# Management of Cleft Lip and Palate in Pediatric Dentistry: A Review

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## Abstract

Birth of a child is considered the happiest moment of a parent's life and magical experience where God entitles a mothering power of creation. When a child born with a cleft, it represents a disaster for parents. Surgical restoration of soft tissue continuity of the lip and palate consequences in an approximation of the maxillary segments irrespective of surgical technique. The degree of maxillary width reduction depends on several factors, including surgical technique, the surgeon's skill, scar formation, degree of tissue deficiency, and timing procedures.

***Keywords:*** *Cleft Lip and Palate; Management; Pediatric Dentistry.*

## Introduction

Cleft palate is also known as harelip. Orofacial clefts are among the foremost common congenital anomalies. Such anomalies can have several consequences like impaired suckling, defective speech,difficulty in hearing, upper protrusion,gross facial impairment, severe mental disorder. Cleft of the lip and palate is one such condition that happens at such a strategic place within the orofacial region and at such an important time that it becomes a posh congenital deformity. Clefts are complicated conditions,which affect the look, and the activity of the child will concern many other consultants.[1-3]

**Incidence:** The frequency and geological distribution of clefts vary largely around the world due to discrepancies in birth prevalence as well as failure in the recording of childbirth and congenital malformation. In males,cleft lip is more, not unusual and in the case of women, cleft palate is more commonplace. There are two varieties of clefts that are unilateral clefts and bilateral clefts. About 80% of prevalence seen in one-sided clefts and about 20% of incidence seen in both sided clefts. In the case of one-sided clefts, the left side is mostly affected which is around 70%.Least prevalence noticed among Negroids(0.4/1000) and the highest incidence visible in mongoloid and afghans(4.9/1000).[4-6]

**Embryological Background:** By fusion of several embryonic processes, the face is formed around the primordial oral cavity. Five branchial arches developed at the position of the future neck around the fourth week of intrauterine life. The first arch, called the mandibular arch performs an important role in the improvement of the naso-maxillary complex. The developing forebrain which is covered by mesoderm proliferates and protrude the stomodeum.

On either side of the mandibular arch,the dorsal end gives rise to bud called the maxillary process.[7]

The frontonasal process gets divided into a medial nasal process and two lateral nasal processes with the formation of the nasal pits. By the fusion of the maxillary process,the upper lip and primary palate are formed with the one medial and two lateral nasal processes. By the 6th week of gestation,the upper lip and the primary palate frequently start merging.[8]

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**Development of Palate:** The palate is formed utilizinga maxillary manner, frontonasal method, and palatal cabinets have given off using the maxillary procedure. The frontonasal manner gives rise to premaxillary vicinity and palatal cabinets from the rest of the palate. In the 8th week, the fusion of palatal cabinets begins and continues until the 12-seventeenth week. Palatal cabinets covered through an epithelial lining. If palatal shelves be a part of, epithelial cells degenerate. Connective tissue present in palatal shelves be a part of every other and resulting in their fusion.[8]

**Development of Lip:** The lower lip is formed by the fusion of mandibular sides and the upper lip is formed by the medial nasal and maxillary processes. By the fifth week's gestation, the medial nasal and the maxillary process should be failed by merging one or both sides in the cleft lip.[9]

