DETERMINING THE OPTIMAL VERTICAL INDEX

Akhmadov Inomjon Nizomitdin
Uzbekistan, Samarkand
acc. of Samarkand State Medical University
inomjonakhmadov1994@gmail.com
Abduqayumov Jamshidbek
Pardayeva Nodirabegim
Imomjonov Sardorbek
Ibodullayeva Shaxrizoda
Student of Samarkand State Medical
University faculty of Dentistry, Uzbekistan

Annotation: There are some references in modern sources, mainly in the section of orthopedic dentistry, where the LVI index was used as a diagnostic tool for prosthetics.

Keywords: LVI index, Shimbachi index, golden ratio.

Introduction. The use of the LVI index in the daily practice of an orthopedic doctor for rapid diagnostics to determine the height of the bite at the end of orthopedic treatment would significantly facilitate the procedure for determining the final interalveolar height without using the lateral TRG. This will allow you to predict the possibilities of orthopedic treatment in advance, especially if the patient is going to have a stage of rational prosthetics.

This is a vertical index that refers to the reconstructive bite, that is, the height of the bite that we plan to get as a result of treatment.

In 1983, Dr. Kh. Shimbachi, examining toothless jaws (400 skulls), determined the optimal vertical size between the deepest point of the vestibule of the oral cavity of the upper jaw and the point of attachment of the gums on the lower jaw along the midline. This number was 36 mm.

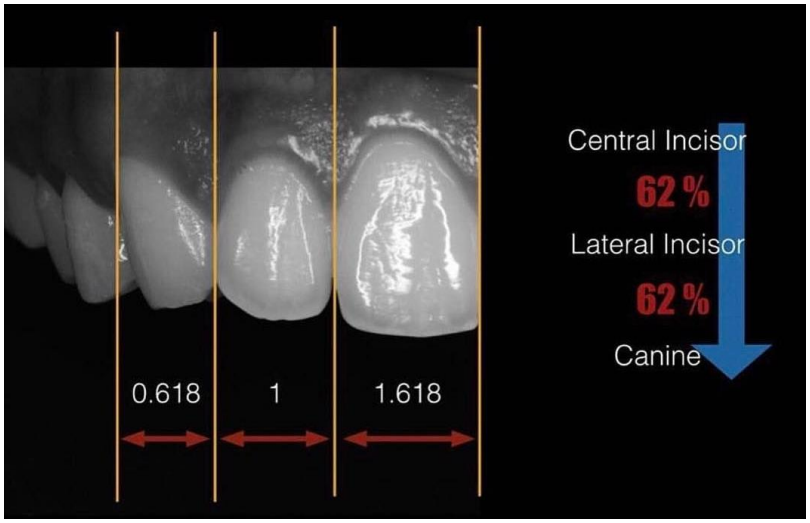
A little later, thanks to research conducted at the Institute of Aesthetic Dentistry in Las Vegas (Las Vegas Institute), a mathematical dependence of the vertical index on the width of the upper central incisors was obtained. The width of the central incisors changes less over the course of a person's life than their length. Therefore, using this measurement gives the most objective results. The calculation of the LVI (Shimbachi) index is based on the "golden ratio"rule. The golden ratio is the ratio of

Incisor width, mm	Ideal length, mm	LVI index
7	9	14,5
8	10,5	17
8,5	11	17,75
9	11,5	18,5
9,5	12,25	20
10	13	21
10,5	13,5	22

two quantities a and b, in which the larger quantity refers to the smaller one as the sum of the quantities to the larger one, that is, a/b=(a+b)/a if a> b. The golden ratio is usually indicated by a capital Greek letter, in honor of the ancient Greek sculptor-architect Phidias and is equal to 1.6180339887498948482, but it is rounded to 1.618. The ratio of the width and length of the upper central incisor is based on the value of 1.29 or 77.5% (average between 75 and 80%), and also the ideal ratio of the length of the incisor 2.1. to the inter-zenith by distance. For example, if the width of the upper central incisor is 8 mm, the ideal length should be 10.5 mm and the LVI index should be 17 mm (the distance between the necks of the upper and lower central incisors). This value is the starting point for determining the vertical bite component. Thus, knowing the width of the central incisors, you can determine their ideal length and vertical index, that is, the height of the bite. The table below shows the dependence of the length and LVI index on the width of the central incisors.

