

Short Communication / Kısa Bilimsel Çalışma

**A case of monobrachial peromelia in a two years old
Holstein cow**

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Summary: Peromelia is a severe congenital malformation of the limbs, including absence of the lower part of the extremity. It is one of the rarely observed malformations in animals. Monobrachial peromelia was observed in a male, 2 years old Holstein cow in the right forelimb. The cow examined gross pathologically before and after slaughter. It was clinically healthy and in good body condition. The proximal limb from the shoulder up to the radius and ulna was developed. Normal scapulae, hypoplastic humerus and rudiments of the proximal segments of the radius and ulna were present. Normal skin was covered the bones. The cow has only one forelimb and a marked angulation was observed at the left front limb. There was no other abnormality diagnosed. In this study, monobrachial peromelia was reported by anatomo-pathological method in a two years old cow. This is the first monobrachial peromelia cow report in Turkey.

Keywords: Cow, monobrachial peromelia, pathology.

Holstein ırkı iki yaşlı bir danada monobrachial peromelia olgusu

Özet: Peromelia, ekstremitenin alt kısmının olmaması ile karakterize şiddetli bir konjenital anomalidir. Bu anomali hayvanlarda nadir görülür. İki yaşlı, Holstein danada sağ ön bacakta monobrachial peromelia olgusu gözlemlendi. Dana, kesimden önce ve sonra makropatolojik olarak incelendi. Hayvan klinik olarak sağlıklıydı ve vücut kondüsyonu iyiydi. Omuzdan radius ve ulna'ya kadar proksimal ekstremitte şekillenmişti. Normal skapula, hipoplazik humerus ile radius ve ulnanın proksimal bölümleri vardı. Kemiklerin üzeri normal deri ile kaplıydı. Dananın sadece tek bir ön bacağı vardı ve sol ön bacakta belirgin bir eğilme gözlemlendi. Bunun dışında hiçbir anormallik saptanmadı. Bu çalışmada iki yaşında bir danada monobrachial peromelia olgusu anatomo-patolojik olarak bildirilmiştir. Bu, Türkiye'deki bir danada saptanan ilk monobrachial peromelia raporudur.

Anahtar sözcükler: Dana, monobrachial peromelia, patoloji.

A number of different congenital anomalies are known to occur in domestic cattle (Noh et al., 2003; Newman et al., 1999). Congenital abnormalities may be multiple or may affect single parts of organ systems. Multiple congenital anomalies often occur because the malformation of one part of the body leads directly to the malformation of another part (Camon et al., 1990). Congenital limb reductions are relatively rare anomalies (Gellis, 1971). Anomalies of the limbs include amelia, micromelia, peromelia, polymelia and sirenomelia (Roberts, 1991). Peromelia, a term sometimes used synonymously with hemimelia, has been used to describe a syndrome characterized by agenesis of distal parts of the limbs. Phalanges and parts of the metacarpus or metatarsus on one or more limbs could be lacking in affected animals. Autosomal recessive inheritance is suspected. In isolated cases where the distal limb is absent, it is important to exclude the possibility that the

missing component was accidentally ingested by the dam when she was eating the placenta. This is most likely to occur in goats (Thompson, 2007). There are little reports about peromelia in calves (Smolec et al., 2011; Bahr et al., 2003; Szazados 1980; Rieck, 1976; Hare and Ballantyne, 1958). This is the first peromelia report in a cow in Turkey.

In a male, 2 years old Holstein cow monobrachial peromelia in the right forelimb was observed (Figure 1). Normal mass of muscle and connective tissues were palpated at the thoracal area. No lesion and pain were observed. The normal scapulae, hypoplastic humerus and slight radius ulna bone formations were palpable. During external examination no other abnormality detected. The thorax and ribs had normal constitution. The cow could walk and take food normally. The owner decided to slaughter when the cow becomes 2 years old. The cow examined gross pathologically before and after slaughter.



Figure 1: Gross appearance of the right forelimb peromelia in cow.
Şekil 1: Sağ ön bacak peromelili dananın görüntüsü.

