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Fetal Deformities: Cleft Lip and Cleft Lip (Cleft Lip) in Newborns in the City of Basra

Anwar N. Seiwan
Department of Biology, College of Science, Basrah University

Abstract: Cleft lip, also known as a harelip, is a congenital deformity affecting children. It results from improper fusion of tissues during fetal development, leading to a split or openings in the upper lip, the roof of the mouth, or both. There are various types and forms of cleft lip; it may occur on one side of the upper lip or on both sides, and it can be either complete or incomplete.

Several factors contribute to the development of a cleft lip. Genetic or hereditary causes increase the likelihood if there is a family history of the condition. Additionally, certain medications taken by the mother during pregnancy can negatively affect fetal development, leading to cleft lip. These include antiepileptic drugs such as valproate, acne medications like Accutane, and certain heart medications. Substance abuse, including drug use, alcohol consumption, and smoking by the mother, also increases the risk. Exposure to radiation, chemicals, certain viruses, and maternal diabetes are among other contributing factors.

Cleft lip can lead to several complications, such as difficulties with feeding, speech, and hearing. It may also result in ear infections due to fluid leakage during feeding, dental abnormalities, and improper tooth development. The condition can also impact the child's behavior and social adaptation due to psychological effects.

Treatment typically involves surgical repair of the cleft, performed by specialized surgeons who reconstruct the lip using surrounding tissues.

Key words: Cleft lip, congenital deformities, pregnant women, and psychological condition.

Introduction:

Cleft lip and cleft palate are characterized by openings or splits in the upper lip, the roof of the mouth (palate), or both. These conditions occur when the facial tissues of an embryo do not fully fuse. Cleft lip and cleft palate are among the most common congenital deformities, often appearing as separate anomalies but also associated with various genetic syndromes or conditions.[1]

The term "cleft lip" is used because the lip of the affected individual appears split, and it is sometimes colloquially referred to as "harelip" or "schrim" due to the appearance of the lip and nose.[2]

Clefts of the lip and palate are among the most prevalent genetic facial and oral deformities, occurring during early pregnancy due to a deficiency in tissue in the lip or palate area. Normally, the tissues forming inside the mouth should connect properly during this period. The lips and the roof of the mouth start to form between approximately seven to nine weeks of gestation. The lips develop first, followed by the growth of the hard and soft palates, which can develop independently of each other. Therefore, clefts can occur in the lip alone, the palate alone, or both.

The incidence of cleft lip, whether associated with cleft palate or not, is approximately 1 in 700 live births, making it the fourth most common congenital defect. It is more prevalent in males than in females.[7]

Types of Cleft Lip and Cleft Palate

There are various types of cleft lip and cleft palate, which can also involve the nose and the palate. The main categories are:

1. **Unilateral Cleft:** Affects only one side of the face.
2. **Bilateral Cleft:** Affects both sides of the face.

Within these categories, there are three subtypes:

1. **Incomplete:** The cleft extends partially through the lip, with partial fusion of the lip segments.
2. **Complete:** The cleft extends fully through the lip, with no connection between the lip segments.
3. **Bilateral Cleft:** Both sides of the lip may be affected differently; one side may be complete while the other is incomplete.

Causes of Cleft Lip and Cleft Palate

1. Genetic and Environmental Factors: Most researchers believe that cleft lip and cleft palate result from a combination of genetic predispositions and environmental factors. The risk is higher if siblings, parents, or relatives have the condition.[5]
2. Genetic Inheritance: There is a hereditary component to cleft lip and cleft palate, often described as multifactorial inheritance. If a family member is affected, the likelihood of recurrence within the family increases. The risk of recurrence in families with a history of the condition can reach 3-5%, compared to a general prevalence of 1.2 per 1,000 births. If one parent is affected, the risk for their children increases to about 10%. However, studies have not shown that these conditions are inherited in a recessive manner.[2'10]

Degree of kinship	Cleft lip and cleft palate	Cleft palate
Siblings - General Risk Percentage	%4	%18
Siblings - No Cases of Affected Individuals	%2.2	-
Siblings - Two Affected Siblings	%10	%8
Siblings Affected and Parents Affected	%10	-
Second-Degree Kinship	%0.6	-
Third-Degree Kinship	%0.3	-
General Percentage	%0.1	%0.04