Dependence of tooth length 2.1. and inter-zenith distance on tooth width 2.1. (All figures in the table are rounded to 0.25 mm for convenience).

pic. Definition of LVI index (Shimbachi)



As a rule, the LVI index and the method based on determining the position of physiological rest coincide. However, not all doctors recognize the reliability of the LVI index.

There are other different methods for determining the height of the bite.

Materials and methods

Hardware diagnostic methods (TRG, computed tomography) are aimed at an accurate assessment of the state of the dentoalveolar system. Thanks to the results of these methods, dental specialists can identify pathologies and develop the most effective treatment system for the patient individually.

Results

Determination of the degree of increase in bite height according to TRG data

The term “telerentgenography "comes from the Greek word "tele", which means”far, far away". This method of investigation is based on increasing the distance from the tube of the device to the X-ray film, which makes it possible to obtain an image that best corresponds to the actual dimensions and ratios of bone structures. It is worth noting that an important advantage of TRG is the reflection of the contours of the soft tissues of the face, which has found its application in cephalometric analysis methods. Thus, the main issue of obtaining a telerentgenogram was calculating the distance from the tube to the object. At the moment, the generally accepted distance (according to Doroshenko) is 2 meters 65 centimeters.

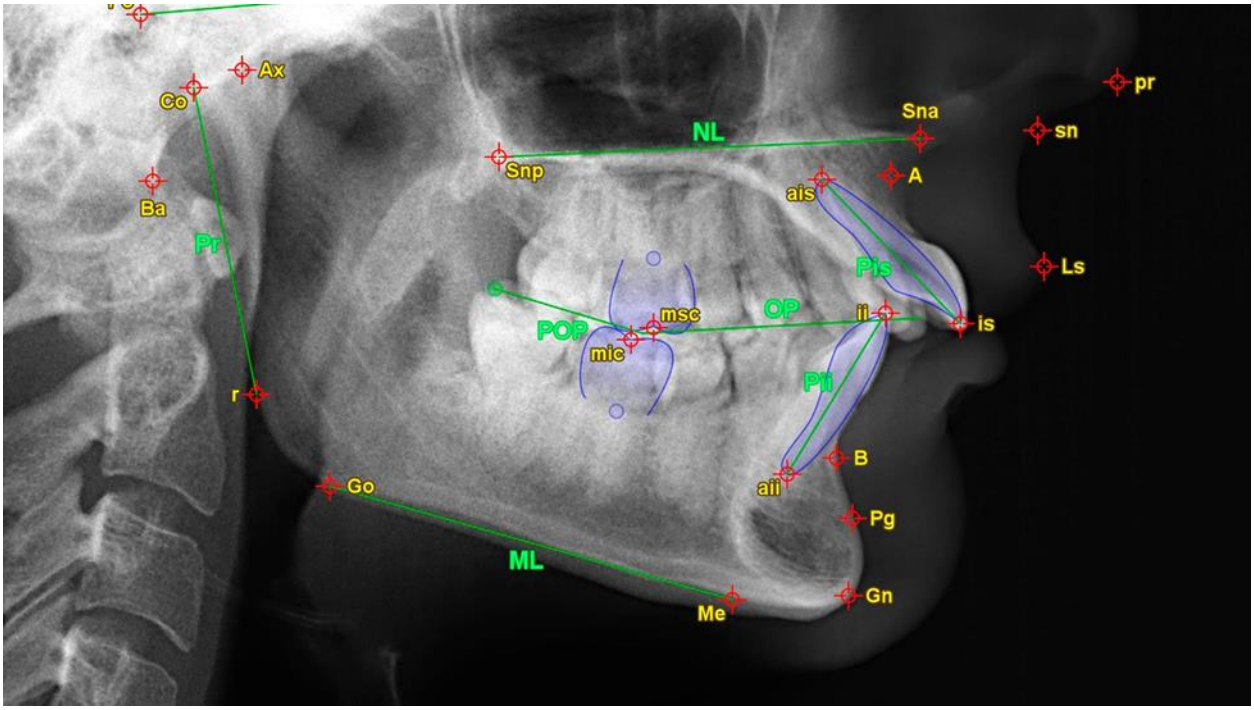
The classic method of getting a snapshot consists of 4 stages:

*the profile of the soft tissues of the face is contoured with a radiopaque substance (barium paste) along the line where the mid-medial plane of the head passes;

• the patient's head is fixed in a cephalostat. This is done by two special ear holders (ear olives) that are inserted into the external ear canal. It is necessary to monitor the coincidence of the Frankfurt horizontal with the horizontal plane (the cephalostat tangents are placed on the lower edge of the eye socket and set at the same level with the ear olives). Parallelism of the sagittal plane of the skull and the cassette is also monitored.

*centering the X-ray beam according to the selected reference point;

*shooting, at this stage the exposure time is selected, it depends on the following



factors: the resolution of the device, the age of the patient.

TRG is an informative diagnostic method in which the doctor receives a detailed image of the skull in different projections. The study provides an opportunity to assess the condition of soft tissues. It is indispensable for an orthopedic surgeon who develops a bite correction scheme for the patient.

The procedure is safe, as the patient receives a minimum dose of radiation that does not go beyond the norm. This allows for repeated diagnostics. Shooting is performed in different projections. For example, orthopedic treatment often requires a frontal and lateral image.

Also, a side telerentgenogram image can be obtained from CT by selecting the sagittal plane, many modern programs allow this to be done. According to the results of the study, CT diagnostic capabilities fully satisfy dentists of all specialties.

Computed tomography. This diagnostic method is characterized by the most accurate results and high information content. CT allows you to get a three-dimensional image that shows the entire dentoalveolar system. Due to the high level of detail and close-to-real scaling, the doctor will see all existing pathologies, which will have a positive impact on subsequent treatment.

Diagnostics is performed by means of a special device – a computed tomograph that works on the basis of special software. The average time of the procedure does not exceed 20 seconds – this time the patient should be in a immobilized state. Special sensors integrated in the device can take up to two hundred images in different projections. The computer uses a 3D program that generates the final result.

CT is the most informative method, so the method is indicated both in orthopedic treatment and implantation, and in the treatment of periodontal pathologies. Also, computed tomography is prescribed before complex surgical operations.

Conclusion: Determining the optimal bite height is one of the most important and urgent problems of both orthopedics and dentistry in general. At the moment, several methods are known for determining the height of the bite. One of them is anatomical and physiological. The method is easy to use, it does not require any additional devices, but it is subjective, since the doctor has to focus on the soft tissues of the face, on the patient's sensations and the individual degree of relaxation of the masticatory muscles. The next method is to determine the bite height using the LVI index (Shimbachi). Cephalometric analysis of telerentgenograms (TRG) of the skull in the lateral projection is used in orthopedics for a deeper understanding of the patient's CSD anatomy. This analysis allows us to assess the size and position of the jaws relative to each other and the skull bones as a whole, which is necessary for planning orthopedic treatment. Cephalometric analysis is not directly intended and does not provide for calculating the bite height. However, since many methods of

cephalometric analysis contain more or less direct or indirect information about the bite height, this possibility is feasible. With the help of techniques, it is possible to determine the optimal bite height, and in the course of treatment it is possible to achieve good results.

