Republic of Iraq
Ministry of Higher Education
and Scientific Research
University of Baghdad
College of Dentistry

Assessment of cleft lip and palate

(Clinical and radiographic review)

A Project Submitted to

The College of Dentistry, University of Baghdad, Department of Oral Diagnosis in Partial Fulfillment for the Bachelor of Dental Surgery

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2022

Certification of the Supervisor

I certify that this project entitled " Assessment cleft lip and palate "(Clinical and radiographic review)

Was prepared by the fifth-year student " Saja Mahmood Jassim" under my supervision .

At the College of Dentistry/University of Baghdad in partial fulfilment of the graduation

requirements for the Bachelor Degree in Dentistry.

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Date: 2022

Dedication

Dedicated to the eyes whose sun has disappeared from the world of mankind and shone in the gardens of bliss (My martyr father**).

To the one who cut the cup empty so that I can water a drop of love for me from its fingertips and offer us a moment of happiness to the one who harvested the thorns from my path to pave the path of knowledge to the white heart (My beloved mother**).

To pure and gentle hearts and innocent souls to the winds of my life (My sisters and brother**).

Acknowledgment

My faithful thanks to **ALLAH for granting me the will and strength with which this research was accomplished.

** I wish to express my sincere appreciation to my supervisor, **Dr. Zainab Al-Bahrani**, who has guided and encouraged me to beprofessional and do the right thing. Without her persistent help, patience and motivation the goal of this project would not have been realized.

** I wish to show my gratitude to the person who taught me the meaning of life my beloved and **supportive mother**.

** To the one I miss with all my heart, to the one who left our world, and the sound of his advice still guides me. To the symbol of devotion and sincerity, which fate did not allow to see me as he dreamed and died in the prime of youth .... **my father.**

** Finally, I acknowledge the support of my best friend **Lamees Hamid** and her advices and encouragement.

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Introduction

More than four million children are born with birth defects worldwide every year. Craniofacial anomalies comprise a large fraction of all human birth defects, less frequent only than congenital heart disorders and clubfoot. Cleft lip with or without palate is the most common craniofacial birth defect with an estimated quarter of a million affected babies born each year in the world. This malformation shows considerable variation across geographic regions and ethnic groups and has significant medical, psycho- logical, social, and economic factors. It is a costly public health problem. **(Bale et al,2003)**

The World Health Organization (WHO) and most cleft organizations across the globe recommend care by a team of specialists, however, surgical and non-surgical treatment is often associated with socio-economic factors and access to medical facilities. The delay in treatment and combined with incomplete follow-up, results in poor outcomes with unnecessary complications.

All Birth defects including cleft lip and palate are emerging as a cause of neonatal mortality. The strategies proposed to reduce the global impact of birth defects include:

(1) effective family planning, genetic counseling, and prenatal diagnosis.

(2) education for couples to decrease maternal exposure to avoidable environmental risk factors such as tobacco, alcohol, and teratogenic medications.

(3) improving the availability of medical and surgical care locally for the affected infants.

the initial diagnosis of cleft lip and palate is performed by prenatal ultrasonography which can diagnose most cases with obvious physical changes. If a cleft has not been detected in an ultrasound before the baby is born, a physical examination of the mouth, nose and palate can diagnose cleft lip or cleft palate after a child's birth with careful interpretation of different maxillofacial imaging technique to prevent any complications prior to Surgical correction techniques and or orthodontic treatments for repair of various cleft sub-types. Adjunctive services such as use of prophy- lactic ventilation tubes, presurgical orthopedics, psy- chological counseling, speech

therapy, and feeding interventions before and after surgery are also being monitored and assessed. **(Mulliken ,2001).**

AIM OF THE STUDY

The aim of this review study is to describe the various viewpoints associated with of cleft lip and palate starting with Dignosis of the cleft lip and palate using different imaging modalities, and then address the management techniques to overcome its complications**.**

Epidemiology

Cleft lip with or without palate has an average birth prevalence of 1:700 ranging from 1:500 to1:2000, depending on the race. There are wide ethnic variations with highest occurrence in Native Americans (3.6:1000), followed by Asians(2.1:1000 Japanese births and 1.7:1000 Chinese births),Caucasians (1:1000), and lowest in those of African descent (0.3:1000). Cleft of palate only , which differs genetically from cleft lip and palate, has birth prevalence rate of 1:2000 and is more similar across all populations. About half of the oral clefts involve lip and palate (46%), a third of the clefts involve only the palate (30%), and clefts of lip alone account for(24%). Cleft lip and palate is more often unilateral than bilateral and more common in males than females. The unilateral defects occur more often on the left side than the right side. Clefts of lip occur in the ratio of 6:3:1 for unilateral.**(Mossey, 2007).**

