DOWNLOAD PDF GROWTH AND DEVELOPMENT OF MAXILLA AND MANDIBLE

Chapter 1 : DEVELOPMENT OF THE MANDIBLE AND MAXILLA by Ali Khidr on Prezi

DEVELOPMENT OF MAXILLA Maxilla forms within the maxillary prominences extending ventrally from the dorsal aspect of a much larger mandibular swelling. Ossification of maxilla begins slightly later than in the mandible.

Pre natal growth of mandible Nasomaxillary remodelling: Intramembranous bone lies lateral to cartilage. First ossification centre for each half arises in 6 th week in region of bifurcation of IAN into mental, the ossification spreads dorsally and ventrally to form ramus and body. Ossification stops at site where it would be lingula. Medially it meets its fellow counter part,distally upto middle ear. Secondary accessory cartilages occur bet th weeks to form head of condyle, coronoid,mental protuberence Coronoid cartilage: By 14 th wk, 1 st evidence of endochondral bone formtation Condyle cart is an imp growth centre for ramus. Condylar growth ia at its peak at puberty. Occurs months post natally,2halves fuse into synostosis Maxillary Tuberosity: Mandible appears as single bone. Basal bone forms one unit to with alveolar, condylar , coroniod , angular process and chin is attached. They grow by functional matrix theory Teeth act as functional matrix for development of alveolar bone Temporalis influences coroniod process Masseter n med pterygoid â€" at angle Lateral pterygoid â€" at condyle Key ridge: Post natal growth of mandible The nasal airway: Condylar cartilage Secondary cartilage Dual in function a Articular b Growth Not a primary centre for growth ,but Secondary in evolution Secondary in embryonic origin Secondary in adaptive responses to changing developments Orbital growth: Ramus It provides an attachment base for masticatory muscles. It positions the lower arch in occlusion with the upper. It is continuously adaptive to the multitude of changing craniofacial conditions. Moves progressively posterior by Deposition Posterior part Resorption Anterior part Pre natal growth of mandible: Superior part of ramus below sigmoid notch Lingual: Resorption Lower part of ramus below the Coronoid process Buccal: The mandible as a whole displaces anteriorly and inferiorly. The former anterior part of the ramus becomes the corpus by resorptive and depository remodeling. The lingual tuberosity Major site of mandibular growth and remodeling. Direct anatomic equivalent of the maxillary tuberosity. Effective boundary between the basic structures- ramus and corpus. Grows posteriorly by deposits on the on its posterior surface Its prominence is augmented by the presence of a resorptive field below it, lingual fossa. Simultaneuosly the part of the ramus behind the tuberosity remodels medially Post natal growth of mandible: Ramus to corpus conversion The anterior border of the ramus resorbs relocating the ramus in a posterior direction. Post Natal Growth And Development: Coronoid process- its lingual surface faces posteriorly superiorly medially all at once. Deposits of bone on the lingual surface bring about growth superiorly, posteriorly and medially. The buccal surface of the coronoid process undergoes resorption. The area of the ramus below the sigmoid notch and superior portion of the condylar neckâ€¦deposition on lingual and resorption on buccal side. Inferior edge of the mandible at the Corpus-Ramus junctionâ€¦â€¦.. Theclinical presence of a deep mandibular antegonial notch is indicative of a diminished mandibular growth potential and a vertically directed mandibular growth pattern. The buccal side can be resorptive or depository depending on the direction of gonial flares. Main sites of post natal growth in the Mandible: Mental foramen is near the lower border at birth. The Condyle Major site of growth with considerable clinical significance. Endochondral growth occurs only at the articular contact part of the condyle. Cartilage is non vascular, hydrophilic and pressure tolerant. This mechanism develops as a response to local demands. Lack action of lateral pterygoid muscle on the same side. Deviation of mandible on oral opening. The condylar neck consists of intramembranous bone. The lingual and buccal sides of the neck have resorptive surfaces. What used to be the condyle becomes the neck by periosteal resorption and endosteal deposition.. Where does the physical force that causes primary displacement of the mandible come fromâ€¦.?? Condylar remodeling acts with displacement as a co participant but not as the driving force in response to common activating signals. As the mandible is displaced away from its basicranial articular contact, the condyle and the ramus secondarily remodel towards it. Growth by counterpart principle PowerPoint Presentation: A remodeling rotation of the ramus alignment occurs. Gonial angle The vertical growth continues even after horizontal has ceased to match the continued vertical growth of the midface. Condylar growth now becomes more vertically directed. The direction of resorption and deposition of the ramus reverses. Periosteal resorption on the labial bony cortex , deposition on the alveolar surface of the labial cortex, resorption on the alveolar surface of the lingual cortex, deposition on the lingual side of the lingual cortex. The transverse and anteroposterior diameters are more than the vertical diameter. Frontal process is well marked Body consists of a little more than the alveolar process The tooth sockets reaching to the floor of orbit Maxillary sinus is a mere furrow on the lateral wall of the nose. Inferior surface of maxilla at birth Anterior surface of maxilla at birth PowerPoint Presentation: Vertical diameter is greatest due to the development of the alveolar process and increase in the size of the sinus. The bone reverts to infantile condition. Its height is a result of absorption of the alveolar process. Ramus to corpus conversion: The two halves of mandible fuse during the first year of life. At birth, the mental foramen,opens below the sockets for the two decidious molar teeth near the lower border. This is because the bone is made up of only the alveolar part with teeth sockets. The mandibular canal runs near the lower border. The foramen and canal gradually shift upwards. Lower jaw of child and adult, showing the mental foramen. In adults The mental foramen opens midway between the upper and lower borders because the alveolar and subalveloar parts of the bone equally developed. The mandibular canal runs parallel with the mylohyoid line. The angle reduces to about or degrees because the ramus becomes almost vertical PowerPoint Presentation: In old age Teeth fall out and alveolar border is absorbed, so that the height of the body is markedly reduced. The mental foramen and the mandibular canal are close to the alveolar bone. The angle again becomes obtuse about degrees because the ramus is oblique. This is a critical time for mid face development Deficient blood supply defects of upper lip and palate. Profitt, 4 th edition Human embryology: Scandinavian University books, Lund K: Pediatric Dentistry ,30 6 , PowerPoint Presentation: The depth of the mandibular antegonial notch as an indicator of mandibular growth potential Am J Orthod Dentofacial Orthop. A dosage-dependent role for Spry2 in growth and patterningduring palate development Ian C. Age changes in Mandible Mandible is relatively small at birth. Eruption of teeth and development of alveolar process contribute to its vertical growth. Assumes a more forward position. With the loss of teeth, alveolar process resorbs reducing the mandibular height. Age changes in Maxilla: Slide from next PowerPoint Presentation: Prenatal Growth Of Maxilla Around the fourth week of intra-uterine life, a prominent bulge appears on the ventral aspect of the embryo corresponding to the developing brain. The floor of the stomodeum is formed by the buccopharyngeal membrane which separates the stomodeum from the foregut Age changes in Mandible: By around 4 th week of intra uterine life, five brachial arches form in the region of future head and neck. The stomatodeum is thus overlapped superiorly by the frontonasal process. The mandibular arches of both the sides form the lateral walls of the stomatodeum. The ectoderm overlying the frontonasal process show bilateral localised thickenings above the stomatodeum. These placodes soon sink and form the nasal pits. The formation of these nasal pits divides the fronto -nasal process into two parts: The medial nasal process The lateral nasal process PowerPoint Presentation: As the maxillary processes undergoes growth, the fronto-nasal processes become narrow so that the two nasal pits come closer.

