block was done using Inj. 2% Lignocaine hydrochloride (Modern laboratories, Mumbai).

Surgical Procedure

Two sterile metallic teat siphons were introduced in the natural orifice and the additional opening. An incision was made on the additional teat opening using BP blade no 11 and extended anteriorly along with the probe to expose the teat cistern (Fig.1) The teat siphons which were used to probe the both openings were not communicating and this made to confirm the condition as Siamese/ webbed teat. The exposed additional teat cistern was excised and removed. The mucosal and muscular layers were sutured with polyglactin 910 of size 3/0 (Vicryl Plus – Johnson and Johnson, Mumbai) in simple continuous pattern (Fig.2). Skin apposition was done with braided silk of size 2/0 in cross mattress. Recombinant human epidermal growth factor (Regen-D®, Bharath Biotech, India) was applied on the surgical site and the teat was protected with elastic adhesive bandage (Dynafix®). A sterile modified polyvinyl tube (Infant feeding tube No. 10, Romsons Scientific and Surgicals India) was placed in the teat to maintain the patency and fixed with stay sutures. A sterile disposable 2ml syringe was connected to the modified polyvinyl tube and closed. Postoperatively Inj. Meloxicam @ 0.5mg/kg and Inj. Streptomycin – Procaine penicillin (Dicrysticin- S- Zydus AHL) @ 10mg / kg body weight were administered intramuscularly for 5 days along with intra-mammary infusion of Metronidazole. Wound dressing was done once in three days and the skin sutures were removed on 10th post-operative day and milk was examined for color, consistency, pH, California mastitis test and somatic cell count (Table 2). Ultrasound scanning was done to evaluate the teat patency and wound healing.

DOI 10.5455/ijlr.20180506103054

Fig. 1: Exposing the additional teat cistern which is not in contact with main teat cistern

Fig. 2: Suturing the muscular layer and connective tissue with polyglactin 910 of size 3/0 in simple continuous pattern

Results and Discussion

All the animals in the present study were in an age group of 3 years and the body weight ranged from 258 kg to 310. In case 1, the Right Fore Teat was affected and the location of the Siamese teat was at the level of its mid teat from where dribbling of milk was noticed. Ultrasonographical examination on the day of presentation revealed presence of normal teat cistern with additional teat cistern with a width of 10.2mm without distinct streak canal (Fig.3).

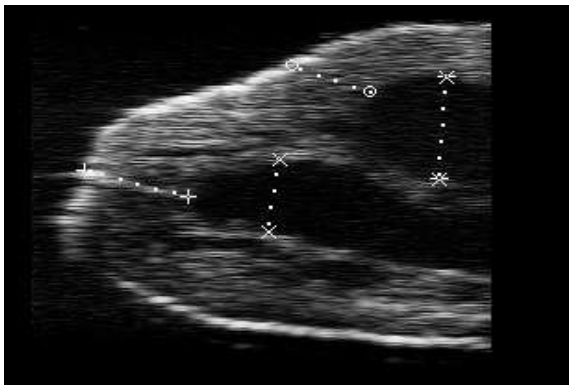

Fig. 3: Case 1. Ultrasonographical examination on the day of presentation of the affected teat showing additional teat cistern without distinct streak canal

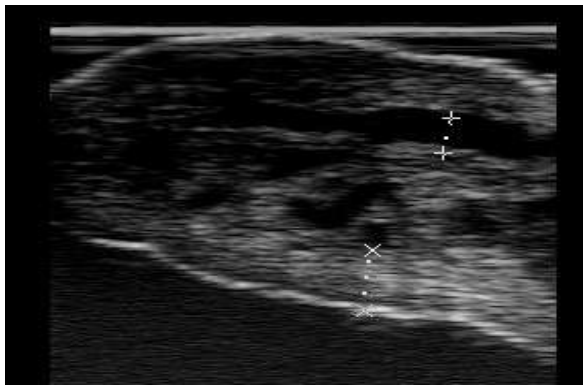

Fig. 4: Case 1. Ultrasonographical examination on the 10th postoperative day showing thickened teat wall with hyperechogenisity indicate wound healing

