Sonographic findings of congenital bovine teat and udder affections

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ABSTRACT

The objective of this study was to elucidate sonographic findings of congenital affections of bovine teat and udder. The present study was carried out on twelve bovine patients presented to Teaching Veterinary Clinical Complex, College of Veterinary and Animal sciences, Palampur. Various congenital affections observed were ectopic udder, congenital teat fistula, conjoined teat and congenital athelia. An ectopic udder was evident with functional gland cistern and teat cistern and was having a mixed echogenic mass of tissue. Congenital teat fistula showed an accessory full-thickness opening in the lateral teat wall. The conjoined teat was revealed as an accessory hypoechoic tubular cavity found adjacent to the normal teat cistern. Congenital athelia was evident with the absence of teat cistern and streak canal. The longitudinal scan at the level of glandular region revealed an anechoic gland cistern. Based on the sonographic evaluation of congenital teat and udder affections, the ultrasonography proved as a vital diagnostic aid for diagnosing various insidious congenital teat and udder disorders. Sonography equips the surgeon/clinician in ascertaining the prognosis and helps in the future aspect of bovine udder and teat disorders management and formulation of a precise and efficient therapeutic plan.

Key words: Athelia, Conjoined teat, Ectopic udder, Gland cistern, Streak canal, Teat cistern, Teat wall.

INTRODUCTION

The udder is a very important organ and of economic significance in dairy cattle. Though highly susceptible to various disease disorders e.g. mastitis, mamallitis, warts, tumors, lacerations, strictures etc. congenital anomalies in the udder are of rare in incidence. The udder and teat affections constantly lead to economic loss in milk yield, loss in antibiotic treated milk, possible loss of quarter if there is a necessary to dry off, and lastly reflected on the economic value of dairy animal. Hence, a renovated knowledge on udder and teat surgical affections and abnormalities is found to be highly needed (Schukken, et al., 1992).

Congenital anomaly in bovine udder comprises many structural defects such as fusion of teats, large base or funnel shaped teats, incorrectly placed teats and supernumerary teats. So the present study was designed to elucidate sonographic findings of congenital affections of bovine teat and udder.

MATERIALS AND METHODS

The present study was carried out in 12 bovine patients presented to Teaching Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Palampur suffering from various teat and udder affections. These animals were subjected to systemic evaluation for the diagnosis of disease condition using ultrasound. Scanning and image documentation of various structures of teat and udder in different planes and definition of their eco-architecture was done using Siemens Acuson X300 ultrasound system premium edition and scanned using a 5.3-10 MHz linear transducer. Scanning was conducted by transcutaneous and water bath techniques. Water bath technique included dipping of the teat in a plastic cup filled with warm water having a temperature of 37°C.

RESULTS AND DISCUSSION

Ectopic functional udder: Ectopic udder was observed in a cow having three teats. The sonography was carried out to ascertain the presence of functional gland cistern and teat cistern. The gland cistern and teat cistern were evident in two teats (Fig 1 and Fig 2), whereas one teat lacked both the cisterns. The ectopic udder was having a mixed echogenic mass of tissue. The gland cisterns were found to be interposed in this mixed echogenic tissue. A similar case of ectopic udder in an Iraqi female goat was reported by Al-Sadi et al., (1994). Surgical excision of the ectopic udder mass was performed and it was observed that excised tissues were lobular and contained milk like fluid (Fig 3 & Fig 4). The mass was dark yellowish in colour with consistency similar to lactiferous tissue. The lactiferous tissue was also having numerous cavities which resembled lactiferous ducts and vessels. Each lobule was surrounded by a thick connective tissue capsule containing interlobular ducts, blood and lymph vessels. Out of three teats originated from this ectopic udder only two were having functional teat orifice. These ultrasonographic findings designated the tissue mass as an ectopic mammary tissue with functional teats.