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Chapter 2 : GROWTH AND DEVELOPMENT MAXILLA AND MANDIBLE - [PPTX Powerpoint]

Growth sites are growth fields that have a special significance in the growth of a particular bone. Eg. Mandibular condyle in the mandible, Maxillary tuberosity in the maxilla. The growth sites may process some intrinsic potential to growth.

These cartilages form the cartilaginous bar of the mandibular arch and are two in number, a right and a left. Their proximal or cranial ends are connected with the ear capsules, and their distal extremities are joined to one another at the symphysis by mesodermal tissue. Between the lingula and the canine tooth the cartilage disappears, while the portion of it below and behind the incisor teeth becomes ossified and incorporated with this part of the mandible. The mandible first appears as a band of dense fibrocellular tissue which lies on the lateral side of the inferior dental and incisive nerves. For each half of the mandible, Slide At the same stage the notch containing the incisive nerve extends ventrally around the mental nerve to form the mental foramen. Also the bony trough grow rapidly forwards towards the middle line where it comes into close relationship with the similar bone of the opposite side, but from which it is separated by connective tissue. A similar spread of ossification in the backward direction produces at first a trough of bone in which lies the inferior dental nerve and much later the mandibular canal is formed. The ossification stops at the site of future lingula. By these processes of growth the original primary center ossification produces the body of the mandible. This point of divergence is marked by the mandibular foramen. Somewhat later, accessory nuclei of cartilage make their appearance: Carrot shaped cartilage appears in the region of the condyle and occupies most of the developing ramus. It is rapidly converted to bone by endochondral ossification 14th. WIU it gives rise to: Condyle head and neck of the mandible. The posterior half of the ramus to the level of inferior dental foramen Slide It is relatively transient growth cartilage center 4th. The anterior half of the ramus to the level of inferior dental foramen Slide These accessory nuclei possess no separate ossific centers, but are invaded by the surrounding membrane bone and undergo absorption. The alveolar process Slide It starts when the deciduous tooth germs reach the early bell stage. The bone of the mandible begins to grow on each side of the tooth germ. By this growth the tooth germs come to be in a trough or groove of bone, which also includes the alveolar nerves and blood vessels. Later on, septa of bone between the adjacent tooth germs develop, keeping each tooth separate in its bony crept. The mandibular canal is separated from the bony crypts by a horizontal plate of bone. The alveolar processes grow at a rapid rate during the periods of tooth eruption. Development of the alveolar process: Due to the increase in the space between the upper and lower jaws why a space created between the opposing teeth to erupt. At the same time bone apposition occurs at the crest of the alveolar prpcess and the fundus of the alveolus. The deposited bone at the fundus of the alveolus counts later to the body of the mandible. This means that bone deposition contributes to the growth of the body of the mandible in height. Subperiosteal bone apposition and bone resorption: Age changes in the mandible Slide At birth The body of the bone is a mere shell, containing the sockets of the two incisor, the canine, and the two deciduous molar teeth, imperfectly partitioned off from one another. The mandibular canal is of large size, and runs near the lower border of the bone; the mental foramen opens beneath the socket of the first deciduous molar tooth. The coronoid process is of comparatively large size, and projects above the level of the condyle. The body becomes elongated in its whole length, but more especially behind the mental foramen, to provide space for the three additional teeth developed in this part. The depth of the body increases owing to increased growth of the alveolar part, to afford room for the roots of the teeth, and by thickening of the subdental portion which enables the jaw to withstand the powerful action of the masticatory muscles; but the alveolar portion is the deeper of the two, and, consequently, the chief part of the body lies above the oblique line. The mandibular canal, after the second dentition, is situated just above the level of the mylohyoid line; and the mental foramen occupies the position usual to it in the adult. The mental foramen opens midway between the upper and lower borders of the bone, and the mandibular canal runs nearly parallel with the mylohyoid line. Old age The bone becomes greatly reduced in size, for with the loss of the teeth the alveolar process is absorbed, and, consequently, the chief part of the bone is below the oblique line. The mandibular canal, with the mental foramen opening from it, is close to the alveolar border. Each bone consists of a body and four processesâ€”zygomatic, frontal, alveolar, and palatine. The Maxilla Slide

Chapter 3 : Growth & Development :PRE & POSTNATAL GROWTH of MAXILLA AND MANDIB.. |authorS

DEVELOPMENT AND GROWTH OF THE MAXILLA Ass. Prof. Dr. Heba Mahmoud Elsabaa 1 Development of The Maxilla (Upper Jaw) Development of the maxilla.