The Width of the main teat sinus 7.3mm and teat wall thickness 6.6mm were measured. On 10th postoperative day the skin sutures were removed and subjected for Ultrasonographical assessment and it revealed teat sinus width of 7.2mm and teat wall thickness of 13.3mm. It was also observed that teat wall

DOI 10.5455/ijlr.20180506103054

was thickened with hyperechoiec texture and anechoiec teat sinus (Fig.4) which was correlated with wound healing.

Table 2: Qualitative examination of milk

Case No	Colour		Consistency		pH		California Mastitis test		Somatic Cell Count (1,00,000 cells/ml)	
	3rd day	10th day	3rd day	10th day	3rd day	10th day	3rd day	10th day	3rd day	10th day
1	Normal	Normal	Normal	Normal	7	7	Negative	Negative	2,29,287	2,29,687
2	Normal	Normal	Normal	Normal	6	6.5	Negative	Negative	2,22,594	2,25,731
3	Normal	-	Normal	-	6.5	-	Negative	-	2,25,415	-
4	Normal	Normal	Normal	Normal	6	6.5	Negative	Negative	2,23,157	2,26,591

In case 2, the Right Fore Teat was affected at the level of its mid teat towards the base (Fig.5). Teat morphometry on the day of presentation had the Width of the teat sinus of Siamese teat 6.7mm with main teat sinus of 5.6mm and having a teat wall thickness of 10.4mm. On 10th post-operative day revealed hyperechoiec teat wall having thickness of 6mm and anechoiec teat sinus (Fig.6) of 13.8mm width.

Fig. 5: Case 2. Ultrasonographical examination on the day of presentation of the affected teat showing additional teat cistern without distinct streak canal

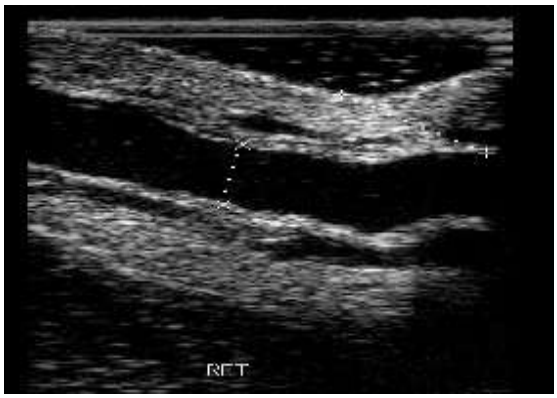

Fig. 6: Case 2. Ultrasonographical examination on the 10th postoperative day showing thickened teat wall with hyperechogenisity indicate wound healing

In case 3, the Left Hind Teat showed dribbling of milk at the level of its base with Teat wall thickness 10.2mm, width of the teat sinus and additional teat cistern of 9mm (Fig.7). By forecasting the poor prognosis surgery was not performed due to the location of the defect.

DOI 10.5455/ijlr.20180506103054

Fig. 7: Case 3. Ultrasonographical examination on the day of presentation of the affected teat showing additional teat cistern without distinct streak canal at the base of the teat

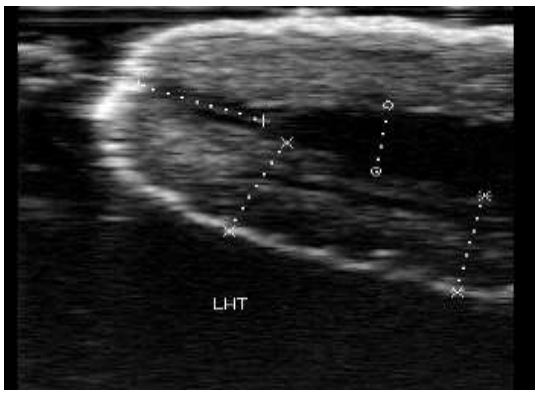

Fig. 8: Case 4. Ultrasonographical examination on the 10th postoperative day showing thickened teat wall with hyperechogenisity indicate wound healing

In case 4, Right Hind Teat showed width of the teat sinus 3.9mm, and teat wall thickness 8.5mm showed a width of the teat sinus measuring 3.6mm. On 10th post-operative day the width of the teat sinus and teat wall thickness were measured as 6.6mm and 10.8mm respectively (Fig.8) and the healing was studied.

