Comparing the Face Height Changes in Dentulous and Edentulous Patients by Cephalograms

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Abstract: Three Hundred Patients were selected for this study free from any systemic disease. Patients were classified into three groups the first group patients was resaved complete dentures with acrylic tooth, second group patients was resaved complete dentures with porclin tooth and third group compete dentulous patients. Cephalograms were done for each patient as a method of evaluation of changes occurred in vertical face height changes in dentulous and edentulous patients by cephalograms. Records were done at time, after After 6, 12, 18, 24 and 30 months. Measurements were taken at different fixed points to record change in vertical face height.

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1. Introduction:

The exact measurement of the natural vertical dimension is most essential in the successful practice of many phases in dentistry; Determination of occlusalstraight up dimension is one of the essential steps in making dentures (1). Vertical jaw relation is the length of the face as specified by the extent of split-up of the jaws; it can also be well-defined as the extent of separation between maxilla and mandible in a frontal plane. To make a fruitful denture, the establishment of correct vertical dimension(2). Head and cervical stance assessment has been a sympathy toward numerous years, not just in view of the indicated relationship that exists in the middle of head and cervical stance in the vicinity of temporomandibular issue, neck agony and migraine, additionally in light of the biomechanical relationship between the head and cervical spine and dentofacial structures. Numerous routines have been recommended trying to build up the most ideal approach to assess the position of the head utilizing teleradiographs and cephalometric analysis.(3)

Albeit facial extents, points, and shapes fluctuate with age, sex, and race. It is advantageous to consider tasteful "standards" when examining the face preoperatively and arranging. The surface markings of the face, delicate tissue cephalometric focuses for introduction, and normally depicted facial planes and points. Facial extents, estimations, and points that are regarded "perfect" are delineated to encourage the specialist with facial examination and add a quantifiable measurement to perioperative appraisal in surgical facial revival (4,5).

Several soft-tissue cephalometric topics are characterized along the midsagittal plane from the glabella high-handedly to the cervical topic (6). These milestone points are utilized to depict facial extents and angles. The outside nose is pyramidal fit as a fiddle with its base sitting over the nasal opening of the skull. The base of the nose lies second rate compared to the glabella in the midline, over the frontonasal suture. The nose extends anteriorly and poorly from the nasion, or most profound part at the root, to the tip, or apex (7). The dorsum be part of the craniometric point to the height and is bolstered by stable osnasale superiorly and transportable ligament poorly.

The largest a part of the nose contains of the nostrils, that connected into the nasal vestibule (8). Centrally, the tower connections the best of the nose to the philtrum of the connective tissue superior lip. The affiliation between the red parts of the lips with the skin is that the cinnabar border. Directly neighboring the cinnabar peripheral is that the white passage, a tube like structure that goes the length of the lip. within the sheet, the higher lip expands anteriorly because the tubercle. beneath the lower lip, the labiomental depression goes between the lip and therefore the button (9).

Between the alae of the nose and the parallel border of the lip, the nasolabial furrow or fold isolates the upper lip from the cheek. The delicate tissue of the upper sidelong cheek extends anteriorly over the zygomatic curve and

speaks to a highlight of excellence in many societies (10).

Vertical jaw relation is the interval of the face as measured by the extent of split-up of the jaws; it can also be defined as the amount of separation between maxilla and mandible in a frontal plane. To make a successful denture, the establishment of correct vertical dimension is generally agreed to be one of the most important step in denture construction from standpoint of function, esthetic and phonetics.Various techniques were used to determine vertical dimension of occlusion like maximum biting force, swallowing method, functional factor of phonetics with pronouncing f,v and s, cephalometric radiograph, lip length and amount of coverage of the maxillary central incisor (11,12). Cephalometric was analyzed inside of the craniofacial perplexing, remaining edge resorption, and position of the dentures. The changes were related with the some variables including: age, sex, skeletal pattern, edentulous years, technique of denture fabrication, and nighttime use of the dentures. Resultsfrom this study suggest that the maxillae and the mandible presented sagittal spatial left-handed displacement. Comprehensive dentures exhibit a left-handedspin and onward movement. Soft tissue seat is more significant than alveolar ridge resorption in the positional deviations of complete dentures. Bonydamage a normal portion of aging that influences the maxilla and mandible (13).

