IMPACTO CIENTÍFICO EDITORA

PALATOSCHISIS IN SMALL NEONATES – LITERATURE REVIEW

PALATOSQUISE EM NEONATOS DE PEQUENO PORTE – REVISÃO DA LITERATURA

PALATOSQUISIS EN NEONATOS PEQUEÑOS – REVISIÓN DE LA LITERATURA

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ABSTRACT

Cleft palate results from the incomplete fusion of the palatal processes during embryogenesis, leading to the formation of a longitudinal fissure in the hard and/or soft palate. This condition may occur in isolation or be associated with other congenital anomalies, resulting in an abnormal communication between the oral and nasal cavities. It can be either congenital or acquired. The main objective of this study was to address neonatal canine cleft palate in small animals, using a literature review from scientific databases as the methodological approach. Failure in the fusion of the palatal plates impairs suckling in neonates by preventing the generation of adequate negative pressure for nursing. This may lead to aspiration of food and result in pulmonary infections, coughing, vomiting, and nasal reflux during feeding—representing one of the leading causes of mortality. The treatment of cleft palate is primarily surgical. However, due to the high incidence of this condition, it is essential to determine the most appropriate timing for surgical intervention, taking into consideration the patient's immune status, surgical risks, and stage of craniofacial development. Various surgical techniques are described in the literature, and the choice of method depends on the clinical condition of the patient, as well as the location and type of cleft palate. Preventive measures, such as raising awareness among pet owners and controlling the breeding of severely affected individuals, are crucial to reducing the incidence of this condition and ensuring the well-being of predisposed breeds. Immediate evaluation of neonates at birth is critical, as it allows for early clinical intervention, which contributes to improved prognosis and reduced mortality. Thorough clinical examination is therefore essential, with careful observation of the animal's responses to its environment. It is hoped that the present study will contribute to future research, new therapeutic approaches, and preventive strategies.

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Keywords: Cleft Palate. Canine. Palate. Neonatal. Palatoschisis.

RESUMO

A fenda palatina, resulta da fusão incompleta dos processos palatinos durante a embriogênese, levando à formação de uma fissura longitudinal no palato duro e/ou mole. Essa condição pode ocorrer isoladamente ou em associação com outras anomalias congênitas, ocasionando a comunicação da cavidade oral com a cavidade nasal, podendo ser congênita ou adquirida. O objetivo principal foi abordar a fenda palatina neonatal canina em pequenos animais. Utilizando como metodologia a revisão da literatura em bases de dados. A falha no fechamento das placas palatinas dificulta a sucção em neonatos, impedindo a criação de pressão negativa para mamar. Isso pode levar à aspiração de alimentos e causar infecções pulmonares, tosse, vômito e refluxo nasal durante a alimentação. Sendo um dos maiores causadores de mortes. O tratamento da fissura palatina é essencialmente cirúrgico. Contudo, devido à alta incidência dessa afecção, é fundamental determinar o momento mais adequado para a intervenção, levando em conta o estado do sistema imunológico, o risco cirúrgico envolvido e a fase do desenvolvimento craniofacial do paciente. Diversas técnicas cirúrgicas estão descritas na literatura, sendo a escolha do método dependente das condições clínicas do paciente, bem como da localização e do tipo de fenda palatina apresentada. Ações preventivas, como a conscientização dos responsáveis pelos animais e o controle da reprodução de indivíduos gravemente acometidos, são essenciais para reduzir a ocorrência dessa condição e garantir o bem-estar das raças mais predispostas. A avaliação imediata dos neonatos ao nascimento é fundamental, pois permite a implementação precoce de intervenções clínicas, o que contribui para a melhora do prognóstico e redução da taxa de mortalidade. Tornando fundamental realizar um exame clínico de forma minuciosa, observando cuidadosamente as respostas do animal ao meio ambiente. Espera-se que o presente estudo contribua para novas pesquisas, novas abordagens terapêuticas e estratégias preventivas.

Palavras-chave: Fenda Palatina. Canino. Palato. Neonatal. Palatosquise.

RESUMEN

El paladar hendido resulta de la fusión incompleta de los procesos palatinos durante la embriogénesis, lo que lleva a la formación de una hendidura longitudinal en el paladar duro y/o blando. Esta afección puede presentarse sola o asociada a otras anomalías congénitas, lo que provoca la comunicación entre la cavidad oral y la cavidad nasal, y puede ser congénita o adquirida. El objetivo principal fue abordar el paladar hendido neonatal canino en pequeños animales, utilizando como metodología una revisión bibliográfica en bases de datos. La falta de cierre de las láminas palatinas dificulta la succión en los neonatos, impidiendo la creación de presión negativa para la succión. Esto puede provocar aspiración de alimentos y causar infecciones pulmonares, tos, vómitos y reflujo nasal durante la alimentación. Es una de las principales causas de muerte. El tratamiento del paladar hendido es esencialmente quirúrgico. Sin embargo, debido a la alta incidencia de esta afección, es fundamental determinar el momento más adecuado para la intervención, teniendo en cuenta el estado del sistema inmunitario, el riesgo quirúrgico y la etapa de desarrollo craneofacial del paciente. Se describen diversas técnicas quirúrgicas en la literatura, y la elección del método depende del estado clínico del paciente, así como de la localización y el tipo de fisura palatina. Las medidas preventivas, como la concienciación de los propietarios de animales y el control de la reproducción de los individuos gravemente afectados, son esenciales para reducir la incidencia de esta afección y garantizar el bienestar de las razas más predispuestas. La evaluación temprana de los recién nacidos al nacer es crucial, ya que