Qualitative examination of the milk in all the animals on the day of presentation and three animals except for the case 3 on 10th post-operative day revealed no comparative changes except for slight increase in somatic cell count. Ultrasonographical examination in all the animals except for case 3 on the 10th post-operative day revealed hyper-echogenicity of the skin, teat wall and anechoiec teat cistern which was indicative of healing and closure of the additional opening and it was found to be very useful in diagnosing and also in forecasting the prognosis and findings are in accordance with Jothi *et al*. (2016). In general a webbed teat does not possess a teat sphincter resulting in constant dribbling of milk (Schmit *et al*., 1994) and similar findings were noticed in the present study. All the animals in the present study were primiparous (Balagopalan and Aruljothi, 2016). The quality of milk during the pre and postoperative period was apparently normal.

The anesthetic protocol employed in the present study was found satisfactory with reference to Nichols, (2009); Balagopalan and Aruljothi, (2016). The suturing of mucosal and muscular layers with polyglactin 910 of size 3/0 (Vicryl Plus – Johnson and Johnson, Mumbai) in simple continuous pattern was followed in the present study as explained by Tiwary *et al.* 2006, Nichols and Anderson (2007), Aruljothi *et al*. (2009), Nichols *et al*. (2016). Skin apposition was done with braided silk of size 2/0 in cross mattress (Nichols, 2009). Probing the teat with sterile modified polyvinyl tube was done in the present study and was found to be helpful in maintaining the patency and also for the drug delivery (Aruljothi *et al*., 2012). Topical application of recombinant epidermal growth factor (Regen-D®, Bharath Biotech, India) in the

DOI 10.5455/ijlr.20180506103054

present study was found to be very useful on the wound healing by shortening the healing time (Hong and Park, 2012).

Conclusion

Siamese teat or webbed teat is a congenital anomaly and commonly encountered immediately after the calving in primiparous animals which needs to be differentiated from the teat fistula and a supernumerary teat. Surgical correction was done successfully in all the four animals and ultrasonography is a valuable diagnostic aid in identifying the condition and to study the closure.

Acknowledgement

The authors are thankful to The Dean, Rajiv Gandhi Institute of Veterinary Education and Research, Pondicherry for the facilities provided to conduct the study.