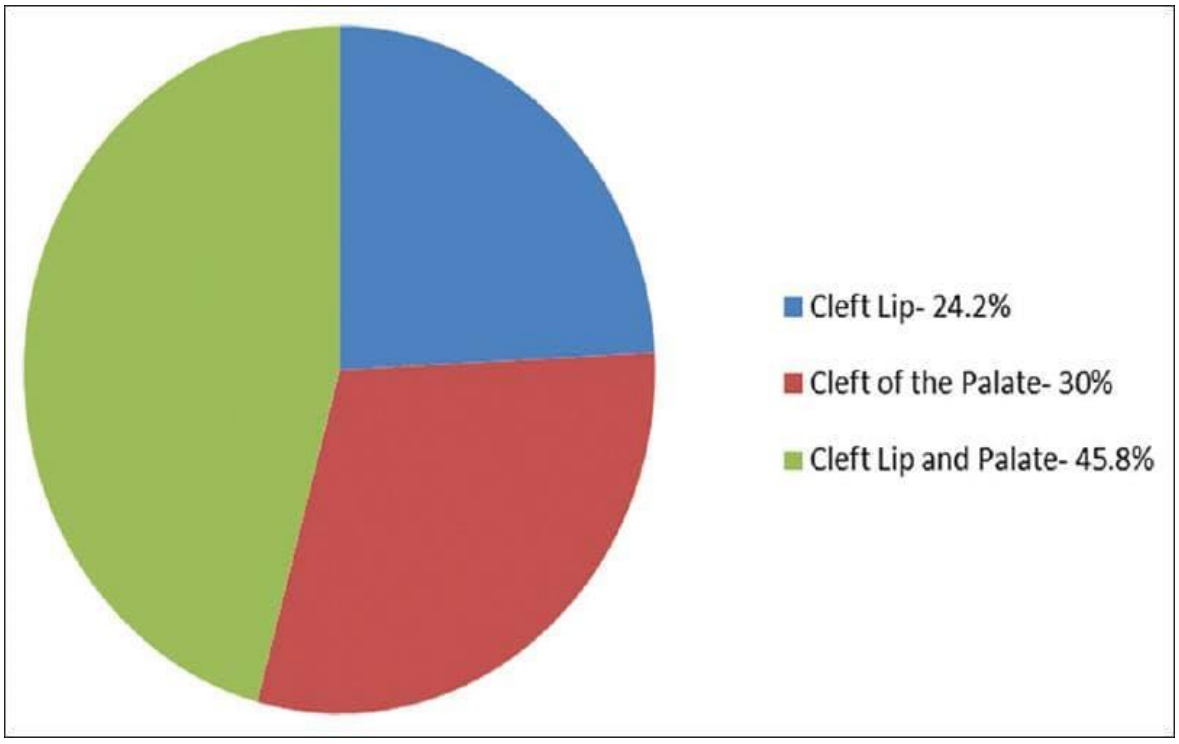

Fig.(1): pie chart showing epidemiology cleft lip with or without palate(Zachay,2015).

Etiology and genetics

Non-syndromic cleft lip and palate is a complex trait with multifactorial etiology, resulting from gene–gene and gene–environmental interactions. Identification of key genes contributing to the genesis of orofacial clefts will help in early diagnosis, disease prevention, or possibly developing adjunctive therapies. The most recent estimates suggest that anywhere from 3–14 genes contribute to cleft lip and palate. Candidate genes and loci responsible for non-syndromic cleft lip and palate have been identified on chromosomes 1, 2, 4, 6, 11, 14, 17, and 19. Two genes IRF6 and MSX-1 now seem to explain about 15% of isolated cleft lip and palate . Important contributors to cleft lip and palate are variants of interferon regulatory growth factor (IRF 6) gene, whose function is related to the formation of connective tissue. **(Vieira, et al 2005,).**

Environmental factors that contribute to the etiology of facial clefting disorders include cigarette smoking, folic acid deficiency during the periconceptional period maternal exposure to alcohol and teratogenic medications such as retinoids, corticosteroids, and anticonvulsants (phenytoin and valproic acid). Co-sanguinous marriages, maternal diabetes, and obesity have also been linked to an increased risk of orofacial clefts. Less consistent associations have been found between clefts and maternal viral infections such as rubella and varicella. The risk of recurrence of a cleft condition is determined by a number of factors, including the number of family members with clefts, their relationship to family members with clefts, race and sex of the affected individuals, and the type of cleft. **(Zucchero, et al 2004).**

Embryology

The embryologic development of the face begins at 4 weeks after conception from the neural crest that forms five prominences; the frontonasal process, and paired maxillary and mandibular processes surrounding a central depression. During the fifth and sixth weeks of embryonic development, bilateral maxillary processes derived from first brachial arch fuse with the medial nasal process to form the upper lip, alveolus, and the primary palate .The lateral nasal process forms the alar structures of the nose. The lower lip and jaw are formed by the mandibular processes. This process of formation of the face is the consequence of a cascade of processes

that involve cell proliferation, cell differentiation, cell adhesion, and apoptosis. Failure or error in any of these cellular processes that lead to fusion of the medial nasal process with the lateral nasal and maxillary process can cause orofacial clefts . The formation of the secondary palate begins during the sixth week after conception from the two palatal shelves, which extend from the internal aspect of the maxillary processes. During the eighth week, these bilateral maxillary palatal shelves after ascending to an appropriate position above the tongue, fuse with each other and the primary palate. A disruption in the fusion of these embryonic components can occur due to delay in elevation of the palatal shelves from vertical to horizontal, defective shelf fusion or postfusion rupture resulting in a cleft of the secondary palate. **(Sperber, 2001).**

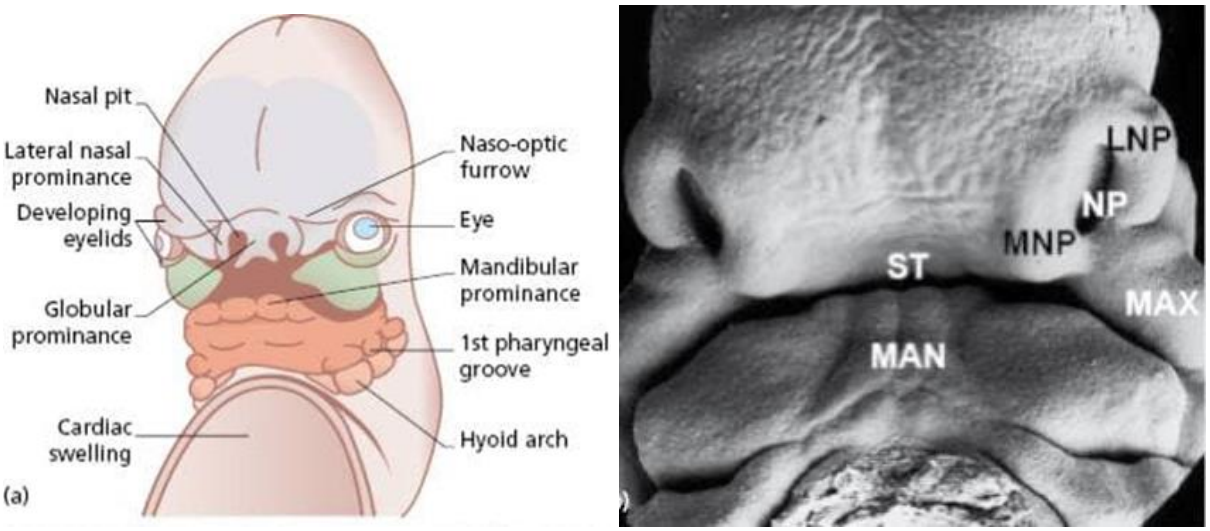

Fig.(2): (a) Schematic diagram showing embryonic development of face at 6 weeks. (b) Electron microscopy showing the development of face of a 37-day-old human embryo. (Sperber, 2001).