permite la implementación temprana de intervenciones clínicas, lo que contribuye a un mejor pronóstico y a una reducción de la mortalidad. Por ello, es fundamental realizar un examen clínico exhaustivo, observando cuidadosamente las respuestas del animal al entorno. Se espera que este estudio contribuya a futuras investigaciones, nuevos enfoques terapéuticos y estrategias preventivas.

Palabras clave: Fisura Palatina. Canino. Paladar. Neonatal. Palatosquisis.

1 INTRODUCTION

In the neonatal period, some species, such as the canine, present significant physiological, chemical and microbiological changes, resulting from the transition from the uterine environment to the external environment and the immaturity of several physiological pathways. These changes make neonates more vulnerable to adverse conditions, directly impacting their survival. In addition, maternal disorders during pregnancy directly influence the appearance of malformations or congenital defects, increasing the mortality rate in the first weeks of life (CASTELETI, 2022).

Among the most frequently related congenital malformations in canine neonates, cleft palate stands out, which can be called palatoschisis, an anomaly that compromises the integrity of the palate and establishes an abnormal communication between the oral and nasal cavities. These conditions can be caused by a combination of genetic, environmental, nutritional, and hormonal factors, in addition to the use of certain medications during pregnancy (NAMMUR, 2020; FREITAS, 2023).

Cleft palate results from the incomplete fusion of the palatal processes during embryogenesis, leading to the formation of a longitudinal fissure in the hard and/or soft palate. This condition can occur alone or in association with other congenital anomalies, such as cleft delays (NUNES, 2015).

The severity of the clinical picture varies according to the extent of the cleft, and neonates with palatoschisis have great difficulty in sucking breast milk, becoming highly dependent on intensive care. Artificial feeding, through esophageal tubes or special bottles, becomes essential to ensure adequate nutritional transport and the survival of the puppy (SOUSA, 2020).

In most cases, spontaneous healing of the cleft palate is rare, making surgical repair the main therapeutic alternative. However, due to the physiological conditions of the oral and nasal cavity — such as the constant presence of saliva, food debris, bacterial colonization, and the continuous movement of the tongue — a surgical success rate may be limited (JUNIOR, 2022).

Surgical correction of the cleft palate aims at anatomical and functional supervision of the palate, reestablishing the separation between the oral and nasal cavity. Among the various techniques available, the most commonly used include overlapping flap and bipedicled retail penetration. The choice of surgical approach depends on factors such as the extent of the cleft, the age of the animal, the condition of the adjacent tissues, and the presence of other associated complications (DIAS, 2015).

Thus, the treatment of congenital conditions, such as cleft palate, represents a significant clinical and surgical challenge. A multidisciplinary approach, which involves neonatology, nutrition, surgery, and postoperative care, is essential to increase the chances of therapeutic success and provide a better quality of life for affected animals. Studies indicate that early detection, associated with proper management, can significantly reduce the neonatal mortality rate and minimize the negative impacts of this condition on the development of the puppy (CUNHA, 2021).

Veterinary monitoring from birth, associated with thorough clinical examinations, contributes to the improvement of neonatal management protocols, reducing mortality rates and promoting a higher quality of life for affected animals. Due to the lack of approach to the theme, this study is justified by the need to expand knowledge about the impact of early diagnosis and treatment of neonatal cleft palate, in order to achieve, albeit modestly, a probable solution, or a new interpretation, more systematic and logical, improving veterinary medical conducts and providing better prognosis to affected patients.

Congenital cleft palate is a condition of great relevance in veterinary medicine, especially in purebred and brachycephalic breeds, which have a greater genetic predisposition. The absence of early diagnosis and appropriate management can severely compromise the survival of neonates. In view of this, the following question arises: What is the importance of early diagnosis of neonatal cleft palate in small animals and how can early identification impact management and treatment strategies, increasing the chances of survival and quality of life of affected offspring?

The main objective of this study was to address canine neonatal cleft palate in small animals. For this, specific objectives were sought, such as: Describe a history of the cleft palate, anatomy and morphological aspects; point out the pathophysiology, clinical signs and diagnostic method; describe forms of treatment and appropriate management.

