Cleft Palate and its management

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ABSTRACT

Cleft palate is a congenital malformation that occurs due to the incomplete process of fusion of the palatal bones during fetal development, resulting in an opening in the hard and/or soft palate. This condition has a multifactorial etiology, including genetic, environmental and mixed factors, which interfere with embryological development, with heredity accounting for 25 to 30% of cases, while 70 to 80% are of multifactorial etiology.

Keywords: Cleft palate, Multifactorial etiology, Quality of life.

INTRODUCTION

Cleft palate is a congenital malformation that occurs due to the incomplete process of fusion of the palatal bones during fetal development, resulting in an opening in the hard and/or soft palate. This condition has a multifactorial etiology, including genetic, environmental and mixed factors, which interfere with embryological development, with heredity accounting for 25 to 30% of cases, while 70 to 80% are of multifactorial etiology.

These deformities have a high prevalence in the population and are one of the most common craniofacial anomalies, with an estimated global prevalence of 1 to 1.5 cases per 1,000 live births, and their occurrence rates are particularly notable in specific populations, such as the Brazilian population.

In the socioeconomic and public health context of Brazil, cleft palate represents a significant challenge. The economic implications include the high cost of treatment, which ranges from complex surgeries to multidisciplinary therapies with different types of professionals and long-term follow-up. In addition, affected children often face difficulties related to feeding, speaking, and hearing, which can negatively impact their social and educational development. This scenario puts considerable pressure on the public health system, which must provide continuous and affordable support for patients and their families.

It is important to emphasize that cleft palate is not only a structural and aesthetic change, but it also has a great negative impact on the quality of life of the patient who presents it, and it is essential that its management is carried out by qualified professionals, who offer everything from psychological support to the necessary support to understand and resolve this condition.

On the subject, the main aspects involved in the persistence of cleft palate and its relationship with the process of formation of the digestive tract will be addressed, as well as the influence of genetic and environmental factors, which characterize this pathology as being multifactorial. The importance of early diagnosis, the role of imaging exams for prognosis and effective therapeutic approach will also be discussed, which involve everything from surgery and its team to the possible complications of the procedure. The psychosocial impact on the lives of patients and their families will also be highlighted in the following discussion.

METHODOLOGY

The present study is a narrative review. The search began with the definition of descriptors and the choice and consultation of search platforms. A search was carried out in the PUBMED, LILACS, and SCIELO online databases from January to July 2024. The following descriptors were used: "Cleft palate"; "Pediatrics"; "Management" with the Boolean operator "AND", which were obtained through the Decs/MeSH platform as health descriptors. Data analysis was conducted in a

standardized manner, based on the following inclusion criteria: time frame from January 2014 to February 2024; English and Portuguese language and full text available.

The articles were selected from the analysis of two evaluators, in which the studies were mapped independently, discussing the results and continuously updating the data graph form in order to elaborate an iterative process. The titles were sequentially evaluated, and then abstracts of all publications identified by the searches for potentially relevant articles. Divergences regarding the selection of articles and data extraction by consensus and discussion with a third reviewer, if necessary. In addition, studies were included in manual searches of journals, based on the search for citations, and searches for gray literature.

RESULTS

The search resulted in 494 publications, of which only 18 publications met the objectives proposed in the study from the application of the inclusion and exclusion criteria, as well as from the reading of titles and abstracts.

On the Pubmed platform, using the descriptors present in the title and abstract, 215 articles were found from 1964 to 2024. A time restriction of 10 years (2014 to 2024) was defined, and 85 articles were found. With the inclusion criteria, Portuguese and English were used, 35 studies were excluded, resulting in 50. Only papers available in full text were selected, resulting in 115.

On the Lilacs platform, using the descriptors present in the title and abstract, 115 articles were found from 1964 to 2024. A time restriction of 10 years (2014 to 2024) was defined, and 75 articles were found. With the inclusion criteria used in Portuguese and English, 22 studies were excluded, resulting in 53.

On the Scielo platform, using the descriptors present in the title and abstract, 215 articles were found from 1964 to 2024. A time restriction of 10 years (2014 to 2024) was defined, and 80 articles were found. With the inclusion criteria, Portuguese and English were used, 52 studies were excluded, resulting in 28. Only papers available in full (FULL TEXT) were selected, resulting in 28.