 Abstract Age-related changes of jaws and soft tissue profile are important both for orthodontists and general dentists. Mouth profile is the area which is manipulated during dental treatment. These changes should be planned in accordance with other components of facial profile to achieve ultimate aim of structural balance, functional efficacy, and esthetic harmony. Through this paper, the authors wish to discuss age changes of the hard and soft tissues of human face which would help not only the orthodontists but also oral surgeons, prosthodontists, pedodontists, and general dentists. Introduction Age-related changes of jaws and soft tissue profile are important both for orthodontists and general dentists. Behrents [1] reported that craniofacial growth does not stop in young adulthood but is a continuous process even into later ages. The units of change are small but change in the craniofacial skeleton has become the operational concept rather than termination of the process. The increasing demand for adult orthodontics and orthognathic surgery increases the need to understand the facial aging process. Growth and Profile Change: A Historical Background The physical anthropologists in earlier days worked with dry skull. Keith and Campion [2] studied human facial growth from childhood to adulthood, using immature and mature skulls and 32 living individuals. Hellman [3] made over 45, measurements of external dimensions of the face after studying males and females ranging from 3 to 22 years of age. The findings were presented in the form of superimposed tracings of serial cephalograms made at several stages from 1 month to adulthood. This study is known as Bolton Brush growth study. Behrents [5] did an extensive adult follow-up research of subjects in the original Bolton study, analyzing subjects in the age range of 17 to 83 years. He concluded that craniofacial size and shape changes continue past 17 years to the oldest ages studied. He summarized that significant sexual dimorphism existed: On the other hand, women showed periods of increased rates of craniofacial growth, apparently related to the time of pregnancies. Child Face The child has a high intellectual-like forehead without coarse eyebrow ridges, with prominent cheekbones, large and wide-set eyes, and a flat face. It has a short nose, low nasal bridge, and a concave nasal profile. The face is vertically short because of small nasal part, still growing jaw bones and not yet established primary and secondary dentition. In a profile view, the most striking feature is lower jaw which is far retrusive than the face above. The general tendency seems to be for the mandible to grow from the more retruded to a less retruded position and this is usually true regardless of the individual facial type. The maxilla tends to be positioned in a forward direction much more slowly than does the mandible, resulting in a decrease in the convexity of the facial profile. This differential growth in an anterior direction determines the final facial type at the completion of growth [6]. Why Is There a Change in Profile? There is an axis of increased growth extending from head towards the feet. This increased gradient of growth is evident even within the face. The cranium is proportionally larger than face during birth but, postnatally, face grows more than cranium. Similarly, the mandible grows more in amount and for longer duration than maxilla [7]. In a child, nasal part of the face is underdeveloped because of overall small body and lung size at that stage. Correspondingly, respiratory function has low demands. The nasal part of the face and the pharyngeal space has to enlarge in response to increased demands on respiratory function imparted by increasing overall body and lung size. For the nasomaxillary space to enlarge, nasomaxillary complex has to grow out from beneath the anterior cranial base. Then both the jaws have to grow to accommodate erupting deciduous and subsequently permanent dentition and enlarging muscles of mastication. These factors impart a vertical height and a depth to the face [6]. Hard Tissue Profile Changes 5. Forehead The neurocranium grows earlier faster and to a much greater extent than facial complex. This region seems very large and high because the face beneath it is still relatively small. But in the following years the face enlarges much more so that the proportionate size of the forehead becomes reduced. Pneumatization of the frontal sinus is responsible for the supraorbital ridges becoming prominent and forehead becoming much more sloping [6]. Nasal Bone The young child has small rounded nose that protrudes very little and is vertically quite short. The nasal bridge is quite low with the lateral bony wall of the nose being characteristically narrow and shallow. The whole nasal region of the infant is vertically shallow and the nasal floor lies close to the inferior orbital rim. The shape of the nasal bridge changes from concave to convex [6]. Longitudinal studies on postpubertal growth are limited. Slightly smaller jaw length increases were noted by Sarnas and Solow [9] between 21 and 26 years, Bishara et al. Postpubertal craniofacial skeletal and dental changes were examined from