Classification

In order to standarize documentation and communicate effectively, various types of classification systems have been described. The early Veau classification included groups 1–4 with increasing severity of clefting:

• group 1 – cleft of the soft palate;

• group 2 – cleft of the hard and soft palate up to incisive foramen;

• group 3 – complete unilateral cleft lip and palate;

• group 4 – complete bilateral cleft lip and palate.

However, this classification is not always adequate to document the variations. The more sophisticated schematic diagrams, such as the one described by **(Sperber, 2001).**

1. Clefts of lip and alveolus.

2. Clefts of primary (including lip) and secondary palate.

3. Clefts of secondary palate only.

4. Submucous cleft. **(Millard, 1977).**

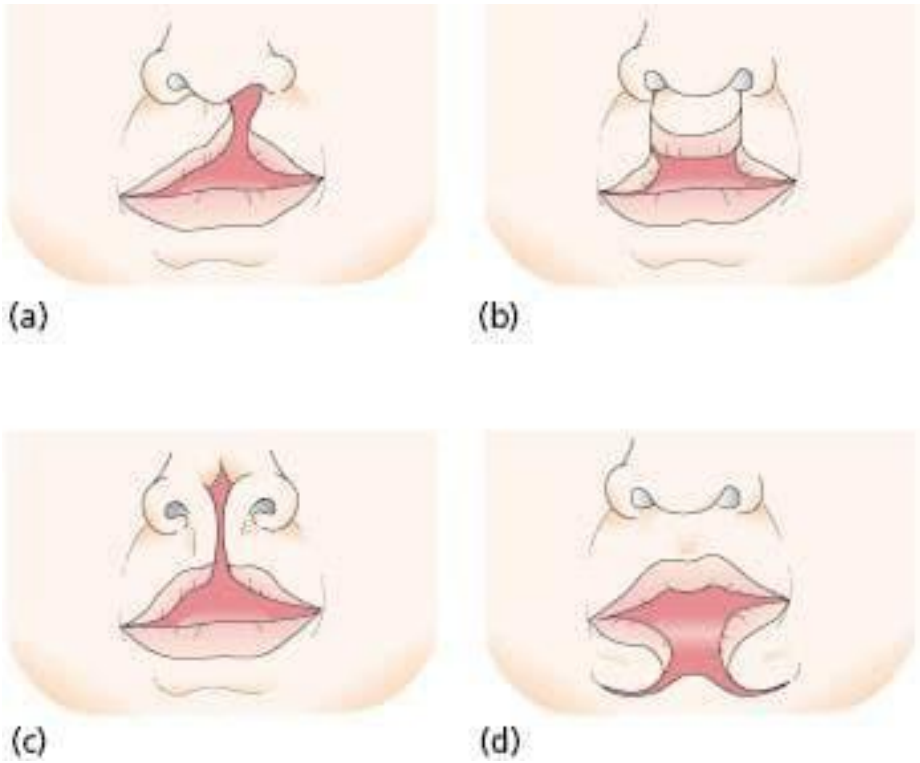

Fig.(3): (a) Unilateral cleft of upper lip. (b) Bilateral cleft of the upper lip. (c) Midline cleft of the upper lip and nose. (d) Median mandibular cleft. (Sperber, 2001).

Management of the cleft individual

General assessment

Every child born with a cleft lip and palate should be thoroughly assessed by complete physical examination and necessary diagnostic imaging and tests to check for associated systemic abnormalities, including congenital heart, renal, or airway anomalies. A proper airway assessment should be priority for a newborn with congenital craniofacial anomalies. Infants are obligate nasal breathers. It is important to check if there is obstruction at any level in the upper or lower airway, including the nares and choanae. If the child is delivered in a nonmedical facility or a small hospital they should be referred to a hospital with specialists or a craniofacial team for further evaluation. A proper airway assessment, and counseling for nutrition and feeding should be initiated immediately**.(Mulliken and Benacerraf 2001).**

Imaging assessment

Conventional Radiography

Radiography is helpful for diagnosis of cleft lip and palate; extraoral and intraoral dental radiographs are used to detect associated dental anomalies that combined the cleft palate patients. The typical radiographic appearance is a well-defined vertical radiolucent defect in the alveolar bone and numerous associated dental anomalies. These anomalies may include the absence of the maxillary lateral incisor and the presence of supernumerary teeth in this region. The involved teeth often are malformed and poorly positioned. Panoramic and lateral cephalometric views are indicated In patients with cleft lip and palate due to increased incidence of hypodontia in both arches and there may be a mild delay in the development of maxillary and mandibular teeth. The osseous defect may extend to include the floor of the nasal cavity. In patients with a repaired cleft, a well-defined osseous defect may not be apparent but only a vertically short alveolar process at the cleft site. **(J Mossey and Davies 2007)**

Panoramic radiographs can be used for screening in Patients with clefting of the lip and primary palate that may demonstrate supernumerary or missing teeth, which may manifest as abnormal eruption patterns. The permanent lateral incisor is often congenitally missing. If present, it must be located in the primary palate (greater segment). Supernumerary (extra) teeth are common in the lesser segment (secondary palate) anterior to the canine. The ipsilateral canine is almost always located in the lesser (more posterolateral) segment. During childhood and adolescence, the permanent incisors or canines can erupt into the cleft, resulting in poor periodontal support and a compromised prognosis. For this reason, it is important to identify the presence or absence and position of developing teeth. Alveolar cleft repair and bone grafting is typically completed before canine eruption to prevent tooth loss. Missing or lost teeth can be replaced with dental implants and/or dental prosthetics after alveolar bone grafting and orthodontia. **(El Deeb et al, 1982) .**