2 METHODOLOGY

This study was carried out through a literature review. The Virtual Health Library (VHL) database was used, which contains publications from the sources of Health Sciences in General, such as: Latin American Literature in Health Sciences (LILACS), International Literature in Health Sciences (MEDLINE) and Scientifc Electronic Library Online (SCIELO) and also specialized areas such as the Bibliographic Database referring to the proposed theme.

The following criteria for selecting articles that carried out systematic research include the following: Palatoschise; Canines; congenital defects from the year 2010 to 2025, carrying

out the survey of these 15 years of bibliographic research produced that were used for research in small canine cleft palates.

3 LITERATURE REVIEW

3.1 HISTORY, ANATOMY AND MORPHOLOGICAL ASPECTS OF CLEFT PALATE

Cleft palate in animals is a rare condition, while in humans it occurs in approximately one in every 650 births, and is considered the most well-known craniofacial anomaly. In animals, primary and secondary defects can occur simultaneously, which have different etiological origins, involving different periods and processes of embryonic development (SOUSA, 2020). It may have an incidence of 3%, so that, for every 33 dogs born, one will manifest this congenital defect (LOCATELLI, 2025).

Congenital anomalies generally consist of malformations that can be detected during pregnancy or shortly after birth. The neonatal period, which covers approximately the first two weeks of life of small animals, is particularly critical for the identification of these changes. Such anomalies involve modifications in the structure and/or function of tissues, organs or systems, and may result in structural and functional impairments. Its origin is associated with genetic, environmental, infectious, nutritional factors or the interaction between these various factors (SOUSA, 2020).

Anatomically, the palate is divided into two parts: the hard palate, located in the rostral portion and formed by bones, and the soft palate, located in the caudal portion and composed of musculature. The hard palate is made up of the palatine processes of the maxillary bones and incisor bones, while the soft palate is made up of muscles, including the palatine muscle and the levator veli palatine muscle. hard and/or soft palate, causing abnormal communication between the oral and nasal cavities (MOTHÉ, 2024; REIS, 2025).

Palate embryogenesis begins from structures originating from the migration of neural crest cells, which play an essential role in the formation of facial structures (CASTELI, 2022).

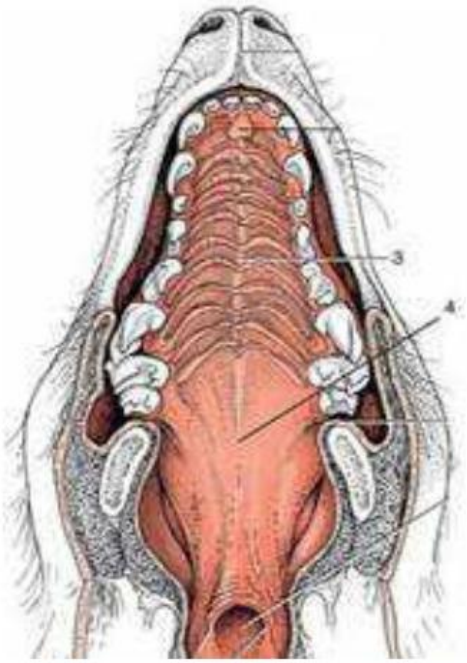
According to McGeady et al. (2017), The nasal cavities, surrounded by the medial and lateral prominences, penetrate the mesenchyme of the frontonasal process, between the forming forebrain and the oral cavity. Congenital anomalies may occur due to failures in the fusion of mesenchymal tissues of migratory embryonic processes, compromising the integration of facial structures. With the deepening of the fossae, the nasal sacs are formed, initially separated from each other by a septum and from the oral cavity by an oro-nasal membrane, which originates the primary palate. At this stage, there is communication between the nasal and oral cavity by choana. Between the fourth and eighth week, the palatal process grows from the lateral walls of the nasal cavity. The retreat of the tongue allows the

expansion and union of the palatine processes in the midline, forming the secondary palate and separating the oral and nasal cavities.

The anterior region of the secondary palate joins the maxillary process and, initially composed of membranous tissue, undergoes an ossification process in its frontal two-thirds, giving rise to the hard palate. The part that extends towards the pharynx remains as membranous tissue, forming the soft palate. In domestic animals, this structure constitutes the roof of the oral cavity and develops convex protrusions or wrinkles, which can contribute to the direction of food towards the pharynx (MCGEADY et al 2017; CASTELI, 2022).

Figure 1

Illustrative image of the dog's oral cavity, showing the hard (3) and soft (4) palate



Source: Adapted Vieira 2019.