lateral cephalograms of Class I males taken when subjects were 16, 18, and 20 years of age by Love et al. Mandibular growth was found to be statistically significant for the age periods of 16 to 18 years and 18 to 20 years. Growth from 16 to 18 years was greater than that from 18 to 20 years. Maxillary and mandibular growths were highly correlated at each age period. However, overall mandibular growth was approximately twice that of overall maxillary growth. Mandibular growth was found to involve an upward and forward rotation, a result of posterior vertical growth exceeding anterior vertical growth. Lower incisors were found to tip lingually with increasing age. Foley and Mamandras [15] determined the magnitude and the direction of postpubertal mandibular and maxillary facial growth in females. The sample consisted of 37 untreated subjects who had Class I skeletal and dental characteristics and whose lateral cephalograms were taken at 14, 16, and 20 years of age. Mandibular growth was determined to be significant for the age periods of 14 to 16 years and 16 to 20 years. Overall mandibular growth was approximately twice that of the overall maxillary growth. The mandibular growth rate was found to be twice as large for age period 14 to 16 years as for age period 16 to 20 years. The increase in posterior vertical face height was slightly more than the increase in anterior vertical face height. The mandibular plane angle decreased 1. Mandibular incisors appeared to tip labially with advancing age. Although variable, the potential for significant maxillary and mandibular facial growth in females during late adolescence has been demonstrated. Premaxilla The anterior outline of the bony maxillary arch in the infant has a vertically convex topography. This is in contrast to the characteristic concavity this region develops in the adulthood. The alveolar bone in this area of the adult face is noticeably protrusive. Anterior contour of premaxilla is flat in infants; the differential remodeling process draws out this contour [6]. On the other hand, intermolar width increases by 2 mm between 3 and 5 yrs and by 2. There is a slight decrease in arch length with age because of uprighting of the incisors. Kanekawa and Shimizu [17] in a study on age-related changes on bone regeneration in midpalatal suture during maxillary expansion in the rat suggested difficulty of rapid palatal expansion in 52 w rats. Furthermore, age-related decrease in bone regeneration after expansion of the suture within 24 w rats may not be caused by decrease in bone matrix formation but decrease in mineralization of bone matrix. Therefore, the midpalatal suture can be expanded in the cases matured beyond pubertal growth, but more time may be necessary to regenerate mineralized bone in the suture. In mandibular arch, intercanine width increases between 3 and 13 yrs by 3. Intermolar width increases by 1. There is a slight decrease in arch length with age because of uprighting of the incisors and loss of leeway space by the mesial movement of the first permanent molars [16]. Mandibular intercanine width, on the average, is established by 8 years of age, that is, after the eruption of the four incisors. After the eruption of the permanent dentition, the clinician should either expect no changes or a slight decrease in arch widths [16]. A longitudinal study of arch size and form in untreated adults was performed by Harris et al. Arch lengths measured in a pure longitudinal series of untreated adults, at about 20 and again at about 55 years of age, decreased significantly with time. This was a normal, predictable function of aging. Arch widths increased, with little change across the canines, but appreciably more in the more distal regions of each arch. Anterior Facial Height The increase in anterior face height is probably largely due to continued tooth eruption. Sarnas and Solow [9] and Forsberg [19] suggested that the major part of the anterior face height increase in the third decade takes place in the first half of the decade. However, Bondevik [11] who reported a 1. Apparently, anterior face height increase continues well into the fourth decade. Posterior Facial Height In males, the posterior facial height increases by almost as much as the anterior face height. In females, the posterior face height does not increase significantly in contrast to the anterior face height. However, Bishara et al. Chin The chin is incompletely formed in the infant. The mandible of the young child is quite small and retrusive relative to the upper jaw. The anterior cranial fossa is developmentally precocious. Hence, the nasomaxillary complex is carried to a more protrusive position. The mandible, which articulates on the middle cranial fossae, is located more posteriorly. With continuing growth, the chin tends to assume forward position relative to the superior aspects of the skeletal face and the mandible grows from the more retruded to a less retruded position [6]. Components of Soft Tissue Profile 6. Nose The soft tissue nose is short, rounded, and pug-like. The nasal bridge is low; the nasal profile is concave and the nares can be seen in a face on view. It protrudes very little and is vertically quite short [6].