References

1. Abd-El-Hady., 2015. Clinical observations on some surgical udder and teat affections in cattle and buffaloes. *Sch. Journ. Agric. Vet. Sci.*,2(4A): 270-81.
2. Aruljothi,N., Balagopalan,T.P., Rameshkumar,B., and Alphonse, R.M.D., 2012. Teat fistula and its surgical management in bovines. *Intas Polivet*, 13 (1):40-41
3. Awad, M. A., Ahmed, I, H., El-Hamamy, M. M. and Mohammed, M. S. 2008. Survey on surgical affections of udder and teats in small ruminants in Ismailia and north Sinai governorates. *SCVMJ, XIII* (1) 223-239.
4. Balagopalan,T.P and Aruljothi,N., 2016. Surgical management of webbed teat in a cow. *Journal of Agriculture and Veterinary Science*,9 (7): 84-86
5. Bhowmik, L., Khan, P.K.,Bhowmick, S., Bose,R., Roy, S.,Maitra, N.J.,Mukherjee, P., and Nandi, S.K., 2015. Surgical management of teat spider and teat fistula in a dairy cow. *Indian Journal of Animal Health*. 54(2) : 157–158
6. Couture, Y. and Mulon, P.Y., 2005. Procedures and surgeries of the teat. *Vet Clin North Am Food Anim Pract*.21:173-204.
7. Ducharme, N.G., Arighi, M., Horney, F.D., Livesey, M.A., Hurtig, M.H. and Pennock, P., 1987. Invasive teat surgery in dairy cattle I. Surgical procedures and classification of lesions. *Can. Vet. J.*,28: 757-762.
8. Fubini, S.L. and Ducharme, N.G. 2017. Farm animal Surgery. 2nd Edition St. Louis, Missouri: Elsevier, Inc, pp: 487
9. George, L.W., Davis, T.J., Ducharme, N. and Welcome, F.L. 2008. Diseases of the teats and Udder. Text book Rebhun's Diseases of Dairy cattle. 2nd edition by Divers, T.J and Peek, S.F. Saunders publishers Pp.327-399
10. Ghanem, M.E., Nakao, T. and Yoshida, C. 2011. Congenital Absence of a Teat in a Japanese Black Heifer. Case Reports in Veterinary Medicine, Article ID 897065, 3 pages doi:10.1155/2011/897065 Hindawi Publishing Corporation
11. Hong, J. P. and Park, S. W. 2012. The combined effect of recombinant human epidermal growth factor and erythropoietin on full-thickness wound healing in diabetic rat model. *International Wound Journal*, 11: 373–378. doi:10.1111/j.1742-481X.2012.01100.x
12. Jothi,A.N., Balagopalan,T.P.,Thiruselvame,P., 2016. Ultrasonographical evaluation of congenital affections of teat in cows. *European journal of biomedical and pharmaceutical sciences*,3(8): 319-323.
13. Mulon, P.Y., 2016. Surgical management of the teat and the udder. *Vet Clin Food Anim*., 32: 813–832

DOI 10.5455/ijlr.20180506103054

14. Nichols, S. and Anderson, D. E., 2007. Breaking strength and elasticity of synthetic absorbable suture materials incubated in phosphate-buffered saline solution, milk, and milk contaminated with Streptococcus agalactiae. *Am J Vet Res*.,68(4):441–5.
15. Nichols, S., 2009. Diagnosis and management of teat injury. *Food Animal Practice*. 5th Edition.,82: 398-406-
16. Nichols, S., Babkine, M., Fecteau, G., Francoz, D., Mulon, P.Y., Doré, E., and Desrochers, A., 2016. Long-term mechanical milking status of lacerated teat repaired surgically in cattle: 67 cases (2003–2013). *CVJ*.57: 853-859
17. Querengässer, J., Geishauser, T., Querengässer, K., Bruckmaier, R., and Fehlings, K. 2002. Investigations on milk flow and milk yield from teats with milk flow disorders. *J. Dairy Sci*.,85:810-817
18. Ragab, G. H., Seif, M. M., Abdel-Rahman, M. A. and Qutp M. 2017. Prevalence of udder and teat affections in large ruminant in Beni-Suef and El-Fayoum provinces. *Journal of veterinary medical research*, 24 (1): xx-xx
19. Schmit, K.A., Arighi, M. and Dobson, H. 1994. Postoperative evaluation of the surgical treatment of accessory teat and gland cistern complexes in dairy cows. *Can Vet* J 34: 25-30.
20. Singh, J., Singh, P. and Arnold, J.P., 1993. The mammary glands. In: Ruminant Surgery (Tyagi RPS and Singh J, eds). CBS Publishers and Distributors, New Delhi, India, pp 167-174
21. Yang, S., Geng, Z., Ma, K., Sun, X. and Fu, X. 2016. Efficacy of Topical Recombinant Human Epidermal Growth Factor for Treatment of Diabetic Foot Ulcer: A Systematic Review and Meta-Analysis. *The International Journal of Lower Extremity Wounds* 1– 6.

DOI 10.5455/ijlr.20180506103054