Cleft lip (hare lip), campylorrhinus lateralis (wry nose) and congenital flexural deformity of the metacarpophalangeal joints in a calf

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A 3 days old native breed male calf was admitted to the veterinary teaching hospital, Assiut university suffered from facial anomalies and flexural deformities in the metacarpophalangeal joints resulting in respiratory snoring and inability of the animal for ambulation. The defects of the limb were only managed surgically by cutting of the superficial and deep flexor tendons then external coapitation of the limbs using splints and gypsum.

Congenital anomalies are defects of structure or function that appear at birth. The congenital diseases may result from genetic factors or environmental factors (Blowey and Weaver, 2011). The genetic factors may have effect at the early stage of gestation (first 2 weeks), while the environmental effect may appear later (14-42 days of gestation) (Johnson et al., 1985 and Aiello 1998).

Congenital oronasal fistulas are the results of the failure of fusion of the palatine shelves during gestation. The clefts either include the primary palate (lip and incisive bone) causing cleft lip (hare lip) or the secondary palate (hard and soft palate) resulting in cleft palate. Cleft palate and cleft lip were detected in most domesticated animal species, including dogs, cats, ruminants, horses, and camels. In cattle, the cleft palate is associated with skeletal deformities such as arthrogryposis (Kahn and Line 2005). Wry nose is considered one of the craniofacial anomalies associated with the congenital oronasal fistula. It
is a congenital condition of the most rostral aspects of the incisive bones (Gracia-Calvo et al., 2014). These anomalies may be ascribed to an autosomal recessive gene with other environmental and nutritional factors during the gestation especially at the early period. Hypervitaminosis A, folic acid deficiency, administration of griseofulvin and ingestion of toxic plants such as lupine and poison hemlock have detrimental effect to cause cleft lip and palate in the feti of cattle and other small ruminants (Kahn and Line 2005 & Reiter, 2010).

A flexural deformity is the deviation of the limb in the sagittal plain either causing persistent hyperextension of the limb or hyperflexion at the level of joint region. The persistent hyperflexion is termed contracted tendons. The tendons are not actually contracted but they are short in relative to the osseous structures in the limb (Schneider, 1989). The new definition of the flexural deformity is the restriction of the joint of the affected limb in a flexed position or inability for complete extension of the joint (Adams, 2006). The type of deformity is named according to the affected joint. The distal interphalangeal joint, the metacarpophalangeal and metatarsophalangeal joints, carpal joints are the commonly affected joints. The deformities are recorded more in the forelimbs than the hindlimbs. The problem may be encountered in more than one limb in the same animal (Greet, 2000).

A 3 days- old native breed male calf was admitted to the veterinary teaching hospital (VTH), Assiut University, suffering from cleft lip (deep groove extends obliquely across the upper lip, nasolabial plate and jaw), the absence of the left nasal opening associated with right deformity of facial bones (the
nasal, incisive and maxillary bones) (Figure 1). The physical examination showed that the calf had snoring sound associated with increase of respiratory rate. The absence of the left nasal opening lead to the dilation of the right one. The suckling reflex was normal. The calf also had bilateral forelimbs flexural deformities (Figure 2) that caused the animal hardly to ampulate on the forelimb and to reach to its dam for feeding.

The thorough examination of the nasal bone revealed that the presence of the nasal cavity divided by the nasal septum, but the right lateral deviation of the nasal bone and the nasal septum caused stenosis of the left half of the nasal cavity which hinder the passage of the inspired and expired air creating of the snoring sound. The right lateral deviation of the tongue with rolling of saliva also were noticed in this case as result of the distorsion of the facial and mandibular bones.

The calf was treated only for flexural deformities surgically by severing of the superficial and deep flexor tendons in both limbs. The flexed joints were checked preoperatively whether the limbs can be extended manually or not.

The degree of flexion of the fetlock joints decreased by 38° (102° to 140°) in the left forelimb and by 40° (120 to 160°) in the right limb. The prognosis is considered guarded according to this finding.