Chapter 4 : Growth Of Maxilla & Mandible :) by Khadiga Elghawas on Prezi

CONCLUSIONCONCLUSION Since the growth of maxilla and mandible hasSince the growth of maxilla and mandible has a great influence on the diagnosis, prognosisa great influence on the diagnosis, prognosis and treatment of growth discrepancies inand treatment of growth discrepancies in children, so a thorough knowledge is requiredchildren, so a.

Sometimes it articulates with the orbital surface, and sometimes with the lateral pterygoid plate of the sphenoid. Anterior surface of maxilla at birth. Inferior surface of maxilla at birth. The maxilla is ossified in membrane. Mall and Fawcett maintain that it is ossified from two centers only, one for the maxilla proper and one for the premaxilla. Mall states that the frontal process is developed from both centers. The maxillary sinus appears as a shallow groove on the nasal surface of the bone about the fourth month of development, but does not reach its full size until after the second dentition. The maxilla was formerly described as ossifying from six centers, viz. Changes by age[edit] At birth the transverse and antero-posterior diameters of the bone are each greater than the vertical. The frontal process is well-marked and the body of the bone consists of little more than the alveolar process, the teeth sockets reaching almost to the floor of the orbit. The maxillary sinus presents the appearance of a furrow on the lateral wall of the nose. In the adult the vertical diameter is the greatest, owing to the development of the alveolar process and the increase in size of the sinus. Each maxilla attaches laterally to the zygomatic bones cheek bones. Each maxilla assists in forming the boundaries of three cavities: A maxilla fracture is often the result of facial trauma such as violence , falls or automobile accidents. Maxilla fractures are classified according to the Le Fort classification. In other animals[edit] Sometimes e. Conversely, in birds the upper jaw is often called "upper mandible". In most vertebrates, the foremost part of the upper jaw, to which the incisors are attached in mammals consists of a separate pair of bones, the premaxillae. These fuse with the maxilla proper to form the bone found in humans, and some other mammals. In bony fish , amphibians , and reptiles , both maxilla and premaxilla are relatively plate-like bones, forming only the sides of the upper jaw, and part of the face, with the premaxilla also forming the lower boundary of the nostrils. However, in mammals, the bones have curved inward, creating the palatine process and thereby also forming part of the roof of the mouth. Cartilaginous fish , such as sharks, also lack a true maxilla. Their upper jaw is instead formed from a cartilaginous bar that is not homologous with the bone found in other vertebrates.

