

Palatoschisis, brachygnathia inferior and accessory mandibular mass in a Simmental breed calf



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SUMMARY

Congenital anomalies in calves are encountered in different regions of the body. Generally, anomalies are seen in fronto-nasal, maxillar or mandibular regions. In addition several pathologies such as meningocele, cleft palate, nasal dermoid cyst, gingival vascular hamartoma are reported on the head. The aim of the present case report was to describe clinical and surgical result of palatoschisis, brachygnathia inferior and accessory mandibular mass in a Simmental calf. A 3-day-old male calf was referred with the complaint of milk discharge from the nose after suckling and an atypical structure in the mouth. At clinical examination, submandibular lymph nodes were swollen and physical examination results were normal. Oral examination revealed a cleft palate (palatoschisis), short lower jaw (brachygnathia inferior) and a pedunculated accessory mandibular mass midway between palatum durum and molle. However, the calf presented a good suction reflex. The accessory mandible was connected to the cleft palate and contained tooth-like structures. At palpation, the end portion of this mass was hard while its peduncle was soft in consistency. Radiographic exams on latero-lateral and ventro-dorsal projections of the cranium were carried out. The patient was subjected to surgical treatment; it was sedated with xylazine chloridrate (0.1 mg/kg im) and general anaesthesia was induced with ketamine chloridrate (4 mg/kg im). After tracheal intubation, general anesthesia was maintained with 2% isoflurane plus oxygen. The accessory mandible was removed by dissecting the surrounding tissues. Congenital cleft was closed through application of n° 0 suture silk with simple interrupted stitches. On the following day, the calf was discharged from the clinic with a post-operative recommended therapy including antibiotics (penicillin-streptomycin, 1×1.5 cc, im, for 5 days), analgesic (flunixin meglumin, 1.1 mg/kg, iv, for 3 days) and oral antiseptic (10% glycerin iode) drugs. According to the information obtained from the owner on the 15th postoperative day, calf's appetite was normal and chewing movements were reported to be relatively good. As a result, multiple anomaly including palatoschisis, brachygnathia inferior and accessory mandible in a calf may occurred in clinical practice and as in this case, the observed pathology was corrected by surgical intervention, and postoperative results were favorable.

KEY WORDS

Accessory mandible, brachygnathia inferior, calf, palatoschisis, surgical repair.

CASE HISTORY

Different types of congenital anomalies are observed in farm animals. Congenital anomalies in calves are encountered between 0.2-3.6%^{1,2}. In general, the causes of the anomalies are reported as genetic and environmental factors^{3,4}. Particularly, at the beginning of organogenesis, maternal protein and vitamin deficiencies, infectious diseases, radiation, folic acid deficiency, teratogens such as lupine and endocrine disorders lead to anomaly formation^{1,3,5}.

Among congenital anomalies, fronto-nasal, maxillar and mandibular defects are observed in the facial region. The cleft palate (palatoschisis) may be of different size in the palatum durum and palatum molle of calves. Depending on the size and location of the cleft, nasal turbinates may be seen from the congenital cleft and nasal regurgitation is the most typical finding in these cases. Aspiration pneumonia is en-

countered due to milk aspiration⁶. Diagnosis is made on the basis of anamnesis and oral examination⁴. Brachygnathia inferior is defined as the mandible being shorter than the maxilla. This anomaly is a cranio-facial defect caused by homozygous recessive genes with incomplete penetration and various degrees of expression. It is mostly observed in horses, sheep, goats and cows⁷.

Congenital masses are rarely observed in cattle that these masses may have different appearance and shape¹. Although many pathologies are seen on the cranial region^{8,9}, meningocele is the most common congenital cranial anomaly in calves¹⁰.

In this case report, it was aimed to report palatoschisis, brachygnathia inferior and accessory mandibular mass observed in a Simmental calf.

A 3-day-old, 52 kg body weight, male Simmental breed calf was referred to Bursa Uludag University Faculty of Veterinary Medicine, Department of Surgery Clinics with the complaint of a swelling in the month. In the anamnesis, the owner informed that the calf was born normally and he had an abnormal mass in the mouth of calf. In addition, while the calf was feeding, there was difficulty swallowing and milk was nasally discharging

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Figure 1 - Clinical appearance of the case, star: accessory mandibular mass, arrow: palatoschisis (cleft palate).

after sucking. The referred veterinarian had administered some drugs to support the calf healthy status, and then the calf was brought to our clinics.