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Congenital teat fistula: Two cows (age 3-4 years and 1-2 parity) were presented with the history of leakage of milk from the extra openings in the teats. When these openings were cannulated with a siphon, milk could be drained from them (Fig 5). The Teat cistern was showing an accessory full-thickness opening in the lateral teat wall (Fig 6). However, the area of distal one-third of the Teat cistern was occupied with a mixed echogenic cord (Fig 6). Teat fistula appeared as thick hypoechoic tubular structure communicating with the primary teat sinus or streak canal. Hoque et al., (2004) and Fubini and Ducharme (2004) also reported the same findings. Velavan et al., (2014) sonographically diagnosed 0.5 mm diameter teat fistula in a cow and further reported that teat fistula does not possess a separate streak canal or teat sphincter. And it can be congenital but usually results from a full thickness teat laceration and occurs as a complication of secondary wound healing or dehiscence after primary healing. Nouh et al., (2014) described the teat fistula as an abnormal passage connecting between the teat cistern and the teat surface. The opening of the fistula discharging milk, some cases were suffering from suppurative mastitis and the abnormal opening discharging pus.

Conjoined teat: Two primiparous cows (age 3 and 3.5 years) were presented with the history of leakage of milk from extra
openings present on teats. The affected teats were tested positive for California mastitis test. The longitudinal scan of affected teats revealed an accessory hypoechoic tubular cavity found adjacent to normal teat cistern and gland cistern of main teat (Fig 7). The accessory tubular tract was separated from main teat cistern and gland cistern by a thick hypoechoic layer. The upper portion of tubular tract was wide and resembled gland cistern of conjoined teat whereas lower narrow hypoechoic tract resembled teat cistern of conjoined teat (Fig 7). The teat Cistern of conjoined teat terminated with a small opening at the lateral side of teat tip which resembled teat orifice. The teat wall layers of the main teat were thickened and were merging in echotexture. The mucosa of teat cistern was also thickened and delineated from the remaining teat wall layers. The area of streak canal in the main teat was obscured with adjacent sphincter muscles. The gland cistern of the conjoined teat was having independent draining ducts from lactiferous tissue.

Franz et al., (2009) also reported that conjoined teat was a supernumerary teat adjoined to the main teat. In concordance to our findings Franz et al., (2009) reported an increased incidence of mastitis in conjoined teats due to incomplete emptying. Therefore, diagnosis of conjoined teat and differentiation from a teat fistula is of great importance. Fubini and Ducharme (2004) reported conjoined teat (or webbed teat) as a supernumerary teat attached to the side of a primary teat and conjoined teats do have accessory glands of various volumes.

Congenital athelia: A primiparous cow aged 3.5 years was presented with history of absence of milk let down from all the quarters since calving. Prior to calving, the udder was
having four small teat-like protuberances (length-0.5 cm) which were not appreciated after calving. The physical examination revealed absence of all teats and region of teats was showing uniform conical swellings (Fig 8). The longitudinal scan at the level of teat base revealed absence of teat cistern (Fig 9). Whereas at the level of glandular region an anechoic gland cistern was observed. However, the gland cistern was irregularly shaped and smaller in size (Fig 9). The lactiferous tissue was showing uniformly mixed echogenicity.

Complete absence of teats is a rare condition, but isolated cases in which teats were only represented by slight eminence have been reported by Baskal et al., (1979) in a she goat and Conner (1980) in buffalo. Kulkarni and Kulkarni (1998) reported athelia with amastia (presence of two teats) in a five-year-old buffalo. Similarly Sagar (2009) reported a case of complete congenital athelia in buffalo. Dandale et al., (2013) described a case of athelia in a Jersey cross-bred cow. Specific cause of these conditions is unknown till date but Leipold et al., (1983) reported that congenital anomalies are caused by genetic or environmental factors or by the interaction of both.

Based on the sonographic evaluation of congenital teat and udder affections, the ultrasonography proved as a vital diagnostic aid for diagnosing various insidious congenital udder and teat disorders, which can be potential threat to the productivity of animals. Along with the diagnosis additional features like size, shape, location, vascularity, contents were also ascertained. Sonography equips the surgeon/clinician in ascertaining the prognosis and helps in the future aspect of bovine udder and teat disorders, management and formulation of a precise and efficient therapeutic plan.

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