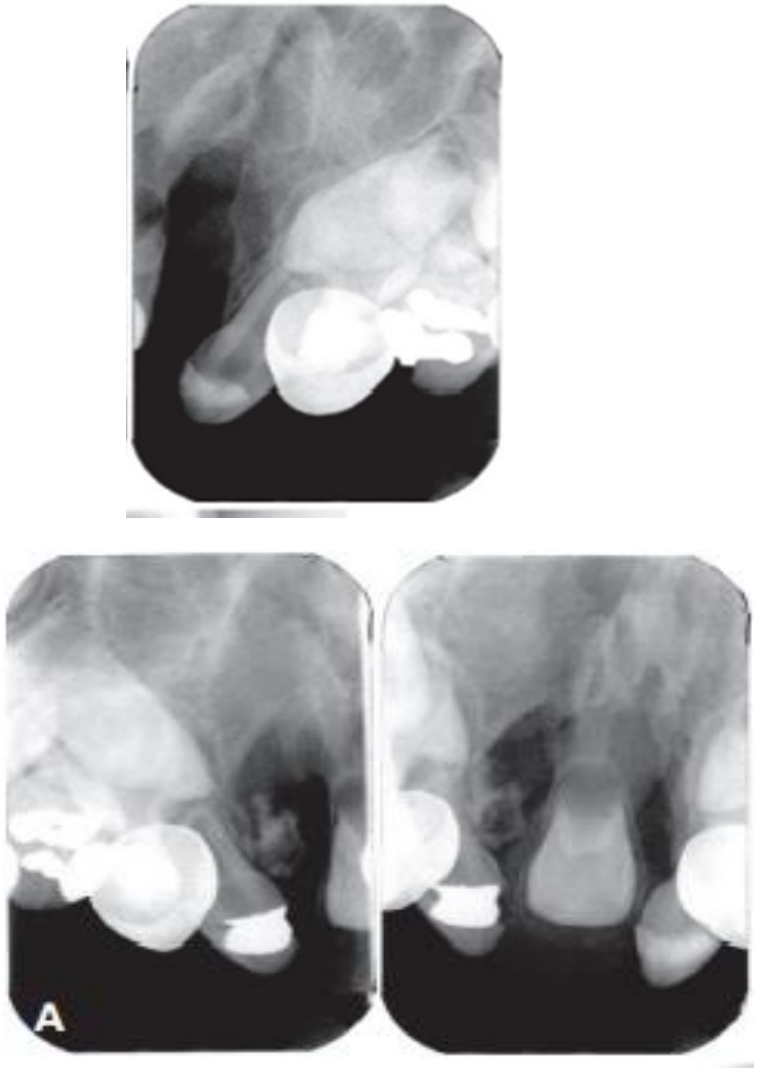

Fig.(4): Intraoral radiographic (A) Bilateral clefts of the maxilla in the lateral incisor regions and defects of the dentition. (White and Pharoah,2014).

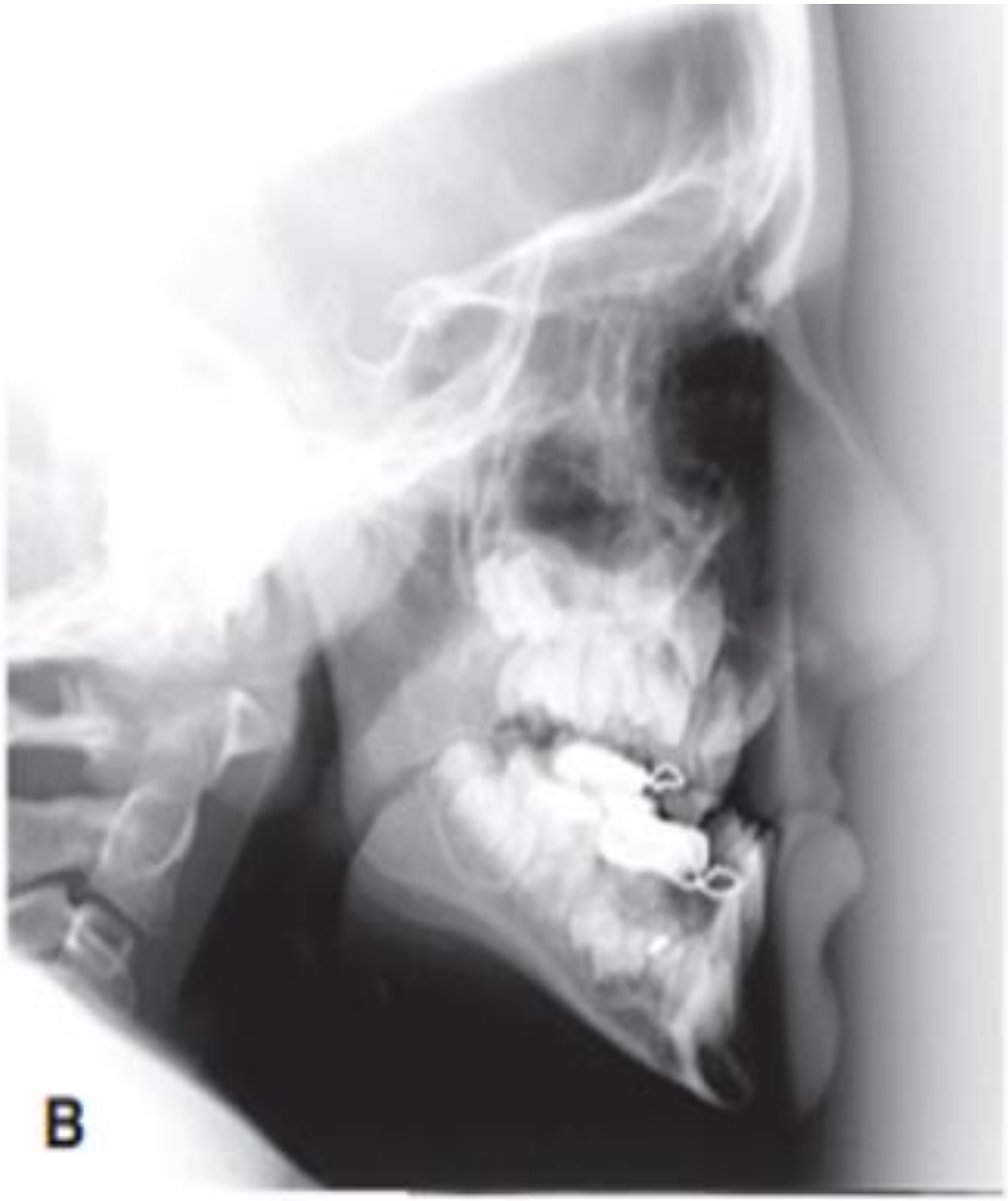

Fig.(4): (B)Lateral cephalometric view shows underdevelopment of the maxilla. (White and Pharoah,2014)