At physical examination, vital parameters (pulsation: 108/min, respiration: 24/min, body temperature: 37.6, capillary refilling time: 1 sec, mucous membrane color: normal) were normal but submandibular lymph nodes were swollen. Inspection revealed a cleft that begins at the middle of the hard palate and separated the soft palate longitudinally, and a formation covered with tooth-like structures on the left side of the cleft, with a mandibular appearance associated with soft tissue (Figure 1). During occlusion, the mandible was shorter than the maxilla (brachygnathia inferior). At palpation, it was determined that the end part of this tissue was hard and the bottom part

Table 1 - Hematological results of the case.

Parameters	Values	Reference
WBC ($10^9/L$)	9.19	4-12
LYM ($10^9/L$)	6.42	2.5-7.5
MON ($10^9/L$)	0.22	0-0.84
NEU ($10^9/L$)	2.25	0.6-6.7
EOS ($10^9/L$)	-	-
BAS ($10^9/L$)	-	-
RBC ($10^{12}/L$)	7.56	5-10
HGB (g/dl)	10.9	8-15
HCT (%)	33.20	24-46
MCV (fl)	41	40-60
MCH (pg)	11.5	11-17
MCHC (g/dl)	32.8	30-36
PLT ($10^9/L$)	278	100-800
PCT (%)	0.13	-

WBC: White blood cell LYM: Lymphocytes, MON: Monocytes, NEU: Neutrophil, EOS: Eosinophil, BAS: Basophil, RBC: Red blood cell, HGB: Hemoglobin, HCT: Hematocrit, MCV: Mean corpuscular volume, MCH: Mean corpuscular hemoglobin, MCHC: Mean corpuscular hemoglobin concentration, PLT: Platelet, PCT: Plateletcrit.

had soft consistency. In hematological examination, the results were in the normal reference values (Table 1). Radiologically, lateral and ventrodorsal radiographs of the cranium showed multiple radiopaque tooth-like structure on the mass and anomalous portion of the mandible relative to the maxilla (Figure 2). Apart from oral pathologies, no other pathology was found clinically and radiologically in the calf. After informing the owner about the pathology, a surgical intervention was decided to be performed.

Calf was sedated with xylazine chlorhydrate (0.1 mg/kg, im) (Alfazyme[®], Egevet, TURKEY) and ketamine chlorhydrate (4 mg/kg, im) (Alfamime[®], Egevet, TURKEY) was administered for induction. After tracheal intubation, general anesthesia was maintained with 2% isoflurane plus oxygen. Oral examination was repeated under general anesthesia and the size of the cleft and the position of the mandibular mass were determined. It was observed that the mass was attached to the left side of the soft palate and the cleft on the hard palate was also extending

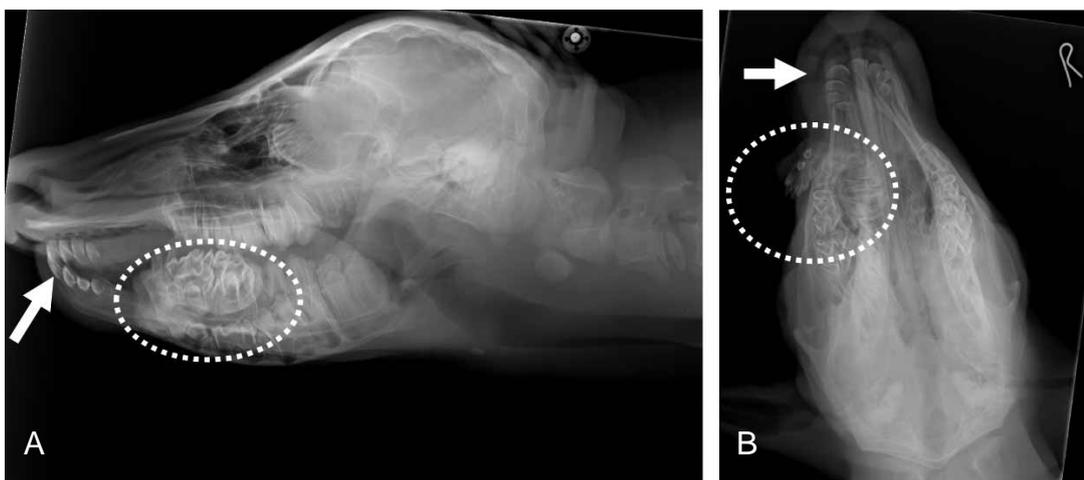


Figure 2 - In the lateral (A) and ventrodorsal (B) radiographs of cranium, brachygnathia inferior (arrow) and accessory mandibular mass (dashed line).