**Table 1. Etiology, predisposing factors & clinical features and syndromes[10-12]**

| | |
|---|---|
| Etiology | 1. Infection;<br>2. Heredity;<br>3. Environment;<br>4. Lack of inherent development;<br>5. Effect of alcohol and certain drugs during the formation |
| Predisposing factors | 1. Toxemia;<br>2. Diabetes;<br>3. High maternal age;<br>4. Reduced blood supply;<br>5. Folic acid deficiency;<br>6. Radiation;<br>7. Racial mongoloids |
| Clinical features: | 1. Inability to suck the mother's milk;<br>2. Facial deformity;<br>3. Nasal intonation for the cleft palate;<br>4. Nasal regurgitation;<br>5. Tooth defects like supernumerary teeth peg lateral, germination, etc. |
| Syndromes associated with cleft lip and palate | **Autosomal Dominant:**<br>a: Vander Woude syndrome;<br>b: EEC (Ectrodactyl, ectodermal dysplasia, Cleft). |
| | **Autosomal recessive:**<br>a. meckel syndrome; b. Roberts syndrome<br>**X-linked:**<br>a. orofacial digital syndrome type-1; b. Isolated cleft palate with ankyloglossia<br>**Chromosomal:**<br>a. Trisomy 13; b. Trisomy 18<br>**Non-Mendelian:**<br>a. Pierre Robin syndrome; b. clefting with congenital heart disease<br>**Autosomal recessive:**<br>a. meckel syndrome; b. Roberts syndrome<br>**X-linked:**<br>a. orofacial digital syndrome type-1; b. Isolated cleft palate with ankyloglossia<br>**Chromosomal:**<br>a. Trisomy 13; b. Trisomy 18<br>**Non-Mendelian:**<br>a. Pierre Robin syndrome; b. clefting with congenital heart disease |

**Classification of cleft lip and palate:**

The following are some of the widely used classifications of cleft lip and palate.

1. Davis classification (1942):According to Davis,clefts are divided into(A) Group-1:Pre-alveolar clefts; (B)Group-2:Post-alveolar clefts; (C) Group3:Alveolar clefts.

2. Kaushal classification (1987):L:Lip; A:Alveolus;H:Hard palate; S:Soft palate; H:Hard palate; A:Alveolus; L:Lip[13]

Problems associated with cleft lip and palate:

**1. Ear problem:**Conductive hearing loss and chronic suppurative otitis media occur.

**2. Speech difficulties:**A:velopharyngeal insufficiency; B::Abnormal air

**3. Dental problem:**a.Local problemFused teeth, enamel hypoplasia, gemination, presence of natal and neonatal teeth,congenitally missing teeth,ectopically erupting teeth,anomalies of tooth morphology,aberrations in a crown shape.b.orthodontic problemAnterior and posterior crossbite, Spacing and crowding,deep bite

**4. Feeding difficulties:**Cleft lip: for an infant more difficult to suck on a nipple, Cleft palate: breast milk to be taken up into the oral cavity, Upper respiratory tract infection, and regurgitations should be frequent.

**5. Nasal deformity and esthetic problem:**A:poor nasal shape;B:poor lip function;C:poor dental alignment and smile[14]

**Management:**

To control cleft lip as well as cleft palate,many experts are associated with it. The crew members are:

**1. Maxillofacial surgeons:** Maxillofacial surgeons pick out who diagnose and deal with the abnormalities associated with the skeletal pattern of the skull, facial bones, and gentle tissues in coordination with specialists.

**2. Pediatrician:**The boom of the kid have to be monitored by using the prediction.

**3. Pedodontist and Orthodontist:** Pedodontist and orthodontist are those who evaluate the position and alignment of the jaws and enamel and coordinate a remedy plan.

**4. Speech specialist:** Speech expert During developmental stages, the kid is closely monitored and evaluated to assess the communicative abilities incomplete speech

**5. Otolaryngologist:** Ear contamination and listening to loss is managed

**6. Audiologist**:To help the evaluation and control of listening to difficulties

**7. Genetic counselor:** Medical and family history is reviewed to observe the kid's help in analysis.

**8. Nurse team co-ordinates** Specialized pediatric nursing with the care of the child.

**9. Social Worker:** The baby and their own family are guided and counseled to address social and emotional aspects.

**10. Prosthodontist:**

**11. Patient care-coordinator[15]**

**Role of Pedodontist in the management of cleft lip and cleft palate:**

**A. Feeding and nutritional device:** A cleft baby faces difficulty to suckle and encounters problems of nasal regurgitation and malnourishment. Advise proper feeding method 1: Breastfeeding; 2:Bottle feeding

