

## Accessory Tongue in a Calf <sup>[1]</sup>

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### Summary

This paper describes a case of accessory tongue in a male Brown Swiss crossbred calf. It was observed that the skull of calf was proportionally bigger as compared to the body, and the regions of head and neck were oedematous. The cavity of mouth was opened by cutting at the level of incisura vasorum. There was a normal tongue with 11.3 cm x 3.1 cm x 1.7 cm in size at the base of the cavity. However, surprisingly there was a further dark red coloured movable mass in 5.1 cm x 4.2 cm x 1.3 cm size at the inferior surface of 2/3 anterior part of lingual body located at the ventral side of tongue. There were papillae on the surface of normal tongue while, they were absent on the mass. Histopathological examinations of the mass revealed that there was an epithelial layer with no apparent overlying papillae and stratum corneum. Occasionally, inflammatory cells and hemorrhagic foci were observed in the lamina propria. The sections were also stained by Masson's trichrome method. It was concluded that the mass was a congenital malformations and actually an accessory tongue that is rarely seen in both humans and animals. The accessory tongue in the calf was also viewed by anaglyph technique.

**Keywords:** Accessory tongue, Calf, Anaglyph technique

## Bir Buzağıda Aksesuar Dil Olgusu

### Özet

Bu makalede bir İsviçre esmeri melezi buzağıda görülen aksesuar dil olgusu tanımlandı. Buzağıda kafanın vücuda oranla daha büyük şekillendiği, kafa ve boyun bölgesinin oldukça ödemli olduğu dikkat çekti. Ağız boşluğu incisura vasorum hizasından kesilerek ayrıldı. Ağız boşluğunun tabanında 11.3 cm x 3.1 cm x 1.7 cm boyutlarında normal bir dilin bulunduğu gözlemlendi. Ancak, dilin ventralinde, hareketli kısmın anterior 2/3 bölümü, inferior yüzeyinde 5.1 cm x 4.2 cm x 1.3 cm boyutlarında koyu kırmızı renkte bir oluşum dikkati çekti. Ayrıca, normal dil üzerinde bulunan papillalar, bu oluşum üzerinde gözlenmedi. Histopatolojik incelemede bu oluşumda normal bir dil epitelinin devam ettiği, buna karşın dil papillalarının ve stratum corneum'un çok belirgin olmadığı dikkati çekti. Lamina propriada yoğun kanama alanları ve yer yer yangı hücreleri gözlemlendi. Bu kesitler Masson's trichrome metodu ile de boyandı. Yapılan histopatolojik inceleme sonucunda bu kitlenin konjenital malformasyonlardan biri olan ve hem insanlarda hem de hayvanlarda nadir görülen aksesuar dil olduğu sonucuna varıldı. Ayrıca buzağıdaki aksesuar dil Anaglif tekniği kullanılarak görüntülendi.

**Anahtar sözcükler:** Aksesuar dil, Buzağı, Anaglif tekniği



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## INTRODUCTION

Structural and functional disorders of the newborns are defined as congenital anomalies. Genetic, environmental and stress related factors <sup>1,2</sup>, nutritional disorders <sup>3</sup>, teratogens, radiation, use of medicinal products during pregnancy, and erroneous selection of breeding animals <sup>1-4</sup> have been reported among reasons that cause such anomalies.

The tongue is formed by the fusion of three structures in the embryonic period. By the end of the fourth week, the anterior two-thirds of the tongue (oral part) develop from 2 distal and 1 median (tuberculum impar) tongue buds. These buds arise from the proliferation of the mesenchymal tissue of the first pair of pharyngeal (branchial) arches. The posterior, pharyngeal one-third of the tongue derives from two structures: the copula and hypobranchial eminence. These regions arise from the proliferation of the mesenchymal tissue of the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> pairs of pharyngeal arches. Following the formation of the tuberculum impar, two lateral swellings appear at both sides of the first pharyngeal (branchial) arch, which extend into the centre of the primary oral cavity. These are named the tuberculae linguae laterales. The lateral lingual structures develop rapidly and gradually cover the tuberculum impar. The three structures fuse to form the free part of the tongue which has the ability to move within the oral cavity. Generally the free part of the tongue derives from the tuberculum linguale laterale <sup>5</sup>. Any defect that occurs during the embryonic development in this period leads to various malformations. Double tongue, which is a rarely encountered anomaly, results from the development of the tongue from the lateral swelling (tuberculum linguale) in two parts <sup>5,6</sup>.

## CASE HISTORY

A newborn male Brown Swiss crossbred calf, which was referred to the Pathology Department of Atatürk University, Faculty of Veterinary Medicine for necropsy, constituted the study material.

Tissue samples taken from the calf at necropsy were fixed in 10% buffered formaldehyde. Fixed tissue samples were processed in accordance with routine methods and embedded in paraffin. Five-micron thick cross sections cut from these paraffin blocks were stained with Hematoxylin-Eosin (HE), and some other selected sections were applied Masson's

trichrome stain.