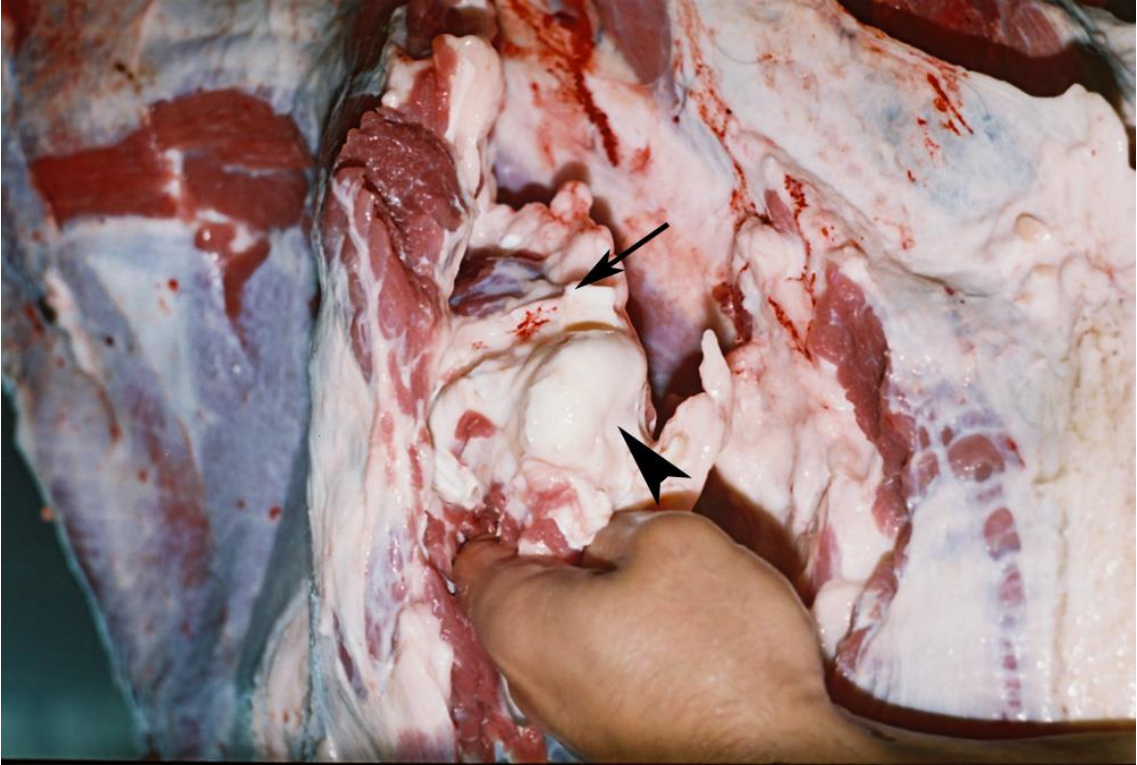


Figure 2: Hypoplastic humerus (arrow) and malformed radius ulna (arrow head) after slaughter.
Şekil 2: Kesim sonrası hipoplastik humerus (ok) ve malforme radius ulnanın (ok başı) görünümü.

Postmortem examination revealed the presence of normal scapulae, hypoplastic humerus and a lack of distal leg skeleton (Figure 2). On gross examination after slaughter, all of the internal organs were normal.

A congenital anomaly is defined as an abnormality of structure or function present at birth (Alam et al., 2007). Malformations are structural defects that occur during the embryonic period because of a localized error of development. Congenital defects affect from 0.25 to 3.0 percent of calves. About one-half of the abnormal fetuses are expelled dead or die shortly after birth. In nearly all cases of the defects are visible on examination. Most of the anomalies or defects involve skeletal, muscular and central nervous systems (Roberts, 1991). In this study peromelia was present at birth but the cow survived 2 years until slaughter.

Malformations of the extremities or parts of them are varied in their manifestations, ranging from absence of a single structure to partial or complete absence of the limbs (Lallo et al., 2001). Hemimelia is a congenital abnormality characterized by partial or complete absence of a portion of the normal structures in an extremity (Corbera et al., 2002). Peromelia is a failure of the distal appendicular parts to develop, while phocomelia refers to the absence of proximal appendicular parts. Tibial hemimelia refers to bilateral agenesis or maldevelopment of the tibia and patella (Singh and Tayal, 1996) or it is a developmental abnormality characterized by the lack of limb distal structures (Albarella, 2009) or in other word, is known as congenital amputation since proximally the malformed limb is normally developed while distally it is amputated at different points (Thompson, 2007). In this study the cow was born with an abnormal forelimb. The scapula was normal but humerus hypoplastic and radius - ulna were rudimentary. Because of the absence of the distal part of the leg, the malformation called as peromelia. In contrast a previous study (Mosbah et al., 2012) the cow could stand and live during the two years.

The cause the etiology of many congenital defects are unknown, some of them are inherited. A few congenital defects are known to be causal by genes with incomplete dominance and a few are caused by genes by two or more sets of genes. Many congenital defects are caused by environmental factors. These includes the level of nutrition, excess or shortages of certain nutrients, toxic plants or other toxic substances, infectious diseases and extremes in temperature during pregnancy (Gholap et al., 2014; Thompson 2007; Roberts, 1991; Leipold and Huston, 1983). Because of the cow couldn't examine genetically, the genotype of the animal remains unknown. However, the etiology of the current case was not clearly demonstrated, it may be considered that

various genetic and environmental factors related to the congenital anomaly in this calf.

During the embryonic stage of development, limbs arise as a condensation of cells from the lateral plate mesoderm and its ectodermal covering. The limb origin in amniotes develops from the wolffian ridges, which run along the lateral surface of the body (Al-Qattan et al., 1998). In this report no abnormality observed in other organ and tissues.

As a result a case of monobrachial peromelia reported anatomo-pathologically. To the best of author knowledge this is the first peromelia report in a cow in Turkey.

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