Figure 3 - Postoperative image of calf, PD: palatum durum.

to the soft palate. After the calf was placed ventrodorsally on the operation table, antisepsis was provided inside the mouth and the area was limited by means of sterile covers. The accessory mass was excised from the region where it was attached to the cleft on the palate, and was dissected from the surrounding tissues. During the removal of the mass from the area where it was attached to the soft palate, some mucosal tissue on the mass was separated and this tissue was used as a flap to close the cleft in the palate with n° 0 absorbable suture material (Figure 3). At day 1 postoperative, 5% dextrose and 0.9% isotonic NaCl solutions were given 2 times a day intravenously, and the calf was fed 2 times a day with 2 liters of milk with a stomach catheter. Postoperative penicillin-streptomycin (1.5 ml, im, one a day) (Vetimisin, Vetas, TURKEY), flunixin meglumin (1.1 mg/kg, iv) (Fulimed, Alke®, TURKEY) and oral antiseptic (10% glycerin iode, Mervet, Turkey) treatments were administered. These medications and oral feeding with stomach catheter for 5 days were recommended to the calf owner, and then the calf was discharged one day later. According to the information obtained from the owner on the 15th postoperative day, the calf was able to feed and drink water normally and chewing movements were reported to be relatively good.

DISCUSSION

Congenital anomalies arise from developmental problems in the embryonal period⁵. In recent years, up to 300 of congenital anomalies have been reported in worldwide literatures¹¹. Herein, a case with different anomalies such as palatoschisis,

brachygnathia inferior and mandibular anomaly was detected and reported in a Simmental calf.

The specific cause of most of the anomalies observed in animals is not clear. Anomalies include many pathological conditions from single organ disorders to multiple organ failure¹. The facial clefts are due to lack of fusion^{3,5,12} and are usually seen in the lip, chin and palate¹². The palate and cleft lip are usually associated with other disorders such as arthrogryposis, congenital joint contracture, muscular dystrophy³. Palatoschisis occurred in Sharole and Hereford cows with arthrogryposis⁴. Palatoschisis and brachygnathia inferior are two different developmental diseases observed in calves¹³. As a result of clinical and radiological examinations, no pathology other than the head region was observed. In our case, the reason of the pathologies we encountered in the head region is not known exactly, but when the health status of the region where the animals live is evaluated, it is thought to be genetically related to the lack of fusion in the maxilla.

Palatum molle is an anatomical structure which plays a vital role in oral and pharyngeal phase of swallowing, preventing leakage with tongue and preventing aspiration of liquid and solid foods. It provides a mechanical and physical barrier between oral and nasal cavity⁴. In palatoschisis, the clinical findings are observed immediately after birth and during the suckling. Bilateral nasal discharge, cough and dysphagia are characteristic findings. In addition, passive immune transfer failure, aspiration pneumonia, growth retardation, chronic bilateral nasal discharge and food regurgitation are seen in patient with palatoschisis. Sometimes nasal turbinates are also observed in the oral cavity during inspection^{4,6}. Palatoschisis is diagnosed by oral examination and it is possible to monitor the patency by means of endoscopy⁴. Our case was presented to our clinic with good general condition with bilateral nasal discharge and dysphagia. Surgical repair of the defect is performed⁴. There are laryngotomy, mandibular symphysiotomy, pharyngotomy and intraoral surgical approach techniques to close the cleft palate. The use of techniques varies according to the size of the cleft and mandibular symphysiotomy is said to be the best approach method in large clefts¹⁴. In addition, treatment should be directed considering the secondary pathologies of the patient such as malnutrition, aspiration pneumonia and passive immune transfer failure. There are few cases with positive results from treatment, but postoperative complications are possible⁴. Postoperative complication rate due to saliva is high in cases with cleft palate. These complications include dehiscence of the surgical wound, aspiration pneumonia, osteomyelitis and soft tissue infection¹⁴. Depending on the size of the cleft in the palate, the opening in the hard and soft palate can be surgically corrected³. In a case with multiple anomalies undergoing surgical intervention, the majority of the opening was closed and no complications were encountered, but the animal died 2 days later due to complications related to other anomalies¹¹. Uncomplicated recovery was achieved by surgical intervention in another calf shaped Cheiloschisis¹⁵. Patients can survive for a long time after successful operative intervention². Accessory mandible and palate cleft cases observed in humans are corrected by surgical repair¹⁶. In this case, the mandibular mass was removed with the operative intervention and the opening of the palate was repaired. Due to the small size of the cleft palate and the mass associated with the soft palate, it reduced the likelihood of complications in the postoperative period. It was reported by the owner that mouth movements, feed and water

intake improved in 15 days postsurgery.

Brachygnathia inferior may be associated with different anomalies such as polydactylism¹⁷ and hydrocephalus¹⁸ in calves. Dental problems, malnutrition, growth retardation and even death may occur due to the fact that chewing is abnormal. Generally, genetic selection should be done very carefully in flocks with such animals¹⁷. In our case, mouth movements were found to be better than preoperative, and calf growth was reported to be normal.

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