2. Materials and methods:

Three hundred Patients were selected for this study free from any systemic disease, age Range for edentoulous patients from 40 to70 Y and dentulous patients from 20 to 30Y. Patients were classified into three groups the first group was resaved complete dentures with artificial acrylic tooth, the second group was resaved complete dentures with artificial porcine tooth and third group compete dentulous patient. Complete dentures were constructed for them (first and second groups). At the time of delivery. Small cavity in the fitting surface at the midline of upper and lower dentures was prepared using size one fissure bur. Amalgam was condensed in these cavities and burnishing of amalgam to flush the fitting denture surface was done. Insertion and adjustment of dentures in patient mouth done. Cephalometricra diographes were taken for the three groups while patients were closing in centric occlusion at time of delivery, six months, twelve months, eighty month, twenty four months and third month follow-up periods. Measurements were taken at different fixed points to record change in vertical face height.

Tracing of these cephalograms was carried out.

Measurements on these traced cephalograms were done at certain points in the following manner:- Vertical line (I) was drawn parallel to the metal rod of the cephalometricradiogragh and tangent to the frontal skull bone and symphysismenti bone Horizontal line (A) was drawn crossing line (I) at point (F) and the base of the upper amalgam dot Horizontal line (B) was drawn crossing line (I) at point (G) and the top of the lower amalgam dot and parallel line (A). Horizontal line (C) was drawn crossing line (I) at point (E)and crossing the nasion (N). Horizontal line (D) was drawn crossing line (I) at point (H) and crossing the menton (M). Measurements were taken in the following manner:- Distance A-B denoting changes due to wear of acrylic resin teeth. Distance A-c denoting changes due to settling of upper dentures and bone resorption of the upper arch. Distance B-D denoting changes due to settling of lower dentures and bone resorption of the lower arch. Distance C-D denoting total changes in facial height due to the three processes setting, bone resorption and wear of acrylic resin teeth. In the third group compete dentulous patients. Measurements were taken as the same edentulous groups except into Horizontal line (A) was drawn crossing line (I) at point (F) and the high point of the alveolar bone between the upper two central incisor and Horizontal line (B) was drawn crossing line (I) at point (G) and the top of the alveolar bone between lower two central incisor and parallel line (A).Collected data were tabulated and statistically analyzed. Cephalometrics is the explanation of lateral skull radiographs obtainedwithidentical conditions. The patient is located in a Cephalostat. This situation the patient with their head concerned at 90^{o} to the X-Ray at a length of 5ft from the tube. This is a standardwith which all cephalometric radiographs are obtainedover the world. It guarantees that radiographs obtained at various centers are directly equivalent. The film is then found and various standard milestones, lines and angles are calculated and documented. This permits comparison to the normal values for people and evaluation of growth and/or special effects of treatment. In this reality, a set of

analysis were used which is widely used in orthodontics and known as 'Eastman Analysis'.

3. Results:

From Tab (1) and fig(1) show the means the different changes in the vertical face height at different periods for the first group. There was no significant different in mean of A-B distance from delivery until six months at 12,18,24 and 30months significant different decrease by time. In the A-C (bone resorption in upper arch) there was no significant different at delivery, 6m, and 12m while at 18m, 24m, and 30m significant different decrease by time. In B-D (bone resorption in lower arch) there was no significant different at delivery, 6m, and 12m, 18m, and 24 m there was significant different decrease by time in30m. In C-D (total change in face height) there was no significant different at delivery, and 6month while in 12m, 18m, 24m, and 30m significant different decrease by time.

From Tab (2) and fig(2) show the means the different changes in the vertical face height at different periods for the second group. There was no significant different in mean of A-B distance from delivery, six months, 12months, 18 month,and24 month. While 30month significant different lower decrease by time. In the A-C (bone resorption in upper arch) there was no significant different at delivery, 6m, and 12m and18m, while in 24m, and 30m significant different decrease by time. In B-D (bone resorption in lower arch) there was no significant different at delivery, 6m, and 12m,18m,and 24 m there was significant different decrease by time in30m.In C- D (total change in face height) there was no significant different at delivery, 6m,12m,and18m. While in 24m, and 30m significant different decrease by time.