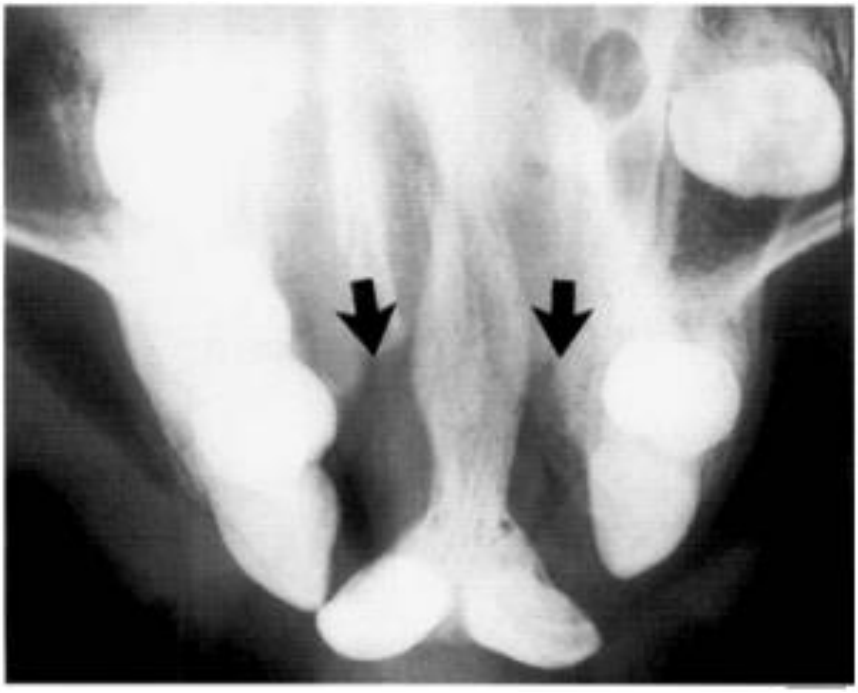

Fig.(5): Upper standard occlusal showing a bilateral cleft palate (arrowed). Both lateral incisors are absent. (Whaites 2007).

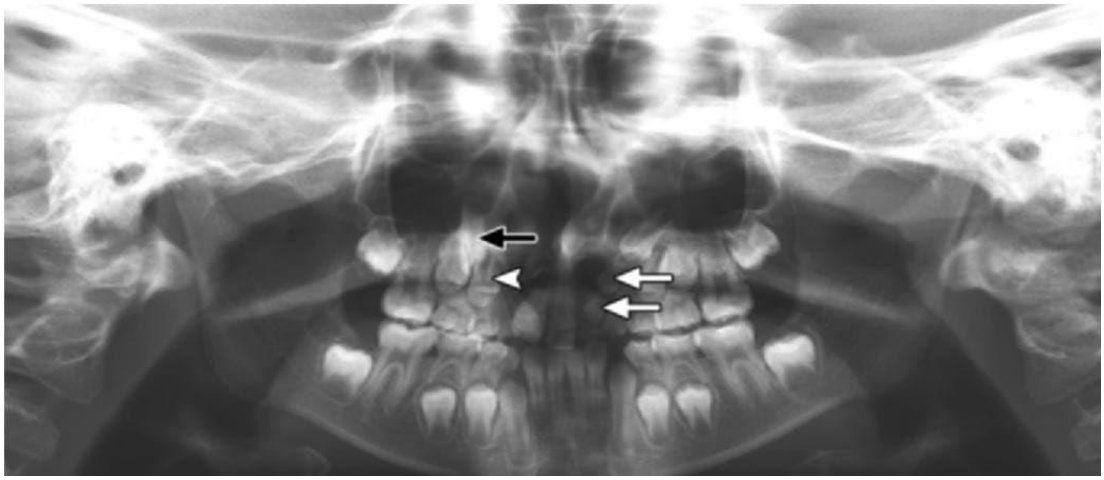

Fig.(6): Panoramic radiograph: Claft palate alveolus. (Zachary2015).

Ultrasonography

Conventional US can depict cleft lip and palate with use of standard views. The coronal view allows visualization of the nares and upper lip. The midsagittal view depicts the hard and soft palate, and the axial view demonstrates the maxillary alveolar ridge . Three dimensional (3D) US allows better diagnosis of cleft lip and palate, and surface renderings are useful to help prepare parents psychologically and can also be used by the medical teams for postnatal management. **(Mulliken and Benacerraf 2001, Maarse et al,2010).**

cleft lip is typically appreciated using angled coronal imaging and appears as a hypoechoic region in the upper lip (Fig 4). This can be corroborated by similar findings seen in the axial plane or at 3D US. A cleft of the maxillary alveolus may be more difficult to detect. At US, the fetal tooth buds are highly echogenic once mineralization begins. Therefore, a cleft of the tooth bud–bearing alveolus can be seen as a linear hypoechoic region within the echogenic dental arch. This finding can be particularly useful in cases of unilateral cleft lip. Bilateral complete cleft lip is typically easily visualized because the entire premaxillary segment protrudes from the face and can manifest as an echogenic mass. The degree of Maarse W, Bergé SJ, Pistorius which can be seen in the sagittal view, should be documented in the report because it may assist the surgeon in deciding whether preoperative dentofacial orthopedic manipulation will be required. **(Nyberg et al,1992).**

3D US may assist in detection of cleft palate as well as aid in physician understanding and patient and family education. Three-dimensional US offers the advantages of soft-tissue surface rendering and greater bone detail. Color Doppler US can also be used to assess nasal breathing. Flow seen only above the palate suggests that the palate is intact. Abnormalities in fetal swallowing may suggest the presence of a cleft palate. The majority of fetuses with cleft lip have an associated cleft palate, and cleft palate is more common if the fetus demonstrates micrognathia or complete cleft lip. **(Aubry 1992).**

