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A Review on Cleft Lip and Palate

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ABSRACT:

Among facial deformities, cleft lip and palate are the most prevalent. Each year, thousands of children worldwide are affected by craniofacial birth abnormalities such as cleft lip and palate. Lip only, lip and palate, or palate only could be affected. One of two main causes of cleft lip in children is either genetic (such as chromosomes and family history) or environmental (such as smoking, alcohol, and poor nutrition). Depending on the location of the defect and the age of the infants, a variety of professionals who specialize in treating clefts choose the optimal course of action. The World Health Organization (WHO) added cleft lip and palate to their Global Burden of Disease (GBD) effort in 2008 after realizing that non-communicable diseases, such as birth abnormalities, significantly increase newborn mortality and childhood morbidity. This will help the global birth defects registration initiatives that are meant to enhance care quality and eventually avoid nonsyndromic lip and palate clefts.

Key Words: Cleft lip , Cleft palate, Etiology, ,Treatment.

INTRODUCTION:

A congenital anomalous gap or space in the palate, alveolus, or upper lip is called a cleft.

Cleft lip:what is it?

- The center of the face is where the tissue from both sides of the head connects to form the lips and mouth; this process occurs between weeks 4 and 7 of fetal development.The birth condition known as cleft lip is caused by the upper jaw and nose tissues not joining as they should during fetal development, splitting the lip.

Cleft palate:what is it?

- Between six and nine weeks of pregnancy, the palate forms.
- A cleft palate develops during fetal development and is a split or opening in the roof of the mouth.
- The hard palate, or the bony front part of the roof of the mouth, and the soft palate, or the soft rear portion of the roof of the mouth, can both be affected by cleft palate.

A person may have cleft lip and palate on one or both sides of their mouth. because the palate and lips mature at different times.

- One can have a cleft lip without also having a cleft palate.
- Cleft lip but not palate.
- Cleft palate and lip together (most frequent).

Clefts appear in the fourth stage of development. The precise areas at which fusion of different facial processes failed to occur determine their exact appearance, which is impacted by the stage of embryologic life at which some interference with development occurred.

EMBRYOLOGY:

At four to eight weeks of gestation, the face develops from five prominences. The two are paired maxillary prominence and frontonasal prominence.

Mandibular prominence paired, centered on the stomodeum

The medial nasal prominence and the maxillary prominences on both sides expand toward one another and merge to form the midface.

Palate clefts develop later, between 7 and 12 weeks of gestation, as a result of the fusion of the palatal shelves failing to merge.

Cleft lip results from the inability of the medial nasal processes to fuse with the maxillary processes.

The cleft may be unilateral or bilateral, total or partial, affecting the lip, hard palate, or soft palate.

In cleft lip situations, the lip does not fuse completely during fetal development. Cleft lip and palate are congenital abnormalities that happen during pregnancy, just like neural tube defects. The same gene mutation is the cause of both. The degree of the deformity might vary from mild to severe. A condition known as CPO occurs when the palate extends into the nasal cavity as a result of the roof of the mouth's inadequate fusion during fetal development. Since embryonic development occurs sequentially, cleft lip and CPO may occur independently.

EPIDERMIOLOGY:

Its incidence is typically 1 in 700 births, and the UK sees about 1000 new instances of it each year.

In the United States, cleft lip and palate are prevalent congenital conditions.

- Roughly 1 in 1600 infants are born with a cleft palate and lip.
- One baby out of every 2,800 is born with a cleft lip but not a cleft palate.
- Approximately 1 in 1700 infants are born with a cleft palate.

The following is the typical distribution of cleft types:

- Cleft lip alone 15%
- Cleft lip and palate – 45
- Cleft palate that is isolated: 40%

The left side experiences it more frequently than the right.

Male babies are more likely to be born with cleft lip and palate.

Babies classified as female at birth are more likely to have cleft palates (without cleft lips).

Clefts that are unilateral account for 80% of cases, with bilateral cases making up the remaining 20%.

Seventy percent of unilateral cleft cases involve the left side.

TYPES OF CLEFT LIP:

1. Partial Unilateral Cleft Lip: This condition affects only one side of the upper lip and does not spread to the nose.

2.Complete Unilateral Cleft Lip: One side of the top lip, extending into the nose, has a cleft.

3.Incomplete Bilateral Cleft Lip: A cleft is present on both upper lip sides, but it does not reach the nose.