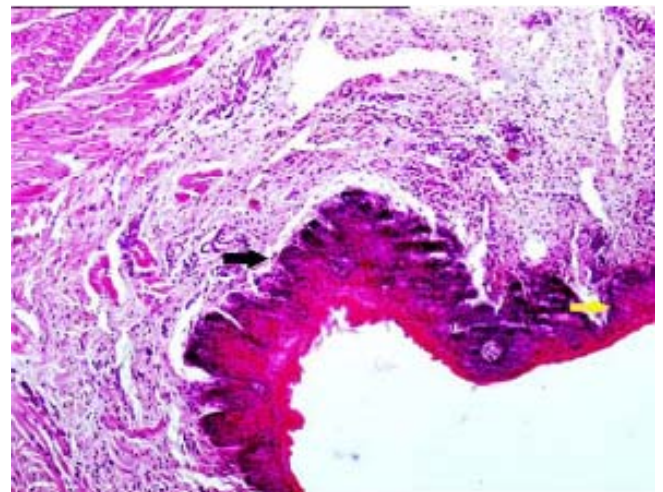
The head of the calf was large proportion to its body. The head and neck were rather oedematous. At necropsy, the oral cavity of the calf was cut at the level of the incisura vasorum. A normal tongue measuring 11.3 cm x 3.1 cm x 1.7 cm was observed to be situated at the base of the oral cavity. However, ventral to the tongue and situated on the inferior surface of the anterior two-thirds of the free part of the tongue, a dark red coloured mass, measuring 5.1 cm x 4.2 cm x 1.3 cm, was determined to exist (*Figure 1*).

Histopathological examination of the mass that revealed the normal tongue epithelium is present (*Figure 2,3*), yet the tongue papillae and the stratum corneum was not evident. Inflammatory cells and



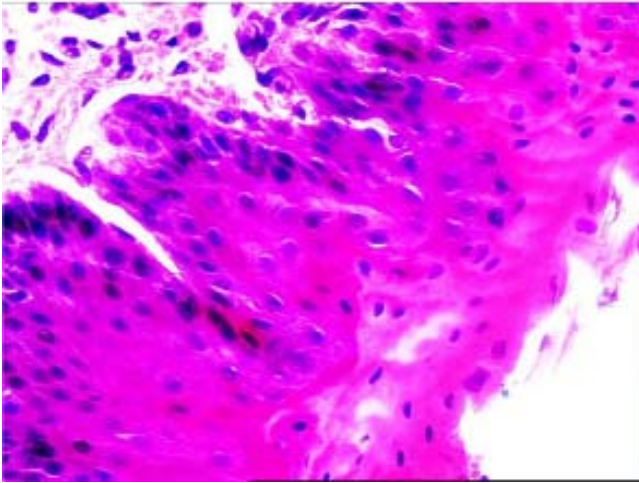
**Fig 1.** Accessory tongue located at the ventral part of the tongue

**Şekil 1.** Dilin ventral kısmına lokalize olan aksesuar dil



**Fig 2.** Epithelia of the normal (black arrow) and the accessory tongues (yellow arrow) HE, X 10

**Şekil 2.** Normal (siyah ok) ve aksesuar (sarı ok) dil epiteli HE, X 10



**Fig 3.** Illustrates the epithelium of the accessory tongues HE, X 40  
**Şekil 3.** Aksesuar dil epitelinin görünümü HE, X 40

several haemorrhages were observed in the lamina propria. These cross sections were also stained by Masson's trichrome method. In certain parts of the structure, muscle cells were observed to have started to develop. Besides, accessory tongue in calf was viewed three dimensionally by using anaglyph technique.

## DISCUSSION

In domestic animals, congenital anomalies present themselves in various types and severities<sup>7</sup>. The most frequently encountered anomalies are those of the skeleton-musculature, and digestive and central nervous systems, whereas disorders of the urogenital system, eyes and skin occur less frequently. The most common anomalies observed in cattle include arthrogryposis, hydrocephalus, dermoid cysts, atresia ani and recti, arqure, bouleture, hernia umbilicalis, and congenital cleft palate (palatochysis)<sup>4,8-11</sup>.

The accessory tongue is a congenital anomaly rarely encountered in humans and animals<sup>6,8,12,13</sup>. Based on their examinations on children, Bartholdson et al.<sup>6</sup> have reported double tongue to be encountered in one out of 50.000 children. To date, cases of double tongue in animals have been reported in a calf<sup>14</sup>, miniature donkey<sup>15</sup>, foals<sup>13</sup> and sparrow and parrot<sup>9</sup>. In the literature, the first case of accessory tongue in a calf was reported by Orhan et al.<sup>14</sup> Based on the results of research conducted, it has been determined that the majority of cases of double tongue in animals and particularly such cases in humans are associated with clefts of the palate<sup>6,8,9,13,15</sup>, disorders in the development of the brain or other anomalies<sup>8</sup>.

The histological structure of the accessory tongue displays similarity to that of the normal tongue<sup>12</sup>. In the present case, similarity in tissue morphology was also observed. However, no other anomaly was observed in addition to double tongue. As is the case in other anomalies of the tongue, double tongue may also inhibit the swallowing reflex<sup>13</sup>.

The frequency of anomalies varies with species, the environment in which the animal lives and various other factors. Since treatment is generally not preferred in cases of anomalies in animals, current knowledge of the frequency and types of congenital anomalies in animals is limited. However, it should not be understood that anomalies are encountered rarely in animals. In fact, the main problems related to this issue are the limited number of cases reported, the inadequacy of genetic analyses and insufficiency of anatomopathological research<sup>2,4</sup>. Recently, studies on congenital anomalies have increased, and thereby, attention has been drawn to the significance of this subject<sup>8,10,11,13</sup>.

In the present case study, the accessory tongue in a calf, which is a rare anomaly of both humans and animals, was histopathologically examined and reconstructed at three dimensional levels. Furthermore, since the calf was informed to have been conceived by artificial insemination, the necessity of tracing back to the bull was also underlined.

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