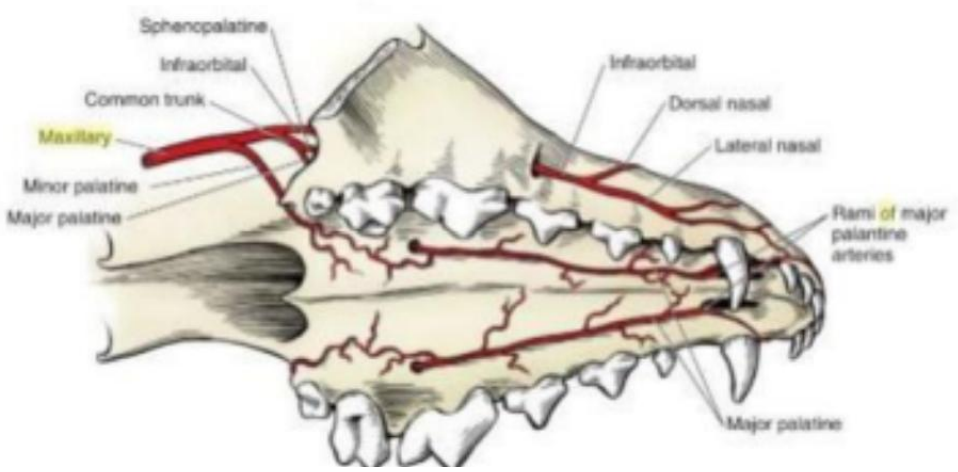
The hard palate is formed by the palatine processes of the maxilla, the incisor bones, and the horizontal lamina of the palatine bone. It has an oral surface, covered by thick, cornified mucosa with 6 to 10 palatine wrinkles, delimited by the dental alveoli, and a nasal surface. The soft palate, located caudally to the hard palate (from the molar region), is made up of mucosa with longitudinal and transverse folds, salivary glands and muscle aponeuroses. Its mobility is guaranteed by the palatine (shortens), tensor (tenses) and levator (elevates) muscles. The innervation of the soft palate and pharyngeal mucous membranes occurs mainly through the vagus nerve and, to a lesser extent, through the glossopharyngeus, while the tensor muscle is innervated by the mandibular nerve (FREITAS, 2023).

Thus, the soft palate is located caudally, composed of muscle and connective tissue covered by thin mucosa. It begins at the height of the maxillary last molar and extends to the intrapharyngeal ostium, being partially hidden by mucosal folds. It is mobile and actively acts in swallowing, sealing the passage to the nasal cavity and preventing aspiration, in addition to participating in localization and breathing in dogs. Irrigation of the palates is done through the palatine arteries, with drainage through the mandibular lymph nodes, and innervation through the glossopharyngeal and vagus nerves. Its musculature includes the palatine, tensor and levator palate muscles (SOUSA, 2020; MOTHÉ, 2024).

The maxillary artery originates branches that irrigate the palate, such as the greater and lesser palatine, infraorbital, and sphenopalatine arteries, which reach the oral cavity through specific foramina: the caudal palatine foramen (greater palatine artery), the maxillary foramen (infraorbital artery), and the sphenopalatine foramen (sphenopalatine artery). Lesions in these vessels can cause hemorrhages and mucosal dehiscence. The greater palatine artery also irrigates regions such as the nasal area of the palate and the interdental space between incisors and canines, in addition to anastomosing with its counterpart Venous drainage occurs caudally, through a spongy and poorly developed venous plexus in the hard palate, which extends to the soft palate and empties into the maxillary vein (FREITAS, 2023).

Figure 2

Illustrative image of the main palatine vessels and foramina



Source: Adapted Freitas 2023

Therefore, this multifactorial malformation has a genetic predisposition that is continuously affected by environmental factors during embryonic development. (MCGEADY et al, 2017).

Consanguinity, or inbreeding, is an important risk factor for the occurrence of congenital anomalies, since it promotes the reduction of genetic variability and the increase of homozygosity in the descendants. This genetic condition favors the expression of deleterious recessive alleles, significantly increasing the probability of malformations. In view of the suspicion of hereditary involvement, it is recommended that animals carrying such deformities be excluded from breeding programs, in order to avoid the perpetuation of these genetic alterations in the population. Representing approximately 84% of cases in purebred puppies (LOCATELLI, 2025).

3.2 PATHOPHYSIOLOGY, CLINICAL SIGNS AND MEANS OF DIAGNOSIS OF CLEFT PALATE

The cleft can have a congenital or acquired origin. The development of cleft palate can have a hereditary origin, being the result of a dominant gene or a recessive trait. This congenital defect occurs due to the non-fusion of the anatomical structures responsible for the separation between the oral and nasal cavities, such as the palatine bones, the oral mucosa, the incisor bones, and the maxilla. This failure causes abnormal communication between the cavities, compromising the animal's well-being and can be fatal if not treated properly (VIEIRA, 2019;).

However, acquired malformations can be the result of trauma, chronic infections, removing teeth or other odontopathies, or even secondary to previous surgical procedures, radiotherapy or neoplasms (SOUSA, 2020).