Literature

1. Nazhmiddinovich S. N., Obloberdievich S. J. Optimization of Orthopedic Treatment of Dentition Defects in Patients with Chronic Diseases of the Gastrointestinal Tract //Eurasian Research Bulletin. – 2023. – Т. 17. – С. 157-159.
2. Nazhmiddinovich S. N. OPTIMIZATION OF ORTHOPEDIC TREATMENT OF DENTAL DEFECTS IN PATIENTS WITH CHRONIC GASTROINTESTINAL DISEASES //Spectrum Journal of Innovation, Reforms and Development. – 2022. – Т. 10. – С. 53-58.
3. Najmiddinovich S. N. et al. CARIES IN SCHOOL CHILDREN AND TREATMENT PREVENTIVE MEASURES //American Journal of Pedagogical and Educational Research. – 2023. – Т. 16. – С. 44-49.
4. Najmiddinovich S. N. et al. PREVENTION PROGRAM DENTAL DISEASES IN SCHOOL-AGE CHILDREN //Intent Research Scientific Journal. – 2023. – Т. 2. – №. 9. – С. 24-31.
5. Sadriev N., Sanakulov J., Akhmedov I. ANALYSIS OF PROFILE TELERENTGOGRAM AND PLANNING ORTHODONTIC TREATMENT OF DENTAL ANOMALIES AND DEFORMATIONS IN CHILDREN AND ADOLESCENTS USING AUTOMATED EQUIPMENT WITH ELEMENTS ARTIFICIAL INTELLIGENCE" ALLEGRO" //Евразийский журнал технологий и инноваций. – 2023. – Т. 1. – №. 9. – С. 69-71.
6. Sanaqulov J., Sadriyev N., Axmadov I. KERAMIK KIRITMANING BOSHQA RESTAVRATSIYA VOSITALARI BILAN SOLISHTIRISH //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 9 Part 2. – С. 22-26.
7. Sadriev N. et al. DENTAL IMPLANTOLOGY IN THE DIABETIC PATIENTS //Бюллетень студентов нового Узбекистана. – 2023. – Т. 1. – №. 10. – С. 44-48.
8. Akhmadov I. et al. VARK DEPARTMENT OF ORTHOPEDIC DENTISTRY //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 10 Part 3. – С. 57-61.
9. Sadriev N. et al. DENTAL IN CHILDREN WITH TRAUMATIC STOMATITIS COMPLEX DENTAL TREATMENT OF DISEASES AND THEIR EVALUATION OF PREVENTION //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 10 Part 3. – С. 62-65.
10. Akhmadov I. et al. CERAMIC INLAYS COMPARED TO OTHER RESTORATION PROCEDURES //Евразийский журнал технологий и инноваций. – 2023. – Т. 1. – №. 10. – С. 186-191.

11. Sadriev N. et al. PREVENTION OF PROSTHETIC DENTISTRY //Бюллетень педагогов нового Узбекистана. – 2023. – Т. 1. – №. 10. – С. 54-57.

12. Санакулов Ж., Садриев Н., Ахмадов И. КОМПЛЕКСНОЕ ОРТОПЕДО-ХИРУРГИЧЕСКОЕ ЛЕЧЕНИЕ АНОМАЛИЙ И ДЕФОРМАЦИЙ ЗУБОЧЕЛЮСТНОЙ СИСТЕМЫ В СФОРМИРОВАННОМ ПРИКУСЕ С ПРИМЕНЕНИЕМ ЛАЗЕРНЫХ ТЕХНОЛОГИЙ АННОТАЦИЯ //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 9 Part 2. – С. 27-31.

13. Sadriev N. et al. TISHLARNI PROTEZLASH JARAYONIDA ORTOPED STOMATOLOGNING DEONTOLOGIK MUNOSABATGA KIRISHISHI //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 11 Part 3. – С. 109-113.

14. Sadriev N. et al. PANDEMIYA SHAROITIDA STOMATOLOGIK FAVQULODDA VAZIYATLAR BO'YICHA KO'RSATMALAR //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 11 Part 3. – С. 95-99.

