

## Arthrogryposis in a Calf

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Arthrogryposis, is one of the congenital anomalies reported in cattle, is an extreme form of contracted tendons in which many joints are in flexed state. The present case reports about Arthrogryposis in a calf.

### History and clinical observations

A calf aged about one week, that was delivered through caesarean section was presented with a history of deformed limbs (Figure-1). It was said to have borne to an inbred dam which was inseminated. The calf was recumbent with all of its limbs being unable to bear weight.

Clinical examination revealed that the joints of all the four limbs lacked normal angulation. The deformity was more marked in hind limbs when compared to the forelimbs. Even in the fore limbs, the contracture was not symmetrical. The right fore limb had an excessive angulation at the carpal joint with the convexity directed anteriorly, while its contra lateral hind limb had an exaggerated contracture at the hock joint and the digits of the latter were star grazing. The right hind limb was apparently normal up to hock and there after the limb was upturned.

Except these musculo skeletal abnormalities the calf appeared normally and it could suckle its dam with assistance.

### Treatment and discussion

Arthrogryposis is a congenital defect described as an extreme form of contracted tendons in which many joints are flexed or extended and is considered to be secondary to a primary neuromuscular malformation and was reported to occur in horses, cattle, sheep and pigs (Latshaw, 1987). The condition may involve two, three or all four limbs.

The aetiology for this anomaly appears multifactorial, with varying symptoms. Agerholm (2001) indicated genetic aetiology for arthrogryposis, as the cases occurred following breeding especially between genetically related individuals.

Nawrot et al (1980) documented this defect in calves of Charolais breed and its crosses, due to

autosomal recessive gene with complete penetration in homozygous state.

Jones (1999) described persomus elumbis as vertebral agenesis and arthrogryposis in a still born Holstein calf and he opined that chromosomal aberrations within the homeobox gene family were the contributory factor. Inherited ovine arthrogryposis has an autosomal recessive mode of inheritance (Murphy et al 2007).

Viruses like akabane virus in cows (Kurogi et al, 1977), cache valley virus in lambs (Bermejello, 2003), and aino virus in neonatal calves (Tsuda et al, 2007), were also attributed to be the cause of arthrogryposis. The wide spread use of semen from sires of different pedigrees of affected calves made several countries to transmit this anomaly.

Genetic causes appeared to be responsible for the present case as the dam was a known inbred and no reports of viral aetiology were available.

The present calf was normal sized, and did not show any other associated congenital defects. Contrary to these findings, calves borne with arthrogryposis were small sized with a dome shaped head, scoliosis, maxillary retraction, sunken eyes, cataracts and irregularities of teeth (Kitano et al, 1994), hypotonia and palatoschisis (Russel et al, 1985) and growth retardation (Agerholm, 2004).

As the calf was otherwise normal, an attempt was made to relieve the contracture by performing tenotomy of flexors responsible for causing the excessive contracture of the fetlock joint of right hind limb and hock joint of left hind limb. Half limb casts using plaster of paris were applied to both the hind limbs leaving windows for the suture lines. However, the response seen was not significant and the farmer salvaged the animal at a later date. The farmer of the calf was advised to cull the dam because of possible genetic involvement.

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