4. Complete Bilateral Cleft Lip: A cleft that extends to the nose and is present on both sides of the top lip.

5.Bilateral Complete & Incomplete: There is a cleft on both sides, however it only reaches one nostril on each side.

6. Isolated Cleft Lip: In this instance, there is no cleft palate—only a cleft lip.

TYPES OF CLEFT PALATE:

1. Submucous Cleft Palate: Although the palate appears normal from the outside, there is a muscular gap in the rear of the mouth.

2. Complete Unilateral Cleft Palate: This condition affects only one side of the palate and does not extend to the nose.

3. Complete Unilateral Cleft Palate: The cleft extends to the nose on one side of the palate.

4.Incomplete Bilateral Cleft Palate: This condition causes the palate on both sides of the mouth to be cleft, but it does not continue to the nose.

5.Complete Bilateral Cleft Palate: The cleft reaches the nostril and is present on both sides of the oral palate.

7. Alveolar Cleft Palate: This kind of cleft palate may or may not extend into the palate, but it is only noticeable at the top gum line of the mouth.

8.Isolated Cleft Palate: A palate defect.

ETIOLOGY:

A baby's cleft lip and cleft palate result from an improper fusion of the tissues in their mouth and face. In the second and third months of pregnancy, the tissues that comprise the lip and palate fuse together morphologically. Yet the fusion never occurs in infants who have both a cleft lip and a cleft palate.

Genetic and environmental factors interact to cause the majority of occurrences of cleft lip and palate.

A)Genetic Factors:

One factor thought to contribute to the development of cleft lip and palate is family history. For instance, 9% of children are born with a cleft lip and palate from one parent. There is a 4% chance that unaffected parents will pass on a cleft lip and palate to their subsequent child. Cleft lip and palate can develop alone or in conjunction with a number of diseases, including

- Pierre Robin Syndrome.
- Treater Collins Syndrome;
- Stickles Syndrome
- Hemispheric microsomia
- Dysplasia of the ectoderm

Thus, it is referred to as cleft palate syndrome in these circumstances. However, clefts can also occur in people who do not have a condition (non-syndromic cleft palate). Furthermore, there exist additional genetic variables associated with trisomy 13; trisomy 18; and trisomy 21 that lead to cleft lip and palate.

B) Environmental Factors:

Smoking and Alcohol: Pregnant women who smoke and consume alcohol may be at an increased risk of developing cleft lip and palate.

Diabetes: Women who receive a diabetes diagnosis prior to becoming pregnant may be more likely to give birth to a child who has cleft lip or palate.

Medication: Certain drugs may cause clefting of the lip and palate.

For instance, corticosteroid steroids, which are used during some pregnancies as a result of anxiety and insomnia. Additionally, because they expose pregnant women to retinoid medications, these treatments are thought to be one of the primary causes of cleft palates in babies.

Infection: During pregnancy, several illnesses, like rubella (also known as German measles), can occur.

Obesity during pregnancy: There's been research linking obesity to a higher risk of cleft lip and palate in offspring.

SYMPTOMS:

Because of the incomplete development of their roof of the mouth, babies with cleft palates may have more difficulty feeding themselves from a bottle or breast. When they attempt to eat, food or fluids may flow out of their nose.

Additional signs and symptoms include:

- Difficulty or delayed speaking
- Small, crooked, or missing teeth;
- Unevenly spaced teeth and jaws;
- Ear infections;
- Hearing loss;

COMMON PROBLEMS ASSOCIATED WITH CLEFT LIP AND CLEFT PALATE:

Feeding Difficulties: Anomalies related to the cleft palate are more likely to cause feeding difficulties. Because the roof of the mouth is still developing, the baby might not be able to suckle correctly.

Ear Infection & Hearing Loss: People who have cleft lip and palate are susceptible to ear infections because of issues with a muscle that opens the ear tube. Hearing loss may result from recurrent infections like these. When there is a secondary condition known as submucous cleft palate, the risk increases.

Speech Problems: Muscle problems in the roof of the mouth can make it difficult for people with cleft lip and palate to talk. They frequently take longer to produce some sounds, such as "p," "b," "t," "d," "k," and "g." People who have a cleft lip and palate frequently experience abnormal nasal noises and difficulty speaking clearly.

Dental Issue: Tooth development may be impacted if the cleft penetrates the upper gum line.