The birth defect occurs due to the failure of the fusion of the anatomical structures responsible for separating the oral and nasal cavities, such as the palatine bones, the oral mucosa, the incisor bones, and the maxilla. This anomaly generates communication between the cavities, which compromises the animal's well-being and can be fatal if not treated properly (FREITAS, 2023).

In some breeds, palatoschisis in brachycephalic dogs and purebreds are at greater risk than others. However, breeds such as beagles, cocker spaniels, dachshunds, schnauzers, boxers, Pekingese and English bulldogs may show an increase in masformations. Regarding sex predisposition, females are more affected (DIAS, 2015; LOPES, 2019; JUNIOR, 2022; VIEIRA, 2019).

According to Maciel (2023) the incidence is 3.7%, being found not only in brachycephalic breeds (French Bulldog, Bulldog, American Bully and Pug), but also in German Spitz. With prevalence in the French Bulldog breed with a percentage of 65%.

According to Lopes (2019), domestic animals have an average occurrence of palatoschisis of 0.6 cases per thousand births.

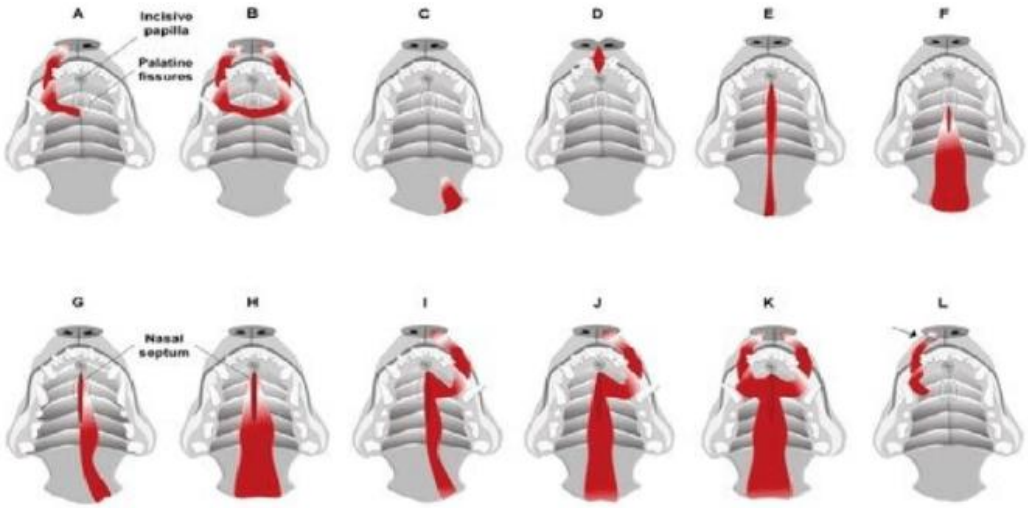
Several teratogenic factors can influence the development of orofacial congenital anomalies, including hereditary predisposition, consanguinity, and advanced age of the parents. In addition to these, environmental and nutritional aspects also play a relevant role, such as unbalanced diets, especially those with a deficiency of B vitamins, such as B2, B6 and folic acid, as well as excessive consumption of vitamins A and D. Other risk factors include exposure to ionizing radiation, infections such as toxoplasmosis, hyperthermia, maternal stress, ingestion of toxic plants and hormonal changes. Studies show that folic acid supplementation, at a dosage of 5.0 mg per day during pregnancy in, has the potential to reduce the occurrence of cleft palate in neonates, since the nutrient acts to prevent neural tube defects (NAMMUR, 2020; PEREIRA, 2019; LOCATELLI, 2025).

In addition, certain classes of drugs, such as antibiotics (penicillins, ampicillin, and tetracycline, anti-inflammatory drugs (diclofenac sodium and potassium), antifungals (nystatin), and bronchodilators (salbutamol and fenotemol) have teratogenic potential and can cause orofacial changes (CASAL, 2016; MACIEL, 2023).

Clinical signs include difficulty breastfeeding, regurgitation through the nose, sneezing, presence of nasal discharge, frequent respiratory infections, cough, difficulty breathing, dysphagia, weight loss, and dehydration (MOTHÉ, 2024). It may vary according to the degree of opening in the palate, obtaining palatoschisis directly affects the animal as the importance of milk intake at this stage that the tutor is responsible for helping the neonate, for the tutor it is a great responsibility since he needs to feed him frequently through a tube, because the animal that presents this structural deformation cannot feed itself, (SOUSA, 2020).

Figure 3

Illustrative image of the classification of cleft palate



Source: Adapted Freitas (2023).

The difficulty present in sucking milk is directly associated with the intensity of incomplete closure of the palatine bone plates, consequently making it impossible for some neonates to create adequate negative pressure to breastfeed. Pulmonary infections can occur in neonates due to aspiration of food, coughing, induction of vomiting, and sneezing due to nasal reflux through feeding (CASTELLI, 2022).