3. Maternal Exposure to Harmful Substances: Exposure to radiation or harmful chemicals during pregnancy has been linked to an increased risk of cleft lip and palate.[7]
4. Medications During Pregnancy: Certain medications taken by the mother are associated with an increased risk of congenital anomalies, including cleft palate. These include:

- Antiepileptic drugs and anticonvulsants such as valproate.
- Acne medications such as Accutane.
- Drugs for autoimmune diseases, psoriasis, arthritis, and cancer, such as methotrexate.[5]
- Some heart medications.[7]

5. Folic Acid Deficiency: Insufficient folic acid during pregnancy is associated with a higher risk of cleft lip and palate.[2]

6. Maternal Health Conditions: The presence of certain maternal health conditions, such as diabetes, can increase the risk.[6]
7. Substance Use: Smoking and alcohol consumption by the mother during pregnancy are linked to a higher incidence of cleft lip and palate.[1]
8. Viral Infections: Exposure to certain viruses during pregnancy may contribute to the development of cleft lip and palate.[7]
9. Nutritional Deficiencies: Inadequate intake of essential nutrients and vitamins, such as Vitamin E, calcium, and other dietary elements, during pregnancy can increase the risk.[6]
10. Consanguinity: The occurrence of cleft lip and palate may be more common among children of consanguineous marriages.[7]
11. Corticosteroid Use: The use of corticosteroids during the early months of pregnancy has been associated with an increased risk of cleft lip and palate.[2]

Problems and Complications Associated with Cleft Lip

1. Ear infections, hearing loss, and speech defects [2].
2. A noticeable impact on the child's behavior and social adjustment due to psychological conditions [7].
3. Difficulties with breastfeeding; a child with a cleft lip may struggle with both breastfeeding and bottle-feeding due to an inability to properly seal the mouth [5]. Soft, flexible nipples are recommended, as they allow the mother to squeeze the nipple while the child is sucking, thus assisting the child with less effort.
4. Hearing impairment resulting from chronic middle ear infections due to the accumulation of liquid food in the middle ear. In such cases, specific ventilation tubes are inserted into the child's middle ear to help drain the liquid [7].
5. The ventilation tube procedure involves a surgeon, under anesthesia, placing a small plastic tube known as a Ventilation Tube or Grommet into the upper part of the eardrum. This tube allows air to flow from the outer ear to the middle ear, preventing fluid accumulation and facilitating hearing [2].
6. Speech problems: Children with cleft lip and cleft palate often face speech issues where their voice does not sound clear. These issues can manifest as nasal speech, leading to a condition known as velopharyngeal insufficiency [6]. Speech may become difficult to understand. Not all children experience these issues; in some cases, surgery can resolve the problem completely. For others, a speech therapist or a specialist in speech-language pathology works to address speech problems [8].
7. Oral and dental issues: If the cleft extends to the gums and upper jaw, teeth may emerge in incorrect positions or extra or malformed teeth may develop [7]. Children with clefts are more prone to increased cavities in the mouth and may experience additional or missing teeth, malformations, or displacement of some teeth. Consequently, they often require a dentist and an orthodontist for treatment [8].
8. The lips serve as the primary outlet for the mouth and the end of the speech apparatus, playing a crucial role in speech production and forming various sounds (such as "b," "m," and "f"). Cleft lip affects the production of these sounds and can also lead to excessive drooling [6].

Diagnosis of Cleft Lip and Cleft Palate

Ultrasound can detect a cleft lip as early as the 12th week of pregnancy. If your doctor suspects that your baby has a cleft lip, additional tests such as detailed ultrasounds or magnetic resonance imaging (MRI) may be performed [3]. If ultrasound is unable to diagnose the condition before birth, a

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physical examination of the mouth, nose, and throat can confirm the diagnosis after the baby is born. In some cases, diagnostic tests may be conducted to identify any other abnormalities [8].

Treatment of Cleft Lip

1. During the first three months of the infant's life, the focus is on feeding, growth, and preparation for surgical intervention. The optimal time for surgery is usually between three to six months of age. The child is typically evaluated, and a surgical plan is developed by a plastic surgeon [4].
2. Feeding should be stopped several hours before the surgery to prevent aspiration of stomach contents into the lungs. An intravenous solution is generally administered to provide the baby with fluids before and after the operation [4].