The calf is placed in lateral recumbency with the operated limb uppermost. The distal limbs were prepared for surgical operation. The metacarpal regions were shaved and aseptically prepared and draped for operation.
Linear infiltration anesthesia was performed using 1% lidocaine HCl. A tourniquet was applied just distal to the carpal joint for haemostasis during the operation. A 6 cm linear incision was performed on the lateral aspect of the metacarpal region over the flexor tendons. The incision was passed through the skin, subcutaneous tissue and the fascia. Blunt dissection was done to separate the superficial flexor tendon (SFT) from the deep flexor tendon (DFT) using hemostats (Figure 3). The lateral Palmar nerve and adjacent vessels were kept during dissection. The SFT was severed first and the angle of flexion of the fetlock joint was checked. The DFT was severed when the extension of the limb was not achieved. The SFT and DFT were cut in both limbs. The subcutaneous tissue and skin were apposed by the cross-mattress pattern using 2# silk and sharp needle. The limbs were coapitated externally using a combination of the splints on the Palmar aspect of the limb including the carpal and the fetlock joints and extended to the claws, and plaster of Paris bandage after sufficient padding of the limb using the cotton then rolls of gauze for application of pressure (Figure 4). The external coapitation lasted about 45 days postoperatively. The calf received broad spectrum antibiotic for 5 days (Ampicillin trihydrate 10 mg/Kg. B.W.) postoperatively.

The follow-up of this case was performed using the phone. The owner said that the animal is walking and running on his feet, but the animal is stunted in growth and its general health condition is bad.

Each of the cleft lip, wry nose and flexural deformities of the metacarpophangeal joints were recorded in farm animals (ruminants and
equine) but individually (Greet, 2000, Kahn and Line 2005, Gracia-Calvo et al., 2014), while all of the anomalies were combined in the present case.

It was noticed variable anomalies that affect the facial bones and appendicular skeleton as was reported by Van Huffel and De Moore (1987). Cleft lip and wry nose were reported in shorthorn calf (Blowey and Weaver, 2011), while the present case was a native breed which explain that these anomalies may affect different breeds and the condition is not a breed specific. The dam of this calf was pleuriparous and the owner noticed this condition for the first time, which overweigh that the external factors such as massive manipulation during pregnancy diagnosis in the early stage of gestation or cumulative effect of ingested toxic plants or radiation may have teratogenic effect and may reduce the probability of the genetic factors.

The cleft lip did not cause any clinical signs (Reiter, 2010), but the only sign that appeared on the animal was related to the respiratory system. The deformity of the nasal bone (wry nose) caused a stenosis of left half of the nasal cavity resulting in snoring sound.

The cleft lip and wry nose were not managed in this calf. This is due to the defect (cleft) of the lip is severe which hardly to be reconstructed. Moreover, the reconstruction of cleft lip was expected to may cause more dilatation of the right nasal opening causing rhinitis. Gracia-Calvo et al., (2014) have recommended the surgical interference in case of wry nose should be performed when the deformity of the facial bones is severe, threating seriously the foal´s survival. In our case, it was noticed the normal breathing of the animal except the snoring sound.
It was recorded in this case that the flexural deformities of the metacarpophalangeal joints affect both forelimbs as described by Greet (2000). The management of the flexural deformities depends on the degree of joint flexion. In our case the manual trials for joint extension were carried out to determine the value of the operation to improve the condition. The decreased angle of joint flexion is achieved after the severing of the SFT and DFT (Ducharme, 2004). According to the results of our case and ambulation of the animal in the postoperative period, the using of combination of splints, pressure bandage and gypsum support the body weight of the animals on the operated limbs. Ducharme (2004) preferred the use of splints with pressure bandage to correct the flexural deformities without surgical interference. The need for splints postoperatively depends on the degree of joint flexion and transected tendon. The splints are not needed postoperatively in case of transection of the SFT, while in case of the cutting of DFT the use of splints to support the animal is mandatory for 30 days postoperatively.

It was concluded from this report that the calf may be born with variable anomalies that affect different body regions. These anomalies may be or may be not managed medically or surgically.

References


Figure 1. Cleft lip and wry nose in 3 days old calf

Figure 2. Flexural deformities at the metacarpophalangeal joint in a calf
Figure 3. Dissection of SFD (red arrow) from DFT (black arrow) before their transection

Figure 4. Standing of the calf immediately postoperatively after surgical correction of the flexural deformities and support of the limbs with splins and gypsum.