With low or no digested food content in the stomach, it is likely that the puppy will not be able to suck and ingest. Weakness is one of the causes of cleft palate, since animals with the presence of cleft manifest a lack of ability to initiate a negative pressure in the mouth, causing inability to suction. Small animals with feeding problems are likely to develop more quickly a cause of cachexia, aspiration pneumonia, infections, progressive weight loss, underdevelopment, inflammation in the respiratory tract, malnutrition, hypoglycemia that can evolve to death by starvation, presenting the lack of reserves for its continuation, the monitoring of the veterinarian becomes indispensable in these cases (FREITAS, 2023).

Another relevant aspect that can lead to the death of these animals is the appearance of pneumonia, since the cleft palate, depending on its location, can facilitate the entry of microorganisms from the oral cavity into the airways, reaching even the lungs (VIEIRA, 2019).

The mortality rate is extremely high, reaching 90% of those affected, especially in cases that do not have early assistance and treatment. Early diagnosis has become essential to increase the chances of survival (LOCATELLI, 2025).

However, the diagnosis of cleft palate is based on anamnesis and a careful and detailed inspection of the oral cavity, with the aim of excluding the presence of cleft lip and

palate or other associated congenital malformations. It is not necessary to perform cranial X-rays to identify the complete separation of the palatine bones (DIAS, 2015; NAMMUR, 2020).

However, complementary exams such as imaging, ultrasound and x-ray will be necessary in case the animal presents unusual respiratory signs, such as crackles and pneumonia. Laboratory tests will only be necessary if the patient is cachectic or has pneumonia (PANKOWSKI, 2018; MACÁRIO, 2021).

The prognosis is considered unfavorable in cases of neonates due to the difficulty of providing adequate food for the animal to reach the size necessary for surgery. Therefore, animals that are fed by tube until they reach the necessary size have a good prognosis (BEZERRA, 2019).

In these cases, clinical support will be necessary, which consists of tube feeding to maintain an adequate nutritional status until the animal reaches sufficient age to undergo surgical intervention (NAMMUR, 2020).

3.3 DESCRIBE FORMS OF TREATMENT AND PROPER MANAGEMENT OF CLEFT PALATE

The treatment aimed at a better quality of life consists of surgical correction of the palate, in order to restore its functional anatomy and promote complete separation between the oral and nasal cavities. Reconstructive surgery is recommended from three months of age, when the patient already has adequate organic conditions to withstand general anesthesia and has a sufficient amount of mucoperiosteal tissue to cover the cleft (NAMMUR, 2020; MOTHÉ, 2024).

Surgical interventions performed in the first years of life of animals are more efficient, in turn reducing the chances of secondary complications, such as pulmonary hypertension and right heart failure. Thus, support after surgery is essential, encompassing oxygen therapy, appropriate analgesia, and constant respiratory monitoring (REIS, 2025).

Neonates who have not undergone surgery are usually euthanized or die from aspiration pneumonia. On the other hand, those who are operated on have a high failure rate, mainly due to suture dehiscence between the seventh and tenth postoperative days. Surgical success depends on the good vascularization of the graft and its resistance to chewing, swallowing, and tongue movements on the palate (SOUSA, 2020).

With proper treatment and careful management, many animals can recover well and lead healthy lives. The partnership between owners and veterinarians is essential to improve the prognosis and well-being of dogs and cats. Although it is not possible to completely

eliminate the risk of cleft palate, preventive measures help to reduce their occurrence and promote the health and quality of life of animals (MOTHÉ, 2024).

3.3.1 Surgical Techniques

In view of the progress in surgical techniques used in neonates of small animals, even with the restrictions imposed by the delicacy of the tissues and the particular metabolic conditions of this stage, the results are remarkable when well-structured strategies are used. The surgical technique adopted to perform the correction of the deformity should be determined according to the patient's conditions, the size of the lesion and the ease of access to the affected region, since the technique can be modified according to each case. However, the management of cleft palate continues to face considerable obstacles, and may differ depending on the clinical condition and surgical techniques available (VIEIRA, 2019).

Several techniques are described in the literature for the repair of palatal defects; however, the greatest chance of achieving complete closure of the cleft palate occurs during the first surgical procedure. Flaps from the oral cavity, pharynx, nasal mucosa, and skin can be used. In addition, custom-made prostheses are also used (VELOSO, 2023).