Cosmetic Issues: Individuals with cleft lips experience cosmetic issues in addition to difficulties producing labial noises. When attempting to make contact between their upper and lower lips, babies with cleft lips have difficulties.

Emotional Issues: Children with cleft lip and cleft palate experience feelings of self-consciousness and humiliation regarding their looks.

DIAGNOSIS:

•**Prenatal Ultrasound:**

An ultrasound is a diagnostic procedure that creates images of your unborn child by using sound waves. Ultrasounds are often performed by doctors twice during pregnancy: once in the first trimester and once between weeks 18 and 20. During an ultrasound between 11 and 13 weeks, the doctor should be able to identify differences in the structure of your baby's face. The cleft lip and palate become more noticeable as the fetus grows. Cleft lip and palate or cleft lip alone are frequently visible on an ultrasound around 16 weeks during pregnancy. This imaging examination may not reveal a partial cleft lip or a cleft palate alone.

•**Physical examination at birth**: A cleft lip is frequently seen as soon as the baby is born. The baby's mouth and face will be examined by a physician or midwife to look for any anomalies.

•**Nasal endoscopy:** This procedure involves looking at the back of the throat and the nasal passages using a thin, flexible tube called an endoscope that has a light and camera attached to it. This can assist in determining the degree and diagnosis of a cleft palate.

•**Imaging studies**: When a cleft is complex or involves other structures, imaging studies such as X-rays, CT scans, or MRIs may be utilized to obtain a detailed look of the cleft and its extent.

•**Genetic Testing**: Genetic testing might be advised in certain situations, particularly if there is a family history of cleft lip and palate or other hereditary disorders.

TREATMENT:

One of the goals of treating a child with cleft lip and cleft palate is

1.To enable them to speak normally.

2.Give a regular diet.

3.Provide a healthy dentition.

4.A typical hearing level.

This repair entails creating a non-obtrusive face through surgery, a vocal apparatus that allows for understandable speaking, and a dentition that allows for both ideal function and beauty. This necessity led to the development of the cleft palate team concept. Because a variety of clinical competence kinds work best to achieve optimal care.

CLEFT LIP AND PALATE TEAM :

A multidisciplinary team of specialists is involved in the treatment:

- In order to treat cleft lip and palate, a plastic surgeon assesses the patient and performs the appropriate surgery. Orthodontic treatments are needed to straighten the teeth.
- Regular examinations with a dentist are necessary for maintaining good oral hygiene.
- The speech therapist will evaluate the speech issue and suggest a course of action.
- The ENT expert will evaluate treatment options after diagnosing hearing issues.
- A clinical psychologist is crucial to the care of CLP patients. They help patients in society by enhancing their psychological well-being. Children who have cleft lip and palate are unable to interact socially and academically with their peers.

SURGICAL TREATMENT:

Surgery for Cleft Lip and Palate correction depends on the unique circumstances of the child.

•After the initial cleft repair and any additional surgeries to enhance speech or the appearance of the nose and lip.

CLEFT LIP REPAIR:

Typically, lip repair surgery is performed when your child is three months old.

Your baby's cleft lip will be stitched shut and mended after receiving a general anesthetic, which renders them unconscious.

After surgery for cleft lip:

- To minimize rubbing at the surgical site, your kid might need to wear padded elbow restraints.
- Your child might be agitated and experience mild pain.It's usual to have blood, bruises, and swelling at the stitch sites. In five to seven days, stitches disintegrate or come out.
- Scars will lighten over time but not totally vanish.
- Your child will get fluids via an intravenous (IV) catheter until he is able to drink enough.

REPAIR OF CLEFT PALATE:

Typically, palate repair surgery is performed between the ages of six and twelve months.

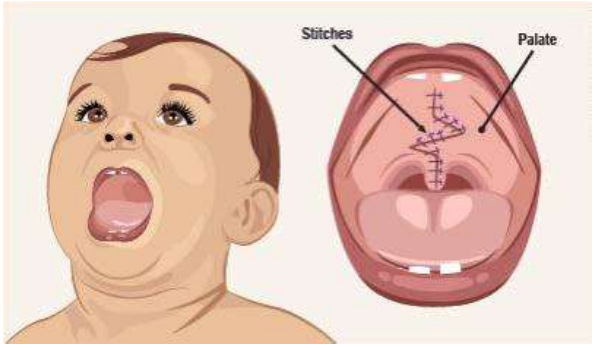
The muscles and palate lining are adjusted, and the opening in the roof of the mouth is sealed.