Among the selected articles, the duplication of papers was checked, resulting in 196, with 52 duplications. The next analysis criterion comprised the reading of the titles in the double-blind format with two evaluators, in which the selected materials were only those approved twice, resulting in 36 studies. Subsequently, the abstracts were read by the same evaluators, resulting in 15 studies.

DISCUSSION

During the fourth week of gestation, the digestive tract develops into three segments: cephalic, middle, and caudal. Alterations in this process, such as cleft palate, can persist throughout the individual's life. In this case, the formation of the oral cavity is affected laterally, with the gill

arches giving rise to the head and neck. The first gill arch corresponds to the lower third of the face. Simultaneously, the central nervous system and the frontonasal process develop, giving rise to the nasal fossae and processes. The junction of the primitive jaw with the nasal processes forms the primary palate, cheek, and lateral upper lip. These changes last an average of 10 weeks, and the formation of the crack occurs due to the failure of the junction of these structures (MOORE et al., 2008).

The etiology of cleft palate is not yet fully understood, but it is noticeable that genetic and environmental factors are involved. Among the most significant are smoking and alcohol (PINHEIRO, 2017). Other risk factors include advanced maternal age, male gender, and low birth weight (RIBEIRO, E.; MOREIRA, 2004).

The cleft lip can present several conformities, being complete, incomplete, unilateral or bilateral, symmetrical or asymmetrical. Early diagnosis can help in the prognosis and preparation of the multidisciplinary team and the family. Imaging tests, especially morphological ultrasound performed in the first trimester of pregnancy, are essential for the visualization of malformations. In the case of clefts, the incidence of the retronasal triangle is an important milestone for the evaluation of the palate (BUNDUKI et al., 2001).

Cheiloplasty is the surgery of choice for the correction of cleft palate. To be successful, it is necessary to minimally resect the tissues, preserve the anatomy and reconstruct in the three planes: mucous, muscular and cutaneous (CAPELOZZA et al., 2002). Surgical management aims to improve language, speech, hearing, airway patency, psychosocial and aesthetic development (CAMPBELL, 2010; et al., 2002). Ultrasonography, due to its ability to observe muscles in movement and at rest, facilitates pre- and postoperative planning (POWER et al., 2010).

The surgical procedure is not classified as urgent, allowing many risks to be minimized. Surgery is avoided in children weighing less than 4500 grams or with alterations in hemoglobin, white series and coagulogram. However, even with ideal conditions, complications such as hypoxemia, respiratory obstruction, hypovolemia, and edema may occur, most of which are related to anesthesia (BIAZON; OF CÁSSIA; PENICHE, 2008).

To perform the surgery according to the aforementioned predilections, the ideal team should be multidisciplinary, including a plastic surgeon, oral and maxillofacial surgeon, speech therapists, dentists, pediatricians, social workers and otorhinolaryngologists (FURR MC, et al., 2010). The protocol includes closing the lip and palate initially, followed by bone grafting, orthognathic surgery, and secondary rhinoplasty to correct residual deformities. Rehabilitation and social insertion depend on the patient's adherence and the experience of the multidisciplinary team (SHAW WC, et al., 2001).

The presence of cleft can affect everything from functional to aesthetic aspects, with a significant impact on quality of life. Hypernasal voice, chewing, breathing, and aesthetic problems can lead to bullying and social stigmas, directly influencing the response to treatment and patient compliance. Psychological support is crucial for patients and their companions, and is essential for effective follow-up, considering that patients with cleft palate have a higher risk of hospitalization for psychiatric disorders and, consequently, a high mortality rate (Guimarães et al., 2014).

CONCLUSION

It is concluded that the presence of cleft palate represents an enormous challenge for both the patient and their companions. Insecurity and physical and social challenges emphasize the importance of the surgical procedure. The success of this procedure depends directly on the therapeutic planning offered, often facilitated by early diagnosis through ultrasonography, which allows multidimensional observation of the extent and involvement of the cleft. Although ultrasound images may not accurately reflect in all planes, the identification of the cleft is crucial not only for surgery, but also for the preparation of the family nucleus and the multidisciplinary team.

The performance of a multidisciplinary team is essential for the integral development of the individual, since several professionals promote comprehensive patient care, preventing, in most cases, the increase in mortality associated with this pathology. The risks for psychiatric disorders, difficulties in breathing, swallowing and phonation are present and significantly impact the quality of life of patients with this anomaly.

Thus, the importance of studies that cover the various aspects of the life of individuals with cleft palate is demonstrated, from early diagnosis to their development as a human being inserted and active in society.

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