



## RESEARCH ARTICLE

### FIRST BRANCHIAL ARCH SYNDROME IN A CALF

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#### ABSTRACT

A calf with two and a half months of age suffering from anomalous face parts exhibited unilateral features of 'first branchial arch syndrome' or 'Treacher Collins syndrome' with symptoms of deviation of the muzzle to left side, tongue to the left and absence of prominence of cheek on left side left ear displacement and abnormal dentition of right side. Congenital anomalies occur as a result of genetic or environment reasons or due to a combination of both. Although not much was known about the etiology, some cases were thought to be inherited due to autosomal recessive gene, with a higher incidence in farms where inbreeding was practiced.

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#### INTRODUCTION

Congenital defects are uncommon but do occur in most breeds of cattle with variation in frequency of occurrence. These can cause abortion or be present at the time of birth. Defects are abnormalities in skeleton, body form and body functions. The etiology of these defects is either genetic -due to recessive gene- or environmental, which includes maternal nutritional deficiencies, endocrine disturbances, extremes of temperature during pregnancy, radiation, drug or chemical exposure, ingestion of toxic agents, mechanical interferences with the foetus and some viral infections during pregnancy (Roberts, 1971). The forming head is a community of interrelated cells, tissues and complex organs. Anomalies of the face constitute a special category of birth defects because they involve several organ systems and functions including the upper respiratory and alimentary tracts, speech and facial expression. The study of face anomalies is always essential to provide a rational basis for diagnosis, treatment, and clinical and laboratory investigations. This study was conducted to elucidate the anatomical peculiarities observed in a female calf with anomalous face parts.

#### MATERIALS AND METHODS

A calf with two and a half months of age was brought to the Veterinary Hospital of College and Veterinary and Animal

Sciences, Pookot in Kerala. The animal weighed 32 kilograms and was able to take in milk or grass, only if the head was kept elevated. It was admitted to the inpatient ward but died after two days suffering from pneumonia, since respiratory infection due to aspiration of food is common in such cases with a grave consequence of poor prognosis. Immediately after death, the animal's body was embalmed using 10% formalin and the head was dissected out to study the anomaly in detail.

#### RESULTS

Rostral part of upper jaw of the calf was short with muzzle, nostrils and upper lip deviated to the left. Right nostril was very much constricted. Tongue was projecting out due to shorter and deviated upper jaw and appeared slightly tilted to right side. Lower jaw was normal and faced rostrally. Upper and lower jaws did not correspond with each other. Prominence of the cheek was absent on left side. Hard palate was split and contracted. The nasal bone and premaxilla were deviated to one side with its rostral end pointing to the left. Due to its peculiar position, the nasal bone came into contact not only with the frontal bone and maxilla, but also with the lacrimal and zygomatic bones on the left side. The frontonasal joint was defective and extensive and projected upwards. The muscles of the lips and nostrils on the left side, viz. levator labii maxillaris, caninus and depressor labii maxillaris, were



**Fig. 1. Dorsal view of the live calf with Unilateral Treacher Collin's Syndrome showing protruding tongue and deviated nasal region**



**Fig. 2. Face of the embalmed calf showing constricted right nostril. Lateral view**

constricted and ill developed. The dental pad was deviated to left side. This resulted in a disparity in the size of the diastema on the two sides, with a relative increase on the right side and a great reduction on the left. This abnormality probably resulted from a unilateral condition of the 'first Branchial syndrome' or 'Treacher Collins syndrome', due to a unilateral defective development of facial bones involving an underdeveloped first branchial arch of one side.

It affected the development of maxilla and premaxilla with a defective frontonasal joint and lateral facial musculature. The condition occurs due to genetic reasons and is inherited as autosomal dominant.

## DISCUSSION

The symptoms found in this study were in accordance with those described by Singh and Pal (2008) for this 'mandibulofacial syndrome'. But coloboma type lower eyelid abnormalities and ventral and caudal displacement of the ear as reported by the authors were absent in the present case. The change may be attributed to the lesser extent of the anomaly. The morphological changes of craniofacial skeletons with various types of clefts of the face depended on the site and degree of the cleft formation and reflected developmental errors of the embryonic segments of face. These changes would suggest disorders of the correlated development of facial processes and of other foetal organs of the face (Moritomo *et al.*, 1999). Although not much was known about the etiology, some cases were thought to be inherited due to autosomal recessive gene, with a higher incidence in farms where inbreeding was practiced (Singh and Little, 1972). Since the above conditions were inherited, the best control is by genetic planning i.e. to avoid animals that carry these genes from breeding programmes and by purchasing bulls or semen from reputable breeders produced by parents who did not carry undesirable genes (Ogilvie, 1998). Congenital anomalies occur as a result of genetic or environment reasons or due to a combination of both. Developmental anomalies encountered in animals leads to a financial crisis in small scale dairy farmers. When the environment is the cause, adjustments in the management can reduce further economic losses. However, genetic (inherited) causes are much more complex and difficult to correct (Vijayanand *et al.* 2009).

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