**a. Breastfeeding:** Ensure if toddler requires prosthetic feeding equipment and in fabricated appropriately a: Require long feeding time; b: Lot of air is suckled thru cleft and consequences in aerophagia which calls for common burping after every 1/2 OZ of feed; c: Mothers have to be advised to take a look at the infant for chocking, cyanosis and stomach disinfection for the duration of feeding; d: Infants must be held at 30-forty five position

**b. Bottle feeding:** Advise the mother to preserve the toddler at 30-45 angulation or in an upright position. Use of suitable clean teats with good enough slit. Various kinds of teats: 1:Mead Johnson cleft palate nurser; 2: Habermanfeeder. Other normally used teats are: 1: Pigeon cleft teat; 2: Nucknipple; 3: Chu-chu clean feed teat; 4: Chu -chu pass reduce feed teat

**B. Dental Management:** A thorough examination,

research, and diagnosis of dental anomalies and sickness are necessary. A: Advice Safe diet; B: Prophylactic measures should be needed; C: Obtain proper impressions to fabricate an obturator; D: Educate both patients to keep clean gum pads; E: fluoride application; F: Sealant therapy; G: Early intervention of carious tooth; H: Reinforce the affected person to manage up and ward off mental stress; I: Monitor modifications in speech/heavily capabilities of the kid.[16]

**Orthodontic Management:** The orthodontic management of cleft lip and palate are:

A: Stage one: treatment done from birth to 18 months of age; B: Stage two (primary dentition stage): from 18 months to the fifth year of life; C: Stage three (mixed dentition stage): from sixth to eleven years of life; D: Stage four (during permanent dentition): From 12-18 yrs of age.

**Stage one treatment:** 1: Fabrication of passive obturator; 2: Presurgical orthopedics; 3: Surgical management of cleft lip; 4: Surgical management of cleft palate.

a. Passive maxillary obturator: It is a type of intraoral prosthetic device that reduces the incidence and feeding difficulties.

b. Presurgical orthopedics. Reduces the size of clefts and improved speech;

c. Surgical lip closure-Surgery should be performed within 45 days of birth. A rule often should be applied here. According to Millard,surgery should not perform less than 10 weeks of age, body weight is not less than 10 pounds and Hb not less than 10 grams%;

d. Surgical palate closure:(12-24 month of age)- It improves hearing,normal speech and improves swelling.[16]

**Stage two treatment:** 1: Intra-oral obturation adjustment;2:Check on eruption pattern; 3:Oral hygiene instructions;4:Restoration of decayed teeth

**Stage three treatment:** Mixed dentition stage, Secondary alveolar bone grafting

**Stage four treatment:** Regular oral hygiene and dietary counseling is required.

**Complication and Disadvantages:** 1: Skin irritation; 2: Ulceration of intramural tissue; 3: Irritation of oral mucosa tissue; 4: Parent compliance required.

**Diagnosis:** 1: Prenatal counselling; 2: Prenatal ultrasound-2D or 3D; 3: Color Doppler ultrasonography; 4:73%-feral cleft lip;5:1.4%-isolated cleft palate.[17-19]

## Conclusion

Treatment of cleft lip along with cleft palate should be done at the correct time. If behind schedule in remedy there may be the possibility of advanced abnormalities. So to prevent troubles like speech problems, facial asymmetry, feeding trouble, infection to the nasal cavity, and unaesthetic appearance the remedy is necessary. Oral clefts are the second most commonplace congenital anomaly. It frequently affects speech, hearing, cosmetics, and may at times lead to airway obstructions. The oral and maxillofacial health care professional is a key member of the cleft lip and cleft palate team, to perceive and manage many of the troubles.

**Funding:** Nil

**Conflict of Interest:** None

**Ethical Approval:** Approved

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