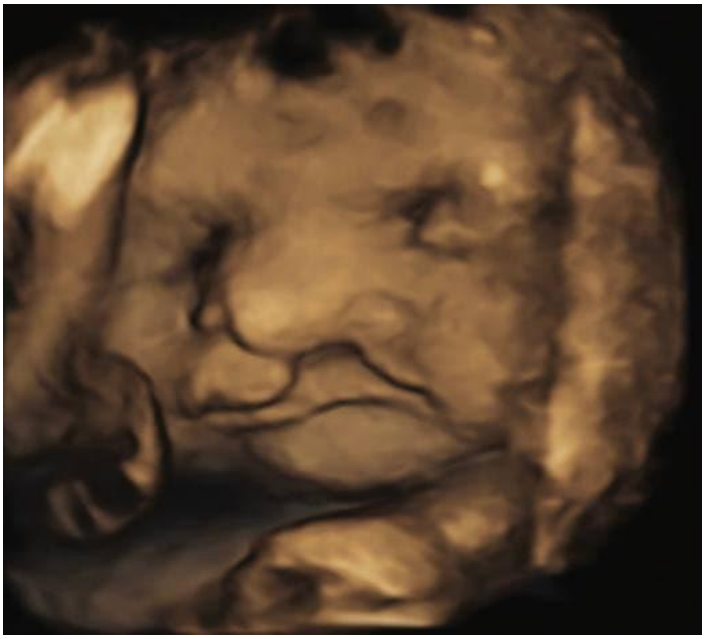

Fig.(7): Ultrasound image in a fetus. (Zachary2015).

Computed Tomography

Computed tomographic (CT) imaging of CLP is particularly useful for demonstrating bone and dental anatomy and is often used before repair of dentofacial deformities; multiplanar reformations of helical Computed tomographic images with use of bone and soft-tissue algorithms can help depict anatomic abnormalities, and 3D reconstructions can aid in surgical planning as well as patient and family Jensen BL, Kreiborg S, Dahl E, Fogh-Andersen. Intravenous contrast material is not typically required. **(Nyberg 2010, Whaites 2007).**

Plain Computed tomographic is usually performed for patients with complicated or syndromic cleft palate, from the skull base to the entire mandible the Helical mode is used during scanning. Depending on the patient's body habitus, Computed tomographic parameters is altered. The images are obtained in axial acquisition at 5-mm thickness, and reformatted to 0.62-mm slices. For young children and infants, studies adopt 80 kVp, 125 mAs and pitch of dentofacial. Multiplanar images are used to better demonstrate bone anatomy and perform measurements. Patients are imaged in a supine position. Normally the hard palate should be intact without any

defect. In the case of cleft palate, there will be bony defect within the hard palate, cleft palate sometimes is associated with micrognathia and glossoptosis and requires additional correction procedures. Length of the mandibular ramus can be measured using sagittal oblique reformatted images. **(Nyberg,2010).**

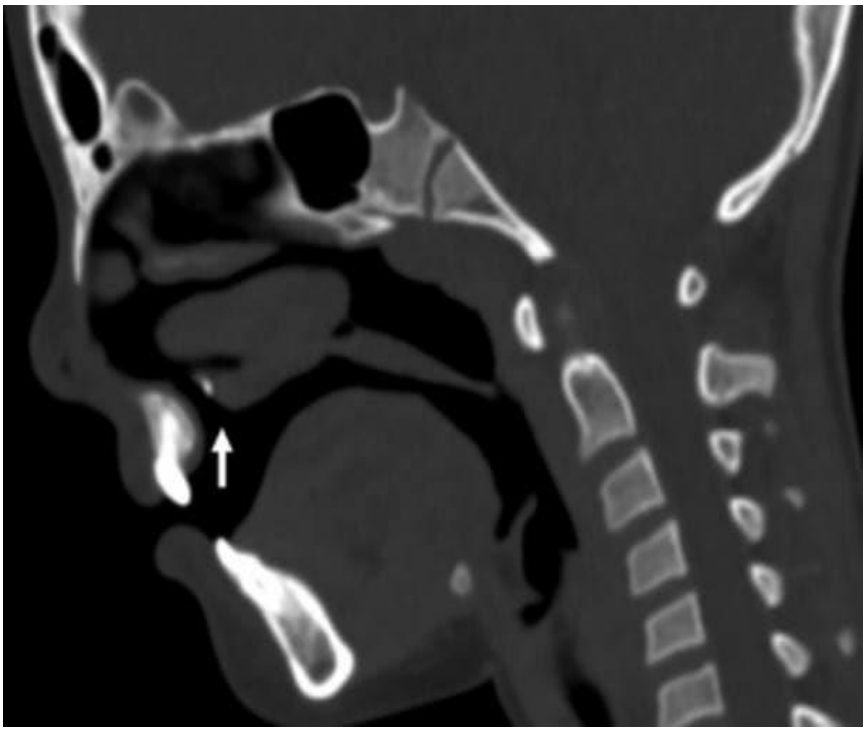

Fig.(8): Sagittal oblique CT images. (Zachary2015).

MR Imaging

MR imaging is the criterion standard for evaluation of possible associated intracranial abnormalities in the setting of CLP or cleft palate. Prenatal (fetal) MR imaging can aid in confirmation and characterization of the cleft itself as well as associated intracranial and extracranial findings. Postnatal MR imaging is not typically required for characterization of the cleft itself.Although cleft palate can be seen on sagittal MR images, coronal MR images best depict cleft palate. Axial MR images may help confirm the integrity of the maxillary arch. T2-weighted MR imaging with or without fat saturation can be helpful. Intravenous contrast material is not typically required for evaluation of cleft lip or cleft palate. **(Stroustrup,2004).**

In patients with primary cleft palate and those with failed primary repair, the soft palate appears shortened with a widened distance between the soft palate and posterior pharyngeal wall. The levator veli palatini muscle sling appears thinned. Magnetic resonance imaging T2-weighted oblique coronal image showing thinning of the levator veli palatini muscle at the midline which is filled with fibrous tissue, while the sagittal image showing relative horizontal orientation of the levator veli palatini muscle sling in oblique coronal image the muscle sling of the levator veli palatini appearing smooth with augmented muscle bulk, No focal depression at the midline could be seen. T2-weighted sagittal image showing more vertical orientation of the levator veli palatini muscle sling in the midline, which is filled with fibrous tissue. **(Stroustrup 2004, Whaites 2007).**