Chapter 5 : Age Changes of Jaws and Soft Tissue Profile

POST NATAL DEVLOPMENT OF MAXILLA AND MANDIBLE Presented by: MUDIT KUMAR (29) Some definitions related to Growth - The self multiplication of living substance - JX Huxely..

Chin development as a result of differential jaw growth Introduction During facial growth, the maxilla and mandible translate downward and forward. Although the forward displacement of the maxilla is less than that of the mandible, the interarch relationship of the teeth in the sagittal view during growth remains essentially unchanged. Interdigitation is thought to provide a compensatory tooth movement mechanism for maintaining the pattern of occlusion during growth: The purpose of this study was to investigate the hypothesis that the human chin develops as a result of this process. Measurements of growth T2 minus T1 parallel to the Frankfort horizontal FH for the maxilla, maxillary dentition, mandible, mandibular dentition, and pogonion Pg were made. Results Relative to Pg a stable bony landmark , B-point moved posteriorly, on average 2. Similarly, the mandibular and maxillary incisors moved posteriorly relative to Pg 2. A-point, relative to Pg, moved posteriorly 4. Conclusions Bony chin development during facial growth occurs, in part, from differential jaw growth and compensatory dentoalveolar movements. The chin, or more specifically the protuberance of the bony mandibular landmark, the mentum osseum, is a facial feature unique to modern humans. Humans differ in the forward projection of the mentum osseum compared with higher primates and other species of Homo who lack a similar prominence of this mandibular landmark. Why is this so? The development of the chin in modern humans has largely been viewed in the literature as an evolutionary change in mandibular architecture brought about by altered function and biomechanical forces as the mandible diminished in size. Recent studies, however, have documented that the formation of the human chin cannot be explained entirely as a function of biomechanics. In contrast to a purely biomechanical explanation, other studies have suggested that modern human chin morphology is the result of a posterior displacement of the mandibular dentition relative to the basal region of the mandible, and the evolution of the human chin is the result of a relative independence of the alveolar and basilar regions of the mandible. It is well established that during facial growth the anterior aspect of the mandibular alveolus at the symphysis is resorptive, while the lower symphyseal border, near Pg, is developmentally stable and exhibits little to no remodeling. As such, formation of the human chin is not the result of bony deposition along its anterior surface. Their data suggest that the prominence of the chin results from the posterior placement of the mandibular incisors relative to the chin rather than from an increase in the relative size of the chin at Pg. The posterior migration of the mandibular dentition is developmentally linked to the differential growth of the mandible and maxilla. This was originally suggested by Lager. Similarly, while the mandibular dentition moved anteriorly relative to the maxillary basal bone, it migrated posteriorly relative to the mandibular basal bone. The posterior position of the mandibular dentition relative to the basal bone of the mandible is likely due to the interdigitation and function of the mandibular and maxillary dentition in promoting maintenance of the occlusal pattern. As the mandible outgrows the maxilla, the mandibular dentition is, in effect, dragged relatively posterior by the maxilla. The purpose of this study was to assess the longitudinal development of the chin as a function of differential jaw growth and spatial positioning of the mandible, the maxilla, and the dentition. We did this by testing 2 specific hypotheses in a longitudinal sample of untreated subjects. The horizontal projection of the chin is a function of differential anterior growth between the mandibular body and the mandibular dentition and its associated alveolar bone; that is, the chin develops as the mandibular dentition exhibits posterior displacement relative to mandibular basilar bone during jaw growth. Changes in the anterior-posterior position of the mandibular dentition during growth and development follow concomitant changes in the maxillary dentition as a function of maxillary growth relative to the mandible. As such, variation in the position of the mandibular dentition during growth should follow that of the maxilla. Material and methods To test our hypotheses, material was obtained from the Iowa Facial Growth Study. This pure longitudinal study began with whites 92 males and 91 females. Included in this study are lateral and anterior-posterior cephalograms, as well as intraoral models, taken every 6 months between the ages of 5 and 12 years and annually thereafter through age 18 years. A final set of records was taken at adulthood. All subjects had a normal angle Class I molar and canine relationship and were free of any facial or skeletal disharmony. Subject participation in the growth study diminished with age, leaving participants at age 12 years and 70 participants in early adulthood. A subset of 25 subjects 13 males and 12 females who had never received orthodontic treatment or extractions of permanent teeth third molars excluded were randomly selected based on the availability of lateral cephalograms with sufficient image quality in the regions of interest at the ages studied. Table I provides descriptive statistics and selected skeletal cephalometric relationships for our sample. Although these subjects had normal Class I occlusion during growth, they did exhibit considerable variation in skeletal cephalometric measurements.