Tab(1)the mean, standard deviation and p value the different changes in the vertical face height at different periods for the first group.

Distance	At delivery			After 6 months			After 12 months			After 18 months			After 24 months			After 30 months		
	Mean	**SD**	***p-value***	**Mean**	**SD**	***p-value***	**Mean**	**SD**	***p-value***	**Mean**	**SD**	***p-value***	**Mean**	**SD**	***p-value***	**Mean**	**SD**	***p-value***
A-B (acrylic tooth wear)	2	0.9	0.5	2	0.9	0.5	1.85	.85	0.45	1.7	0.8	0.4	1.6	0.7	0.4	1.3	0.6	0.3
A-C (bone resorption in upp. arch)	7	0.9	0.5	7	0.9	0.5	7	0.9	0.5	6.8	0.9	0.5	6.6	0.9	0.4	6.3	.83	0.4
B-D (bone resorption in lower arch)	5	0.9	0.55	5	0.98	0.55	5	.98	0.55	5	.98	0.5	5	.98	.55	4.9	.96	0.5
C-D (total change in face height)	11	0.8	0.5	11	0.85	0.5	10.9	.84	.49	10	.83	0.5	10	.81	.46	10	.79	.42

S.D=standard deviation; Significant different at ($p<0.05$)

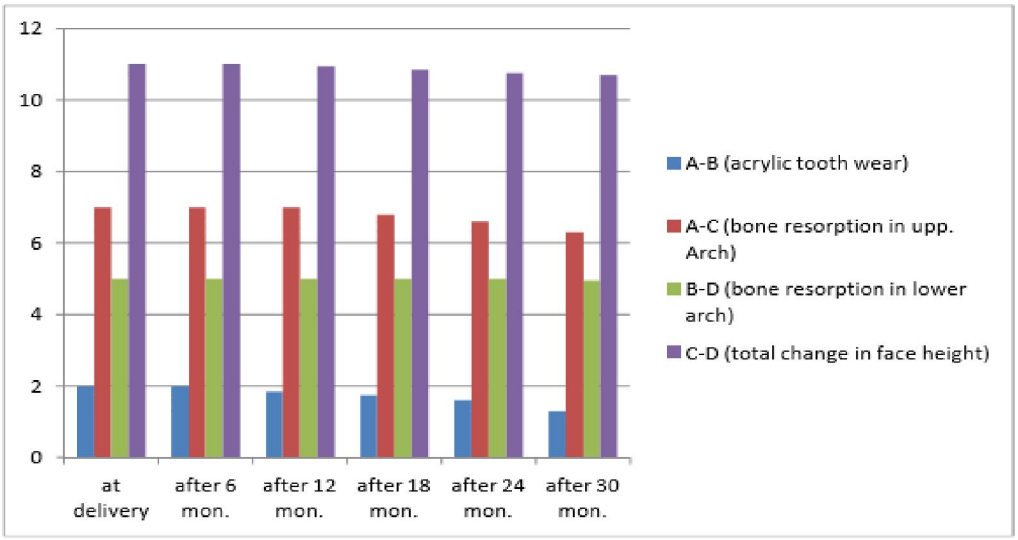

Fig (1): The mean of the different changes in the vertical face height at different periods for the first group.

Table (2): The mean, standard deviation and P value the different changes in the vertical face height at different periods for the second group.