The incision is sealed with biodegradable sutures.

Usually requiring two hours, the procedure is carried performed under general anesthesia.

Most kids spend one to three days in the hospital.

The palate repair scar will be located inside in the mouth.



After surgery for cleft palate:

- Your child may have nasal congestion;
- Cleft palate repair may cause greater pain and discomfort than cleft lip repair. Medication can help with this.
- To prevent infection, your kid may require a one- to three-day hospital stay during which they will receive antibiotics.
- Your child's palate will be stitched up. The stitches will fall out in a few days. If packaging is placed on the palate, wait for instructions before removing the packing.
- Bloody discharge from the lips and nose is possible. Temporary bruising, bleeding, and edema at the surgical site are also common.
- Your child will get fluids via an intravenous (IV) catheter until he is able to drink enough.

Repair of the anterior palate:

To fix the defect, a vomerine flap obtained from the nasal septum is used in anterior palate repair.

Rhinoplasty (nose repair): six to nine years

A moderate rhinoplasty might be done if the patient has a severe nasal deformity. In order to improve the form and airway of the nose, this treatment involves opening the nose and realigning the cartilage.

Your plastic surgeon might execute a tip rhinoplasty if there is a less severe nose abnormality. By focusing only on the tip of the nose, this treatment improves the nasal airway and creates more symmetry.

Additional Surgery :

In certain instances, a follow-up procedure may be required to:

1. use a bone graft to close a gum cleft; this procedure is often carried out when the patient is between the ages of 8 and 12.

2. Enhance the lips and palate's appearance and functionality; this may be required if the initial surgery did not heal properly or if speech issues persist.

3. enhance the nose's form (rhinoplasty).

4.Enhance the jaw's look — babies born with cleft lip or palate can have a tiny or "set-back" lower jaw.

PHARMACEUTICAL MANAGEMENT:

The main goals of pharmaceutical management for patients with cleft lip and palate are to provide supportive care, manage pain, avoid infections, and treat any related illnesses. The following are a few typical medication therapies for the treatment of cleft lip and palate:

Pain control is crucial following surgical correction of cleft lip and palate. This could involve using over-the-counter painkillers like ibuprofen (Advil, Motrin) or acetaminophen (Tylenol). Prescription painkillers might be required in some circumstances, particularly for more involved surgery.

Antibiotics: Infections can be prevented or treated using antibiotics, especially following surgical repair. Infections can impede healing and raise the possibility of complications, which makes this crucial. Antibiotics including clindamycin, cephalexin, and amoxicillin are frequently utilized.

Topical Antimicrobial Agents: Topical antimicrobial agents are sometimes used to stop surgical site infections. Mouth rinses and antibacterial ointments may fall within this category.

Nasal Decongestants: Because of the physical defects associated with cleft palate, nasal congestion can be common in newborns and children. To help reduce congestion and facilitate breathing, saline nasal sprays or nasal decongestants may be used.

Nutritional Supplements: Babies born with cleft lip and palate may experience feeding difficulties, which may have an impact on their nutritional status. It could be advised to take nutritional supplements, including specific formulae or fortified breast milk, to guarantee enough nourishment and support healthy growth and development.

Dental Care Products: To address dental difficulties related to cleft lip and palate, such as gaps in the gum line or misaligned teeth, specialized dental care products, such as orthodontic equipment or dental adhesives, may be recommended.

Medication for speech therapy: Speech therapy is a crucial component of resolving speech issues related to cleft palate, even though it is not a medicinal intervention. To help children with cleft lip and palate develop their speech and language skills, speech therapists can employ a variety of methods and activities.

CONCLUSION:

Both cleft lip and palate are birth deformities that impact several aspects of structure and function, including eating, speaking, nutrition, and so forth. In order to ensure that treatment for cleft lip and palate occurs at the appropriate age, the main goal is to educate the parents. In addition, this promotes both

aesthetically pleasing and functional wellbeing. While surgical therapy is important, it is also important to take the patient's mental health into account so that appropriate psychological rehabilitation can be taken into account. In order to attain acceptable oral health, CLP patients typically need extensive dental therapy. The findings of this challenge improved steadily as a result of the multidisciplinary strategy taken to solving it.

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