INTERNATIONAL JOURNAL OF
INTEGRATIVE AND
MODERN MEDICINE

Temporary Structures and Various Splinting Devices Used for Dental Mobility

Aliyeva Nazokat Muratjonovna
Department of orthopedic dental propedeutics Candidate of Medical Sciences Associate Professor
Tashkent State Dental Institute

Ochilova Malika Ulmasovna
Assistant of the Department of orthopedic dental propaedeutics Tashkent State Dental Institute

Annotation: The article provides examples of the use of various techniques of temporary splinting of teeth. The main task of temporary splinting of teeth with periodontal tissue damage is to unload and unite the teeth, followed by fixation of weakened periodontal tissues in the presence of traumatic articulation or formed traumatic nodes. Temporary structures and various splinting devices will make it possible to fix movable teeth and optimally redistribute the chewing load to both movable teeth and those teeth that have a fairly well-preserved periodontal or teeth that do not participate in all acts of chewing food.

Keywords: dentistry, orthopedic dentistry, splinting of teeth, dental mobility, periodontal diseases, temporary splinting.

Introduction. The indications for splinting teeth are based on an assessment of their mobility and an assessment of the condition of periodontal tissues, which is determined on the basis of clinical and X-ray examination after therapeutic and surgical treatment [1]. If the bone tissue is reduced by half the length of the tooth root, horizontal splinting should be performed, which consists in using the methods of sagittal and transversal splints. When diagnosing bone loss up to three-quarters of the root length and grade II-III tooth mobility, rigid splinting in three planes (vertical, sagittal and transversal) should be used. The purpose of temporary splinting is: 1. Creating rigid fixation of movable teeth using various temporary or permanent structures, splints and orthopedic devices; 2. By combining a group of teeth or the entire dentition into one block, to achieve the restoration of contact points, while increasing the periodontal resistance of individual teeth to chewing pressure; 3. The creation of a block of splinted teeth, as a result of which the migration of teeth is inhibited in three directions; for the anterior in sagittal, vertical and transversal, for the lateral in sagittal, vertical and horizontal; 4. The use of splinting devices reduces local trauma to individual teeth by redistributing the chewing load to a large group of teeth; 5. Do not create retention points for delaying food residues and not irritating periodontal tissues; 6. Do not interfere with the therapeutic and surgical treatment of weakened periodontal tissues of movable teeth. The degree of tooth mobility, the condition and severity of periodontal tissue inflammation underlie the choice of the type of stabilization — frontal (anterior section); — sagittal (lateral section of the dental arch); — fronto-sagittal; parasagittal; — arc stabilization. With preserved dentitions with weakened periodontitis, splinting of movable teeth involves combining them into a single block, planning the optimal splint design in order to maximize the integration of a large number of teeth with weakened and preserved periodontitis [2]. In case of violation of the integrity of the dentition, splinting of movable teeth should be performed with simultaneous restoration of dentition defects. At the same time, it is necessary to distinguish between the splinted group of teeth and the prosthetic structure, which, in most cases, in one way or another, loads the splinted teeth through a system of supports on the retaining and locking fasteners of the dentures [14]. When choosing such device designs, their supporting and retention functions should be optimally distributed with minimal injury and overload of the remaining teeth. Orthopedic structures used in the process of complex treatment of patients with periodontal tissue diseases are represented by temporary and permanent splints and prosthetic structures. Temporary splints are used to stabilize