Distance	At delivery			After 6 months			After 12 months			After 18 months			After 24 months			After 30 months		
	Mean	SD	*p-value*	Mean	SD	*p-value*	Mean	SD	*p-value*	Mean	SD	*p-value*	Mean	SD	*p-value*	Mean	SD	*p-value*
A-B (porclain tooth wear)	3	0.9	.5	3	0.9	0.5	3	0.9	0.5	3	.9	0.5	3	.9	0.5	2.9	.88	.48
A-C (bone resorption in upp. arch)	7	9.5	0.5	7	.9	0.5	7	.9	0.5	7	.9	0.5	6.9	.89	0.5	6.8	.87	.46
B-D (bone resorption in lower arch)	6	.98	0.55	6	.98	0.5	6	.98	0.55	6	.98	0.5	6	.98	.55	5.9	.96	.54
C-D (total change in face height)	11	.85	.5	11	.85	.5	11	.85	.5	11	.85	0.5	10.9	0.8	.49	10.9	.83	.48

S.D=standard deviation; Significant different at ($p<0.05$)

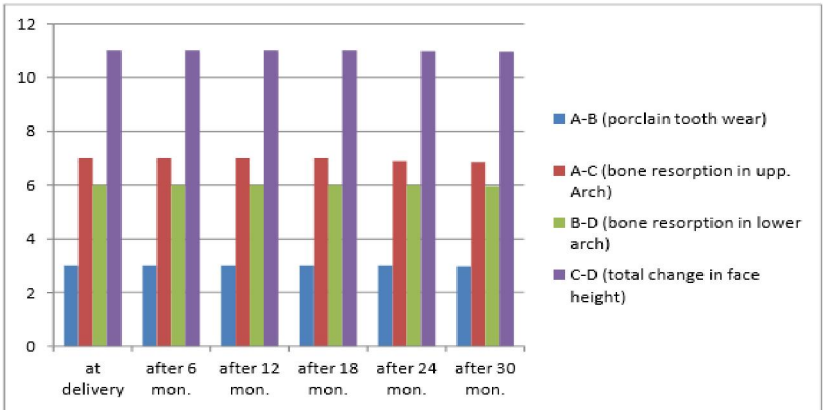

Fig (2): the mean of the different changes in the vertical face height at different periods for the second group.

Table (3): The mean, standard deviation and p value the different changes in the vertical face height at different periods for the third group.

Distance	At x-ray			After 6 months			After 12 months			After 18 months			After 24 months			After 30 months		
	Mean	SD	*P*-value	Mean	SD	*P* -value	Mean	SD	*P* -value	Mean	SD	*P* -value	Mean	SD	*P* -value	Mean	SD	*P* -value
A-B (natural tooth wear)	5	.9	.4	5	.9	.4	5	.9	.4	5	.9	.4	5.1	.92	.42	5.15	.93	.43
A-C (bone deposition in upp. arch)	7	.94	.45	7	.94	.45	7	.94	.45	7	.94	.45	7	.94	.45	7.1	.95	.46
B-D (bone deposition in lower arch)	6	.96	.4	6	.96	.4	6	.96	.4	6	.96	.4	6	.96	.4	6	.96	.4
C-D (total change in face height)	12	.95	.42	12	,95	.42	12	,95	.42	12	.95	.42	12.2	.96	.43	12.3	.97	.44

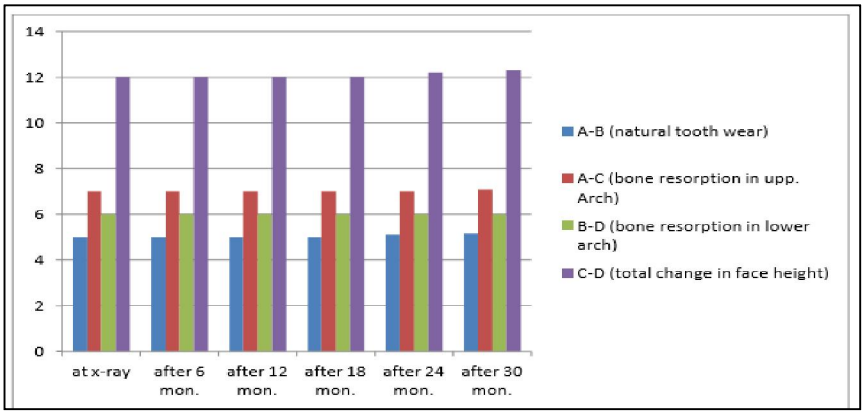

Fig (3): The mean, standard deviation and p value the different changes in the vertical face height at different periods for the third group.