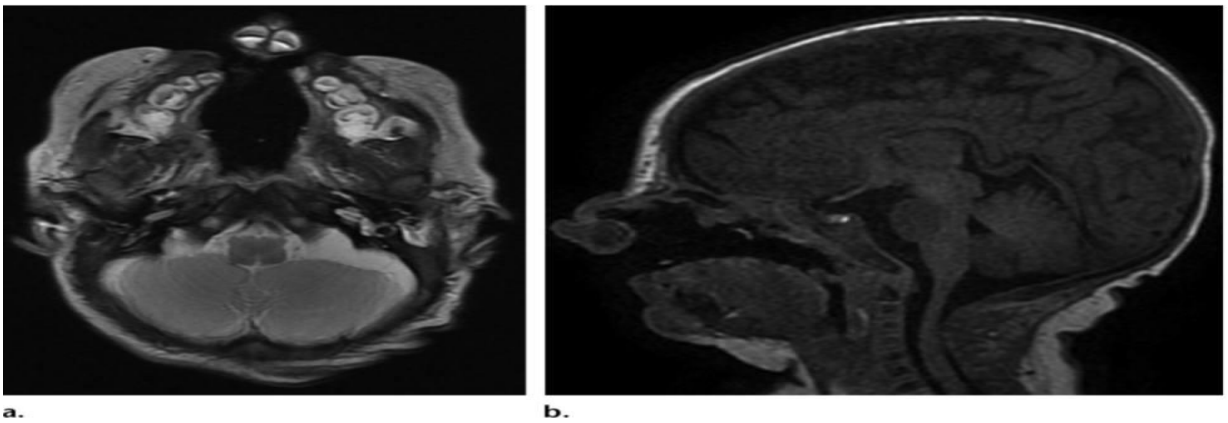

Fig.(9): MR images in a 3-week-old boy show bilateral complete cleft lip and pal- ate with a protrusive premaxillary segment. (Zachary2015).

Complications associated with cleft lip and palate

Feeding and nutrition complications

Feeding is one of the first complications in a child born with a CL/P. Parents should be taught how to feed the baby and informed about various feeding nipples that can deliver more milk under less pressure. The goal is to provide adequate nutrition to satisfy the caloric requirements and avoid failure to thrive. The team nurse generally provides the parents with information on feeding before birth or immediately after birth. However, the presence of a cleft palate makes it difficult to create a negative pressure that is necessary to feed. **(Glenny et al,2004).**

Ear, nose, and throat complications

Children born with a cleft of the palate may have associated micrognathia, glossoptosis, and airway obstruction. In these children, one should look for signs of increased effort while breathing, stridor, weight loss, and failure to thrive. Parents should be informed to watch for an abnormal breathing pattern or respiratory distress, particularly during upper respiratory tract infection. If there are signs of obstruction, a pediatric otolaryngologist should consulted to perform an endoscopic evaluation of upper and lower airway to look for possible any cause of obstruction. An audiology assessment is recommended soon after birth to check for hearing abnormalities. Children with cleft palate exhibit a higher frequency of otitis media prior to palate repair than those without clefts. Middle ear ventilation disorders due to eustachian tube dysfunction can cause conductive hearing loss. This can also contribute to speech and language delay in these children. Although not as common as conductive hearing loss, sensorinerual hearing deficits exist within the cleft population and it has an affect on speech perception and clarity, as well as auditory comprehension skills. **(Rohric et al 1996).**

Mangment of cleft lip and palate

1-Presurgical orthopedics treatment

The benefits of presurgical orthopedics include better alignment of the alveolar segments and premaxilla, tension-free approximation of the cleft lip edges, and improvement of nostril symmetry and shape. Presurgical orthopedics was introduced in the management of clefts by McNeill and Burston. They initiated the use of a palatal acrylic plate in order to bring the collapsed maxillary alveolar segments into proper alignment prior to lip surgery. Latham described use of an active expansion device to align the collapsed lateral maxillary segments and retract the premaxilla in complete bilateral clefts, and to achieve symmetry of the alveolar arch in complete unilateral clefts. Grayson and others have shown that gentle application of presurgical orthopedic forces to mold the alveolar segments and the nostrils within 0–3 months of birth has shown some benefits in correction of the nasal deformity in children with complete bilateral CLP and wide unilateral clefts. Nasoalveolar molding increases the surface area of the nasal mucosal lining. It also helps with elongation of the columella and making the columella upright. This preoperative expansion of the nasal lining allows suturing of interdomal cartilages without tension and decreases widening of the nose. **(Millard et al 1988, Berkowitz et al 2004, Spengler et al 2006).**

2-Surgical treatment

Cleft lip repair

The goal of primary lip repair is to reconstruct a functional lip with minimal scarring and normal appearance. The timing for primary lip repair is usually between 3 and 6 months after birth. Most craniofacial centers follow the rule of ten's to ensure that the infant is fit for the surgical procedure. This rule implies that the infant should be at least 10 weeks of age, weigh at least 10 lbs, and have a hemoglobin level of at least 10 g/100 ml. Lip repair is performed under general anesthesia A surgical lip adhesion may be preferred as an initial surgical procedure within 6–8 weeks after birth in some centers. Lip adhesion helps to align the maxillary alveolar segments and achieve a tension-free definitive lip repair at a later date. Good approximation of the alveolar segments also allows the surgeon to perform a gingivoperiosteoplasty at the time of definitive cheiloplasty. The disadvantages of converting the complete cleft lip to an incomplete one by lip adhesion are the need for an extra operation and

the possibility of excising more tissue at the time of definitive lip repair**(Gunawardana et al,1999)** cleft lip repair is devided into:

a_Unilateral cleft lip

Unilateral cleft lip is an asymmetric deformity that presents with a multitude of inherent anatomic variations . The most visible anatomic abnormalities of the complete unilateral cleft lip and nose deformity are due to the abnormal position of the orbicularis oris muscle An adequate repair of the unilateral lip deformity should correct the alignment of the orbicularis oris muscle, create a cupid's bow and philtral column on the affected side. In the unilateral defect the normal side can be used as a guide to identify the key points and to plan the incisions on the cleft side. Despite inherent variations there are some similarities that form the basis of the guiding principles in surgical repair of this deformity. **(La Rossa2000).**