If your baby has a complete bilateral or unilateral cleft lip with a cleft palate, the initial step often involves orthodontic and maxillofacial treatment [3].

Surgical Procedure

The cleft lip repair involves using the tissues around the cleft to close the gap, and the surgery typically lasts at least two hours in the operating room. After the procedure, the baby is moved to a recovery room for a period of time [4]. This surgery is usually performed at around three months of age, although it can be done earlier. The procedure involves joining the muscle ends of the lip and modifying the nasal opening, which affects the development of the dental arch, leading to proper growth in cases of unilateral cleft lip. For bilateral cleft lip, it also involves modifying the upper jaw [2].

Secondary Procedures

A revision of the lip or nose is an option but is not always required. Some children with cleft lips that include the gum line (cavity) may need additional surgery between the ages of 8 and 10. This surgery, which involves adding bone grafts to the gum line (known as alveolar bone grafting), helps the permanent teeth to come in and allows the child to wear braces [3].

Surgical Team

Addressing cleft lip and palate, as well as other facial and jaw congenital anomalies, requires a specialized medical team covering the comprehensive needs of the condition. This team is involved from birth and continues through the treatment phases. Other specialties may be needed, and the team typically includes:

1. Plastic Surgeon: Performs the necessary surgeries to close the cleft lip and palate and any associated cosmetic procedures [2].
2. Orthodontist: Works on correcting the alignment and positioning of the teeth [8].
3. Speech-Language Pathologist: Assesses the child's language and speech abilities and addresses speech defects associated with the condition [2].
4. Prosthodontist: Creates dental prosthetics to improve appearance and function, such as eating and speaking [8].
5. Geneticist: Studies and diagnoses the condition, providing advice on the likelihood of recurrence within the family [2].
6. Nutritionist: Evaluates swallowing abilities and provides guidance on appropriate feeding methods [2].
7. Psychologist: Offers psychological support to the family and the child [8].
8. Dentist: Provides routine dental care [8].
9. Audiologist: Evaluates and assesses hearing problems [8].
10. Nursing Staff: Provides continuous monitoring of the child's health [8].

Postoperative Care Instructions

Pain Management: After the surgery, the child may be irritable and cry frequently due to pain. Pain medications should be administered to alleviate discomfort and help the child rest. The nurse may use arm restraints to prevent the child from bending their arms and touching or scratching the lip. It is advisable to keep the child's head slightly elevated to minimize facial swelling post-operation [4].

Care for the Lip After Surgery:

1. Avoid touching or manipulating the wound and sutures [4].
2. Apply a moisturizing cream (such as Fusidic acid) only to the red areas of the lip [9].
3. Do not remove the adhesive tape from the surgical site [4].
4. Bathing the child is permissible, but care should be taken to prevent excessive water from reaching the wound and ensure thorough drying [9].
5. Clean the sutures gently using sterile water and remove any dried fluids or blood with care [4].
6. Nasal Stent: Also known as a nasal splint, this is a pair of small, smooth tubes placed in the child's nostrils after cleft lip surgery to help maintain the shape of the nasal openings.

Possible Complications:

1. Wound bleeding [4].
2. Wound infection or unpleasant odor [4].

Appearance of the Child After Cleft Lip Repair:

The child's lip, nose, and face will likely be swollen for a few days post-surgery. The area around the wound may appear red for several weeks. The scar may take up to a year to fade and become less noticeable, though it will not completely disappear [3].

Prevention:

To reduce the likelihood of a cleft lip or palate, consider the following steps:

1. Genetic Counseling: If cleft lip and palate are common in your family, discuss this with your doctor before becoming pregnant. Your doctor may refer you to a genetic counselor to assess the risk of your children inheriting the condition [1].
2. Prenatal Vitamins: If you are planning to become pregnant, consult your doctor about taking prenatal vitamins [1].
3. Avoid Alcohol and Smoking: Consuming alcohol and smoking during pregnancy increases the risk of congenital anomalies, including cleft lip and palate [1].

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