3. Results summary:

From Tab (3) and fig (3) show the means the different changes in the vertical face height at different periods for the third group. There was no significant different in mean of A-B distance at taken x ray, six, 12, and 18 months. While in 24m, and 30 months significant different slightly increase by time. In the A-C (bone deposition in upper arch) there was no significant different at taken x ray, 6m, 12m,18m and 24m, while in 30m significant different minimal increase. In B-D (bone deposition in lower arch) there was no significant different at taken x ray, 6m, and 12m, 18m, and 24 m there was significant different minimal increase by time in30m.In C-D (total change in face height) there was no significant different at taken x ray, 6m, 12m, and 18m, while in 24m, and 30m significant different minimal increase by time.

4. Discussion:

Tuncay, et al found that record changes inside of the craniofacial intricate, remaining edge resorption, and position of the dentures. The changes were associated with the some variables including age, sex, skeletal example, edentulous years, strategy of denture fabrication, and evening time wear of the dentures. Resultsof this study supposethat the maxillae and the mandible indicated sagittal spatial counterclockwise dislodging. Complete dentures display a counterclockwise pivot and forward development. Delicate tissue seating is more vital than alveolar edge resorption in the positional changes of complete dentures. Variety in denture methods had no impact on the watched changes. Manufactured porcelain teeth did not demonstrate a quantifiable measure of wearing down amid the 10-year perception period. Watched changes were not fundamentally influenced by variables, for example, sex, years' edentulous, evening time wear, or skeletal example. Two exemptions were that the skeletal example influences prognathism and number of years edentulous influences mandibular edge resorption(13).

Bissasu, mentioned that It is frequently possible to see the patient before he or she becomes edentulous, in such cases, one can usually establish the occlusal position, record it in some manner and transfer this record to the edentulous situation.The use of pre-extraction records is quite helpful in determining and establishing the vertical dimension of occlusion in edentulous patients Pre-extraction measurements from the incisal edges of lower anterior teeth to the anterior attachment of lingual frenum and depth of mucolingual reflection have been suggested as means of establishing vertical dimension for complete denture fabrication (14). Fayz, measured the distance from the depth of the mucolabialreflectin of the lower lip to the tip of the mandibular incisors and canines. The average distance was calculated to be 16.54 mm in the mandibular region(15). Farkas et al mentioned that the face is divided into horizontal thirds. The third stretches out from the hairline to the glabella, the center third from the glabella to the subnasale, and the lower third from the subnasale to the menton. These facial thirds are approximatelyequal. In Caucasians, the center third is regularly lower than the upper third and the center and upper thirds are lowerthan the lower third (16). Sim RST mentioned that In East Asians, the center third of the face is frequently more prominent than the upper third and equivalent to the lower third, and the upper third is lowerthan the lower third. The lower third is further partitioned into its own thirds, characterizing the upper lip, lower lip, and jaw (17).

Anic-Milosevic et al. compared the extents of the lower facial third sections in males and females. The chin denotes the biggest portion and the lower lip height the littlest in both genders. In spite of the fact that the vermilion height of upper and lower lips did not vary in the middle of men and women, the upper and lower lip statures were bigger in males. In both sexes, the upper vermilion height was littler than the lower vermilion stature. The stature of the upper lip vermilion with respect to the upper lip was fundamentally more prominent in females than in guys. The width of the lips ought to be around 40% of the width of the lower face, and typically equivalent to the separation between the average limbi. The width-to- stature proportion of the face is regularly 3:4, with an oval- formed face being the stylish perfect. The neoclassical ordinance of facial extents isolates the face vertically into fifths, with the width of every eye, the intercantha l separation, and the nasal width all (18).

Conclusion:

1. Bone loss in the edentulous patient increase by aging.
2. Vertical face height in the dentulous group minimal increase by time.

3. Type of the artificial tooth in the edentulous group resaved a denture effected on the-vertical face height.
4. Acrylic tooth wear was decrease the vertical dimensional more than the porclain tooth.
5. Cephalometric radiograph was used to record the vertical dimension.

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