15. Zh S., Sadriev N., Akhmadov I. COMPLEX ORTHOPEDIC-SURGICAL TREATMENT OF ANOMALIES AND DEFORMATIONS OF THE DENTAL SYSTEM IN A FORMED BITE USING LASER TECHNOLOGIES ABSTRACT //Central Asian Journal of Education and Innovation. – 2023. – Т. 2. – №. 9 Part 2. – С. 27-31.

16. Sadriev N. et al. COMPLEX ORTHOPEDIC TREATMENT OF ANOMALIES AND DEFORMATIONS OF THE DENTAL SYSTEM IN A FORMED BITE USING LASER TECHNOLOGIES ABSTRACT //Центральноазиатский журнал образования и инноваций. – 2024. – Т. 3. – №. 1 Part 2. – С. 97-101.

17. Nizom S. ASSESSMENT AND COMPARATIVE ANALYSIS OF THE STATE OF THE BUCCALE EPITHELIUM AND ORAL CAVITY HEALTH IN PERSONS HAVING TO SMOK TOBACCO //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 11. – С. 446-450.

18. Sadriev N. et al. CHANGES IN THE PHYSICAL AND CHEMICAL PROPERTIES OF ORAL FLUID DURING THE PROCESS OF ADAPTATION TO DENTAL PROSTHETICS //Центральноазиатский журнал междисциплинарных исследований и исследований в области управления. – 2024. – Т. 1. – №. 1. – С. 16-20.

19. Sadriev N. et al. OPTIMIZATION OF ORTHOPEDIC-DENTAL CARE FOR PUPILS OF SPECIALIZED SCHOOLS FOR CHILDREN WITH MENTAL DISABILITIES //Журнал академических исследований нового Узбекистана. – 2024. – Т. 1. – №. 1. – С. 37-42.

20. Садриев Н. Н. и др. COMPLICATIONS OF CLASP PROSTHETICS WITH LOCKING FASTENERS //American Journal of Pedagogical and Educational Research. – 2023. – Т. 16. – С. 151-157.
21. Najmiddinovich S. N. et al. COMPLICATIONS OF PROSTHETICS WITH CLASP PROSTHESES WITH LOCK FASTENERS //American Journal of Pedagogical and Educational Research. – 2023. – Т. 16. – С. 167-173.
22. Садриев Н. Н. Ранняя диагностика заболеваний пародонта и прогнозирование их развития //IQRO. – 2023. – Т. 3. – №. 2. – С. 117-120.
23. Садриев Н. Н. СОВРЕМЕННАЯ МЕТОДИКА ПРЕПАРИРОВАНИЯ КАРИОЗНЫХ ПОЛОСТЕЙ ДЛЯ ПРОФИЛАКТИКИ РЕЦЕДИВНОГО КАРИЕСА //Conferences. – 2023. – С. 20-21.
24. Shavkatovich O. R. X-Ray Results During the Introduction of Osteoplastic Materials for The Prevention of Atrophy of the Alveolar Process //Eurasian Research Bulletin. – 2023. – Т. 18. – С. 31-34.
25. Shavkatovich O. R. Nizomitdin AI EFFECTIVENESS OF THE USE OF OSTEOPLASTIC MATERIAL" STIMULOSS" IN SAMARKAND //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 11. – С. 612-617.
26. Nizomitdin A. I. Modern Methods of Odontopreparation for MetalCeramic for Beginner Prosthodontists //Eurasian Medical Research Periodical. – 2023. – Т. 18. – С. 98-102.
27. Ахмадов И. Н. Нарушения в системе перекисного окисления липидов при парадантозе //IQRO. – 2023. – Т. 3. – №. 2. – С. 124-127.
28. Ахмадов И. Н. КЛИНИЧЕСКИЕ ОСОБЕННОСТИ И ПРИНЦИПЫ ЛЕЧЕНИЯ АЛЛЕРГИЧЕСКОГО СТОМАТИТА ПРИ ИСПОЛЬЗОВАНИИ ЧАСТИЧНЫХ И ПОЛНЫХ СЪЕМНЫХ ПЛАСТИНОЧНЫХ ПРОТЕЗОВ //ББК 72 И66. – 2021. – С. 262.
29. Nizomitdin A. I. Therapeutic Effect Of Improved Enamel Surface Preparation Technique In The Treatment Of Acute Initial Caries Of Temporary Teeth In Children //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 11. – С. 440-445.
30. Ахмадов И. VARK КАФЕДРЫ ОРТОПЕДИЧЕСКОЙ СТОМАТОЛОГИИ //Евразийский журнал медицинских и естественных наук. – 2023. – Т. 3. – №. 9. – С. 132-136.
31. Ахмадов И. КЕРАМИЧЕСКОЙ ИНКРУСТАЦИИ ПО СРАВНЕНИЮ С ДРУГИМИ ВОССТАНОВИТЕЛЬНЫМИ ПРОЦЕДУРАМИ //Евразийский журнал медицинских и естественных наук. – 2023. – Т. 3. – №. 9. – С. 126-131.
32. Ахмадов И. ОБЗОР СРЕДСТВ ДЛЯ ФИКСАЦИИ ЗУБНЫХ ПРОТЕЗОВ //ЗБІРНИК НАУКОВИХ ПРАЦЬ НАУКОВО-ПРАКТИЧНА КОНФЕРЕНЦІЯ З МІЖНАРОДНОЮ УЧАСТЮ ТА НАВЧАЛЬНИМ