Chapter 6 : Chin development as a result of differential jaw growth | Pocket Dentistry

calendrierdelascience.com process also responsible for the distance between the mandibular canal and the apices of the premolars and first two molars. â€¢ This means that bone deposition contributes to the growth of the body of the.

The two maxillae form the whole of upper jaw, and each maxilla enters into the formation of face, nose, mouth, orbit, the infratemporal fossa and ptyerygopalatine fossae. It has a body and four process, the frontal, zygomatic, alveolar and palatine. It develops from the first pharyngeal arch. It has a horse - shoe body which lodges the teeth, and a pair of rami which projects upwards from the posterior ends of the body and provide attachments to muscles. The floor of stomodeum is formed by the buccopharyngeal membrane which seperates it from the foregut. By around the 4th week of intra-uterine life, 5 branchial arches form in the region of the future head and neck. Each of these arches give rise to muscles, connective tissue, vasculature, skeletal components and neural components of the future face. The mesoderm covering the developing forebrain proliferates and forms a downward projection that overlaps the upper part of stomadeum. The mandibular arches of both sides form the lateral walls of the stomadeum. The ectoderm overlying the fronto-nasal process shows bilateral localized thickenings above the stomodeum. The formation of these nasal pits divides the frontonasall process into 2 parts: Medial nasal process b. As the maxillary process undergoes growth, the frontonasal process becomes narrow so that the 2 nasal pits come closer. The line of fusion of maxillary process and the medial nasal process corresponds to the naso-lacrimal duct. These bulges are seperated by the primitive oral cavity or stomodeum. The pharyngeal arches are laid down on lateral and ventral aspects of the cranialmost part of the foregut which lies in close approximation with the stomodeum. Initially, there are 6 pharyngeal arches, but the one usually disappears as soon as it is formed leaving only five. They are seperated by 4 branchial grooves. Each of these arches contain: A central cartilage rod that forms the skeleton of the arch. A muscular component called branchiomere. It extends from the cartilaginous otic capsule to the midline or symphysis and provides a template for guiding the growth of the mandible. A major portion of this cartilage disappears during growth and the remaining part develops into following structures: The mental ossicles Incus and malleus Spine of sphenoid bone. Anterior ligament of malleus Spheno - mandibular ligament 17 The first one to develop in the primordium of the lower jaw is the mandibular division of trigeminal nerve. This is followed by the mesenchymal condensation forming the 1st branchial arch. Maxillary process Palatal shelves given off by the maxillary process. As the palatal shelves grow medially, their union is prevented by the presence of the tongue. Thus, initially the developing palatal shelves grow vertically downwards the floor of mouth. They change from vertical to a horizontal position. Alteration in biochemical and physical consistency of the connective tissue of the palatal shelves. Alteration in vasculature and blood supply to the palatal shelves. Appearance of an intrinsic shelf force. Rapid differential mitotic activity. Stage 1 21 Stage 2 Stage 3 22 Face and the palate Stage 4 Primitive palate of a human embryo of thirty-seven to thirty-eight days. Stage 5 23 The mouth cavity. The cheeks have been slit transversely and the tongue pulled forward. Thus, the growth of the cranial base has a direct bearing on the naso - maxillary growth. The passive displacement of the maxilla is an important growth mechanism during primary dentition years but becomes less important as growth of cranial base slows. Superior orbital fissure 2. Inferior orbital fissure 3. Zygomatico frontal suture 9. Orbital plate of the ethmoid bone 27 sutures seen on the lateral aspect of the skull. The ramus moves progressively posterior by a combination of deposition and resorption. Resorption occurs in the anterior part of ramus while bone deposition occurs on the posterior region. Additional space is available by means of resorption of the anterior border of ramus is made use of to accommodate the erupting permanent molars. This results in flaring of the angle of the mandible as age advances. It forms the boundary between the ramus and the body. It moves posteriorly by deposition on its posteriorly facing surface. The prominence of the tuberosity is increased by the presence of large resorption field just below it. Thus, it produces a lingual fossa. As the teeth develops and increases in height by bone deposition at the margins. It adds to the height and thickness of the body of the mandible and is particularly manifested as a ledge extending lingual to the ramus to accommodate the 3rd molars. It has been recognized as the important site of growth. The head of the condyle is covered by a thin layer of cartilage called the condylar cartilage. The presence of this is an adaptation to withstand the compression that occurs at the joint. There are 2 school of thoughts regarding its growth. It was earlier believed that growth occurs at the surface of the condylar cartilage by means of bone deposition and the condyle grows towards the cranial base. As the cranial base pushed against the cranial base, the entire mandible gets displaced forwards and downwards. Bone growth follows secondarily at the condyle to maintain constant with the cranial base. The growth ceases around 20 years of age. Briefly it has a propeller- like twist, so that its lingual side faces 3 general directions all at once, i. The transverse and anteroposterior diameters are more than the vertical diameter. Frontal process is well marked. Body consists of a little more than the alveolar process, the tooth sockets reaching to the floor of orbit. Maxillary sinus is a mere furrow on the lateral wall of the nose. Inferior surface of maxilla at birth. Anterior surface of maxilla at birth. Vertical diameter is greatest due to the development of the alveolar process and increase in the size of the sinus. The bone reverts to infantile condition. Its height is a result of absorption of the alveolar process. At birth the mental foramen, opens below the sockets for the two deciduous molar teeth near the lower border. This is because the bone is made up of only of the alveolar part with teeth sockets. The mandibular canal runs near the lower border. The foramen and canal gradually shift upwards. Lower jaw of child and adult, showing the mental foramen. The mandibular canal runs parallel with the mylohyoid line. The mental foramen and the mandibular canal are close to the alveolar bone. The angle again becomes obtuse about degrees because the ramus is oblique.