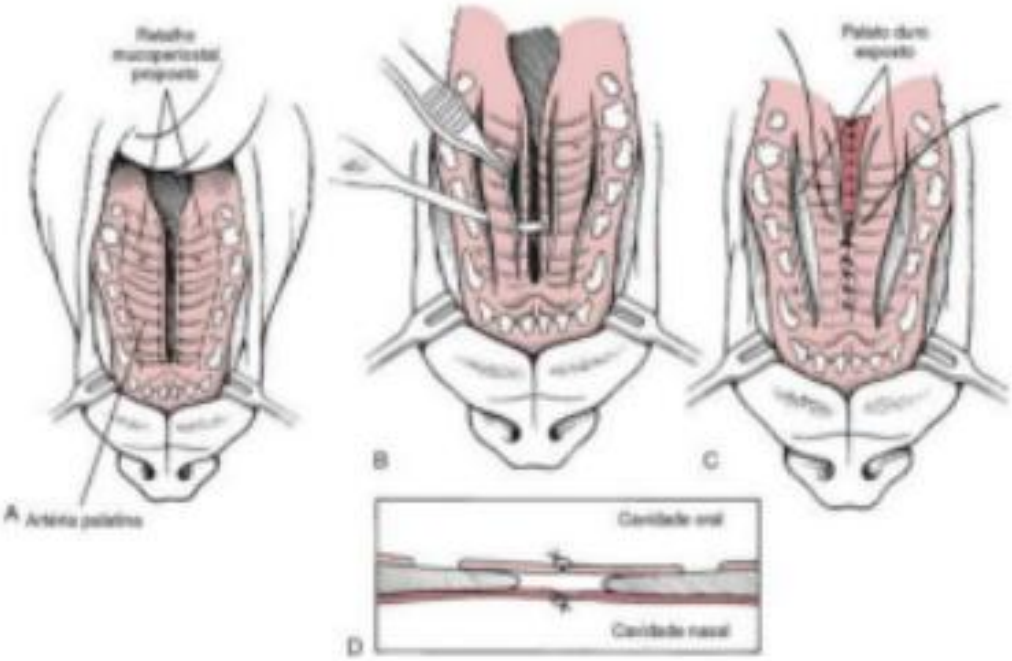
3.3.1.1 Von Langenbeck technique

Von Langenbeck palatoplasty is one of the oldest techniques still in use today, and is considered a good alternative for wide and incomplete clefts due to its simplicity and ease of dissection. When combined with the closure of the nasal lining and the reconstruction of the muscle belt, it is a safe method, with a low rate of occurrence of oronasal fistula (FON) (MENEGAZZO, 2020). It consists of the preparation of anterior and posterior bipedicled mucoperiotal flaps for the closure of the oral mucosa and the detachment and synthesis of the nasal mucosa (RODRIGUES, 2023).

Lateral release incisions usually need to be relatively extensive, and should include the palatine arteries, with the edges reconditioned prior to suturing. Full-thickness incisions may offer greater mobility, but partial-thickness flaps have been shown to reduce scar tissue formation, which could negatively impact maxillary growth in young patients. Therefore, they are more suitable when there is minimal tension, even if the sutures are performed on a defect (MARTINS, 2023).

Figure 4

Illustrative image of the Von Langenbeck technique



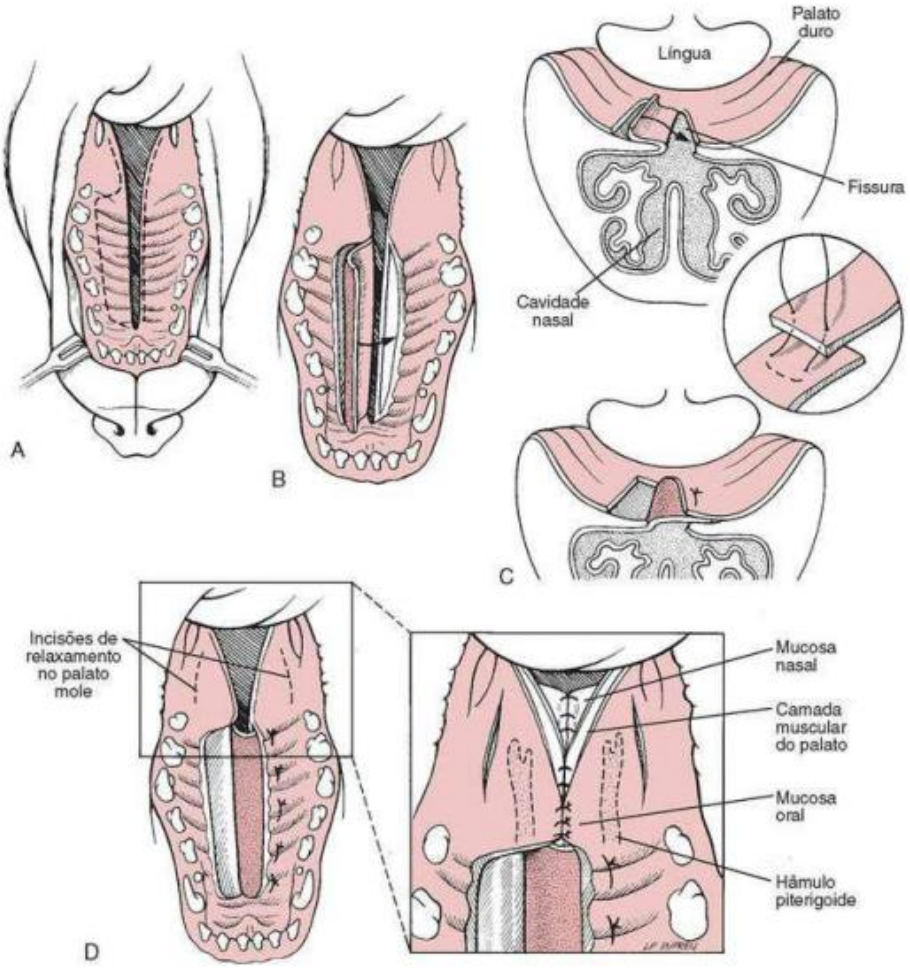
Source: Adapted Freitas (2023).