ТРЕНІНГОМ З ОВОЛОДІННЯМ ПРАКТИЧНИМИ НАВИКАМИ «СУЧАСНІ МЕТОДИ ДІАГНОСТИКИ, ПРОФІЛАКТИКИ ТА ЛІКУВАННЯ ОСНОВНИХ СТОМАТОЛОГІЧНИХ ЗАХВОРЮВАНЬ». – 2021. – С. 43.

33. Axmadov I., Sanaqulov J. RAQAMLI TISH QOLIPLARI //Центральноазиатский журнал образования и инноваций. – 2024. – Т. 3. – №. 1 Part 3. – С. 47-51.

34. Ахмадов И., Садриев Н., Санакулов Ж. ЦИФРОВЫЕ СЛЕПКИ ЗУБОВ //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 12 Part 2. – С. 166-171.

35. Sadriev N. et al. ORTHOPEDIST-DENTIST-DEONTOLOGIST IN DENTAL PROSTHETIC SURGERY FACTOR COLLATION //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 12 Part 2. – С. 161-165.

36. Nizomitdin o'g'li A. I., Murodullayevich T. O. ODONTOPREPARATSIYA TUSHUNCHASI //Conferences. – 2023. – С. 84-86.

37. Jamshed S. PREVALENCE OF PHYSIOLOGICAL BITE FORMS IN PEOPLE WITH DIFFERENT FACE TYPES //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 11. – С. 451-454.

38. Obloberdievich S. J. Grade States Fabrics Periodontal by Clinical Indexes //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 5. – С. 175-180.

39. Berdikulovich N. A. et al. CLINICAL AND EPIDEMIOLOGICAL RESULTS OF ORTHOPEDIC TREATMENT OF PATIENTS WITH PARTIAL ABSENCE OF TOOTH //Galaxy International Interdisciplinary Research Journal. – 2022. – Т. 10. – №. 1. – С. 958-960.

40. Садриев Н., Ахмадов И., Санакулов Д. СОВРЕМЕННЫЕ АСПЕКТЫ ЭТИОЛОГИИ И ПАТОГЕНЕЗА ЗАБОЛЕВАНИЯ ПАРОДОНТА //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 11 Part 3. – С. 100-108.