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Chapter 7 : Maxilla - Wikipedia

Growth and development PRE-NATAL & POST-NATAL GROWTH OF MAXILLA AND MANDIBLE Wingdings: Contents 1)Pre Natal development of Maxilla Embryonic development Meckel's cartilage Development of palate Mech' of palate elevation Palate remodelling 2)Post Natal development of Maxilla Displacement Remodelling Growth at sutures Growth in height,wifth.

Terminology Related To Growth: Growth sites are growth fields that have a special significance in the growth of a particular bone. Mandibular condyle in the mandible, Maxillary tuberosity in the maxilla. The growth sites may process some intrinsic potential to growth. Growth centers are special growth sites , which control the overall growth of the bone. Epiphyseal plates of long bone. Displacement can be of two types. Characteristics of Bone Growth Bone formation occurs by 2 methods of differentiation of mesenchymal tissues that may be of mesodermal or ectomesenchymal origin. Accordingly 2 types of bone growth is normally seen. The transformation of mesenchymal connective tissue usually in membranous sheets,into osseous tissues. The conversion of hyaline cartilage prototype models into bone. Hence, while discussing the growth of nasomaxillary complex, we have to look into three aspects. This occurs by growth of the maxillary tuberosity in a posterior direction. This results in the whole maxilla being carried anteriorly. Appositional growth occurs on posterior border of the ramus and on the alveolar process. Principle sites of growth in mandible 1. As the growth proceeds, the posterior surface may become the anterior as the remodelling continues. In infancy the ramus is located at a spot where the primary first molar will erupt. Progressive posterior remodelling thus creates space for the second primary molar and the sequentially for the permanent first molar. More often than not this growth ceases before enough space has been created for the eruption of third permanent molar which becomes impacted. The mandible consists of three functional processes: Alveolar process Muscular process Condylar process In these studies, implants are placed in stable areas away from functional processes and significant jaw rotation in the core can be observed.

Chapter 8 : Prenatal & Postnatal Growth of Mandible - [PPT Powerpoint]

The abundance of cancellous bone present indicates this is the region of rapid calendrierdelascience.com different directions of the spicules and vessels, seemingly coor- dinated, indicate the different directions of growth and development of the mandible.

Chapter 9 : Mandible Development |authorSTREAM

Growth Of Maxilla & Mandible:) POST NATAL GROWTH OF MANDIBLE Growth in width is completed 1st then growth in length and finally growth in height (W>L>H).