

CONGENITAL TETRA – PEROMELIA ASSOCIATED WITH BRACHYURY IN A COW CALF

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Abstract: As per author's knowledge, tetra – peromelia associated with brachyury is rare in occurrence and not yet reported in India. A one-month-old cow calf was presented with signs of ataxia. It's all four limbs and tail were malformed congenitally and confirmed as tetra – peromelia associated with brachyury based on anatomo- physical examination.

Keywords: Congenital abnormality, Tetra – Peromelia, Brachyury, Cow calf.

Introduction

Peromelia is a developmental abnormality characterised by the lack of limb distal extremities. This is also called as congenital limb amputation as the limb is formed proximally and appears amputated at different points distally (Palmer, 1993). Cases of peromelia were reported in cow calves (Szczerbal *et al.*, 2006), buffalo calves (Albarella *et al.*, 2009), kids (Corbera *et al.*, 2002), lambs (Samuel *et al.*, 2014) and pups (Lallo *et al.*, 2001). Genetic reasons like gene mutations, chromosomal aneuploidy and translocations (Szczerbal *et al.*, 2006) and consanguineous mating (Ozenc, 2014) resulted in these morphological aberrations.

Brachyury is partial absence of tail *i.e.* tail is developed up to base or half or only switch is absent. It is another congenital anomaly observed rarely in calves. In dog breeds such as cocker spaniels, it was found to be a hereditary and generally non-lethal defect, where as in calves it was possibly an inherited lethal or semi lethal character (Roberts, 1971). All the previously mentioned reports were regarding hemimelia in single limb and without any associated abnormalities. In this report, we present you a very rare case of tetra – peromelia associated with brachyury in a cow calf.

Case history and Clinical Observations:

A one-month-old cow calf whose four limbs and tail were malformed, was presented to Veterinary Dispensary, Haripuram, Srikakulam district, Andhra Pradesh, with complaint of ataxia since three days. It was born as 9th calf to a non – descript cow which was conceived by artificial insemination with Ongole breed semen. Congenitally, it's all four limbs and tail were poorly formed. After birth, it could walk on its own with poorly formed legs and suckle the dam only on external support, but presently it's being fed with bottle milk only. Anamnesis further revealed that it's dam recovered from severe attack of organo - phosphorus poisoning one-month post service. The owner also reported that previous progeny of the cow were normal. As per institutional records, the progeny of the particular sire also were normal.

The calf was active, but, showing signs of mild ataxia, inflamed limb extremities and all other physiological parameters were within normal range. All its limbs and tail were malformed. Right fore limb was formed up to distal extremity of radius and ulna only, while in left fore limb, in addition to this, carpals were also formed but, in a fused state represented by a round prominence. The right hind limb was formed up to mid shaft of metatarsus only, while the left one was formed up to distal third of metatarsus only. In addition, its distal extremity appeared round and hard on palpation. Though the parts of concerned limbs were absent after mentioned level, the limb musculature up to that level in all four was formed completely. The distal extremities of all the limbs were swollen, hot and painful to touch. It could stand on its own and walked with stumbling gait. The tail of the calf also malformed that end abruptly after 5 – 6 coccygeal vertebrae that could be confirmed on palpation.

Treatment and Discussion

The calf was administered with 400 ml 5% dextrose normal saline, B - Complex 2 ml I/V, and Vitamin A 1 ml I/M. The limb extremities were applied with Inflammint ointment and protected with soft padding. Advised the owner to follow this treatment regimen and to support the calf to take milk by suckling and start milk replacer feed slowly.

Congenital anomalies may affect single or many parts of body and mostly affected musculoskeletal system (Roberts, 1971). In the present case, only appendicular skeleton that too distal extremities were affected without any abnormalities in other systems. Albarella *et al.* (2009) reported transversal hemimelia cases in single limb of Iranian buffalo calves, in which the limbs were not formed beyond metacarpal or metatarsal. They were supposed to be resultant of inherited single autosomal recessive gene. Ozenc (2014) published a case of

peromelia in all four limbs in a calf in which, the fore limbs were formed up to humerus and hind limbs up to femur only. In another report, Ozmen (2015) presented right brachial peromelia in a cow calf, in which the peromelic limb has scapula only and humerus was hypoplastic and radius and ulna were represented by a small nodule.

Another rare congenital anomaly brachyury i.e. partial absence of tail was also observed in this calf. The tail was formed up to 5 – 6 coccygeal vertebrae only, as identified on palpation. Lotfi and Shaharyar (2009) reported a rare case of anury (complete absence of tail) in a female Iranian calf. Huston and Wearden (1958) reviewed different tail abnormalities like rat-tail and reduced switch syndromes in which the tail was ill-developed (brachyury) or absent (anury). The taillessness in the present case was accompanied with peromelia only, while others reported rectal adhesions, excretion difficulties (Huston and Wearden, 1958) and atresia ani (Anwar and Purohit, 2012). Most of these defects in tail development were of genetic origin and appeared in the process of crossing different breeds (Hills, 1997). In the present case, the cow was a non-descript one and conceived by artificial insemination. The institutional records ruled out birth of any abnormal calves.

The occurrence of present anomalies due to organophosphorus poisoning during early pregnancy cannot be ruled out, as organophosphates were proved to cause such defects in animal models. In vitro teratogenic effects were found to take place at early gestation especially between 6 – 15 days in rats. The organophosphates exert anti acetyl cholinesterase activity during organogenesis and result in malformed foetuses, neural tube defect and shortening of pregnancy (Nurulain and Shafiyulla, 2012). Though we could not trace the actual aetiological factor in the present case, further studies are warranted to track the origin of teratology.

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Fig 1: Peromelia in all four limbs in the calf. Note the agenesia below radius and ulna and below mid metatarsus



Fig 2: Calf standing with difficulty. Note the partially formed tail.