3.3.1.2 Sandwich Flap Superposition Technique

The technique consists of unilateral incisions in the palatal defect, separating the oral mucosa from the nasal mucosa without positioning the repair directly on the defect. The mucoperiosteum of the margin is raised by about 5 mm and, on the opposite side, creating a rotated mucoperiosteal flap, based on the edge of the defect and large enough to cover it. An incision parallel to the dental arch is made, creating a flap 2–4 mm larger than the defect, with perpendicular cuts at the rostral and caudal ends. This flap is carefully elevated, preserving the edge of the defect and around the palatine artery to free it from fibrous tissue. Finally, the flap is rotated over the defect and its tip is positioned under the opposite flap (FOSSUM, 2018).

Figure 5

Illustrative image of the flap overlapping technique



Source: Adapted Veloso (2023).

3.3.1.3 Techniques for soft palate defects

The technique begins with incisions in the margins of the defect to separate the oral and nasal mucous membranes, extending from the cleft of the hard palate to the soft palate. Then, the nasal mucosa, the palatine muscles, and the oral mucosa are isolated. Closure is performed in three layers, starting caudally and advancing in a rostral direction to the region close to the tonsil. First, the nasal mucosa is sutured with simple interrupted stitches or a continuous pattern, with the knots facing the nasal cavity. Then, the palatine muscle and connective tissue are appositioned with simple continuous suture. Finally, the oral mucosa is sutured with simple continuous or interrupted stitches. To reduce tension, relief incisions are made in the oral mucosa, on the lingual surface of the last molar, near the tip of the soft palate (FOSSUM, 2018).

It is important to highlight that surgical approaches with overlapping flaps, rotational flaps from the hard or soft palate, as well as nasal or nasopharyngeal mucosal flaps, are also indicated for the reconstruction of clefts in the soft palate. The repair of lateral clefts in this

region often involves the use of mucosal flaps from the oropharynx or nasopharynx. In some cases, surgeons choose to perform a controlled fracture of the pterygoid hamulus — the insertion point of the palate muscles — using an osteotome, with the aim of reducing tissue tension during the closure of the soft palate (FREITAS, 2023).

Consequently, one of the main challenges faced in small animal veterinary medicine is neonatal diseases, which can result in significant losses for owners and breeders. These diseases often have a complex resolution for veterinarians, since clinical management is limited by the small size of newborns, the presentation of non-specific symptoms, and the complexity associated with an often multifactorial etiology. One of the measures to reduce the neonatal mortality rate is linked to the proper management and supervision of childbirth, with the aim of preventing possible risks — an approach similar to that used in Human Medicine. In this context, the systematic investigation of fetal anomalies is essential, because, depending on their severity, they may require corrective surgical procedures or, in more severe cases, the indication of euthanasia (NAMMUR, 2020; SILVA, 2020).

Preventive actions, such as raising awareness among those responsible for the animals and controlling the reproduction of severely affected individuals, are essential to reduce the occurrence of this condition and ensure the well-being of the most predisposed breeds (REIS, 2025).

4 FINAL CONSIDERATIONS

Cleft palate is a congenital malformation of great importance due to its prevalence in brachycephalic patients. Immediate evaluation of neonates at birth is essential, as it allows the early implementation of clinical interventions, which contributes to improving prognosis and reducing the mortality rate.

This research can highlight relevant aspects related to the anatomy and etiology of these alterations, in addition to describing information related to diagnosis and treatment. However, we need to highlight that it is essential for the development of preventive strategies. Since it is necessary to understand the knowledge of the clinical signs and the accurate diagnosis, they are essential for the proper management of affected patients.

Making it essential to carry out a clinical examination thoroughly, carefully observing the animal's responses to the environment. It is hoped that the present study will contribute to new research, new therapeutic approaches, and preventive strategies. In order to clarify the necessary care and promote the quality of life of patients with cleft palate, we seek to disseminate knowledge, especially among tutors, in order to improve the management of this condition in the canine population.

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