b_Bilateral cleft lip

Bilateral cleft lip repair is much more challenging and the results are often less satisfactory than those of unilateral cleft lip. Complete bilateral clefts of lip are rare, accounting for only 10% of cleft lips and therefore the experience in treating these deformities is limited. The typical anatomical abnormalities that make the bilateral cleft lip deformity so difficult to repair are the absence of muscle in the prolabial segment, resulting in lack of philtral dimple, philtral columns, white roll margin and the median tubercle. The prolabium lacks the angular peaks and the typical cupid's bow. The premaxilla is protuberant and sometimes deviated to one side making tension-free approximation of muscle and cleft margins difficult. The orbicularisoris muscle which is in the lateral lip elements inserts at the alar base on each side. The accompanying nasal deformity consists of a columella that is abnormally short, a wide nasal tip, and a flared alar base due to the malpositioned, splayed alar cartilages. The basic principles guiding repair of the bilateral cleft lip deformity are: maintaining symmetry; establishing muscle continuity; designing the prolabial flap to achieve appropriate philtral width and shape; forming a cupid's bow and median tubercle from the lateral labial tissue; and finally repositioning the alar cartilages to construct the nasal tip and columella . The principles outlined here are those of the Mulliken simultaneous lip and nose repair. **(Stroustrup et al 2004).**

cleft palate Repair

palate can range from a minor submucous cleft affecting only the soft palate to a complete bilateral cleft Cleft affecting posterior nasal spine or translucency in the mid palatine region of the soft palate due to lack of the primary and secondary palate. It is important to look for these signs include a bifid uvula, notching of the muscle. The muscles of soft palate that help with the function of speech and swallowing include the levator palatini, tensor palatini, palatopharyngeus, palatoglossus, and musculus uvulae. The goals of palate repair are to normalize by surgical approximation and realignment of the aberrant attachments of the palatal muscles, and to seal the communication between the oral and nasal cavities without fistulae.The surgical technique for repair of the complete unilateral and bilateral cleft of the palate is performed by *The use of two-flap palatoplasty ;*The edges of the cleft speech are incised from the alveolus to the base of the uvula and bilateral full-thickness mucoperiosteal flaps are reflected . The levator palatini muscles are released and dissected to be repositioned horizontally and sutured. Bilateral releasing incisions are made to decrease the tension in the midline.For the cleft of the secondary palate a Von Langenbeck repair can be used. In this technique bilateral releaxing incisions are made and the mucoperiosteum is elevated to complete the stripping and closure of nasal layer, muscle, and oral layers**. (Kriens 1975, Vacher et al 1997).**

1- Orthodontic treatment

The orthodontist plays an important role in the care of the cleft individual during infancy, mixed dentition and permanent dentition . Presurgical orthopedic treatment is facilitated by the orthodontist at 2–10 weeks after birth in infants with wide clefts and poorly aligned alveolar segments or a protruding premaxilla. In the early mixed dentition phase, children with complete clefts of lip and palate often have a posterior

and anterior crossbite. The crossbite is asymmetric in unilateral clefts, affecting mainly the lesser segment or cleft side. In bilateral clefts, there is collapse of both lateral segments with a bilateral posterior crossbite and protrusion of the premaxilla. The goal of orthodontic treatment in this phase is to prepare for repair of the alveolar cleft by expanding the maxillary alveolar segments, and correcting the position of rotated maxillary incisors. **(Tindlund 1994).**

Orthodontic management in cleft individuals

2–10 weeks Presurgical orthopedics

6–10 years Phase I orthodontics:

Maxillary expansion for alveolar bone graftingMaxillary protraction with face mask when indicated.

10–14 years Maintain maxillary expansion and alignment of teeth Monitor facial growth and eruption of permanent teeth Orthodontic treatment with distraction of maxilla if deficiency is severe.

14–18 years Phase II orthodontics:

Orthodontic treatment with full fixed appliances to align teeth Prepare for orthognathic surgery when Indicated Extract teeth if arch is crowded Decide whether to replace/substitute the absent maxillary lateral incisor.**(Tindlund 1994).**

2- Replacement of absent teeth in the line of the cleft

Congenital absence of the maxillary lateral incisor in the line of the cleft can be managed appropriately by closing the space and substituting the adjacent canine in its position or by opening space and replacing it with a fixed or removable prosthesis.

The substitution of the lateral incisor with the adjacent canine is cost effective; however, it can result in loss of arch length and decrease in transverse dimension of the maxillary arch. It can also be unesthetic due to the asymmetry in tooth size and shape in unilateral cases. Replacement with an endosseous implant is an option when there is adequate space and bone quantity. A removable prosthesis should also be considered when there is loss of premaxilla, severe deficiency of bone height and width with scarring of the overlying soft tissues tissue, and lack of lip support. Use of teeth-supported fixed prosthetic restorations, such as a bridge, across the unrepaired alveolar cleft segments should be avoided, as movement of the cleft segments results in failure of the prosthesis and loss of abutment teeth. **(Kearns et al 1997).**

3- correction of secondary lip and nose deformities

The final phase of treatment for the cleft patient involves correction of the residual lip and nasal deformities to achieve balanced facial esthetics. Typically, the lip and nose revision is performed during late adolescence after skeletal correction of maxillary hypoplasia, and after postsurgical orthodontic treatment is completed to provide a stable dental occlusion. Secondary lip deformities Secondary lip deformities that require correction are mainly asymmetries or disproportions. For the majority of patients where the primary repair was carefully planned and executed, secondary lip revisions are minor**. (Hubli et al,2000).**

Conclusion

General full assessment and Imaging of cleft lip and palate and isolated cleft palate necessitates familiarity with the clinical entities, treatment plans, and multiple

imaging modalities used for diagnosis, treatment planning, and follow-up screening. cleft lip and palate and isolated cleft palate are distinct entities with shared radiologic appearances. Distinguishing these two diagnoses may assist in diagnosis of dental and extra-facial anomalies. Advances in clinical and imaging have made possible the prenatal diagnosis of cleft lip and palate and detection of associated anomalies.

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