mobile or migrating teeth both during the entire medical, therapeutic and surgical treatment methods, as well as during the manufacture of permanent splints or during the manufacture of a permanent prosthetic structure. Temporary splints should be used to carry out and consolidate the results of orthodontic treatment for slightly tilted teeth or their migration. Temporary splints ensure optimal distribution of masticatory pressure between the periodontium of affected and intact teeth, creating peace of mind for affected tissues, improving their trophism, and removing the inflammatory component in periodontal tissues. Temporary splints are widely used in the advanced stages of focal and generalized periodontitis [15]. Their use makes it possible to evenly redistribute the mechanical energy of chewing pressure between the periodontal teeth included in the block, creating peace for the affected tissues, which improves blood supply to periodontal tissues and reduces the inflammatory process. The absolute indication for the manufacture of a temporary splint is gingivotomy and gingivectomy. Methods and technologies for manufacturing temporary tires were proposed and changed depending on the level of technology and materials development in the industry. In 1916, Ciezynski proposed the ligature binding of movable teeth with bronze-aluminum wire, 0.5 mm thick, or stainless steel soft wire, 0.3—0.4 mm in diameter. Movable teeth were attached to more stable teeth. Twisting of the wire is carried out in the interdental spaces in order to make the movable teeth more rigid. After the appearance of self-hardening acrylates in the 30s of the XX century. Glickman suggested strengthening the tire made of wire with fast-hardening acrylic plastics, which prevent relaxation of the wire coils and injury to the interdental papillae. Novotny recommended a fully acrylate splint for movable teeth, which, in the form of a strip up to 2 mm thick, fixes movable teeth from the lingual surface and fills the interdental spaces without injuring the interdental papillae. In recent decades, temporary tires have become widespread, which can be used for up to 5-7 years and are made from acrylic plastic or using light-curing composites. Splints can be mouth guards (manufactured in the laboratory and covering teeth from the vestibular and oral surfaces), orally-vestibularly located in the corresponding surface of the dentition and fixing movable teeth [11], [17]. The use of modern composite materials has significantly expanded the indications for the use of temporary splints that optimally fix movable teeth in compliance with aesthetic and hygienic requirements directly at the chair. If the front teeth are lost, it is possible to replace individual teeth with the help of composites. Depending on the chemical composition, two types of materials are used for splinting movable teeth: based on the inorganic matrix GlasSpan and FiberSplint (Switzerland); based on the organic matrix of polyethylene Ribbon (USA) and Connect (USA). These materials are based on a matrix of the finest polyethylene or microfiber quartz fibers impregnated with a composite material that allows them to be fixed tightly enough to the crown of the teeth, then composite materials are added to the matrix in order to better mechanically fix the movable teeth, creating a single splinting unit. Recently, introral scanning has been widely used in dentistry. [3], [4], [5], [6]. This method allows you to accurately obtain a digital model of the relief of objects in the oral cavity. [8], [10], [12], [13]. After receiving the optical impression, various protective caps, temporary splints and splints are manufactured on CAD/CAM systems. An important feature of CAD/CAM systems available on the modern market is their versatility in terms of the choice of structural materials [6]. The technological capabilities of the equipment provide not only computer modeling of the prosthesis design, but also direct execution of the finished product, which provides, in particular, orthopedic dentistry with the necessary resource for creating various temporary splints, taking into account the personal anatomical and physiological features of the facial skull structure. [7], [8], [9]. A sufficiently strong splint structure can be made using twisted titanium or stainless steel wire. Before making a splint, all supra- and subgingival dental deposits should be carefully removed. The interfering contact points during sagittal and transversal physiological movements within the occlusion field are verified and then ground using a carbon marker. With a diamond drill 1-2 mm above the lingual tubercles on the lower jaw or below the palatine tubercles of the upper jaw, the cutting surface of the teeth is marked and prepared in order to create retention points or form a groove into which a fixing tape or twisted titanium wire will be laid on movable teeth. After thorough washing of the composite application sites, etching of the contacting surfaces is carried out, followed by copious amounts of water, washing off the etching gel. Then bonding is applied to the surface to be prepared, which is carefully blown with a fan over the drilled

surface of the movable teeth. Bonding is illuminated with the help of a helium lamp. A small amount of composite is placed in the prepared groove, into which a splint tape or wire is pressed in the area of one or two teeth. After highlighting the composite, the tape is similarly reinforced into the grooves of the remaining teeth, splinting the remaining movable teeth. After fixing the splint tape, the light-curing composite, taking into account the anatomical shape of the teeth, is applied to all retention points and strengthens the interdental contacts of the teeth. After the final polymerization of the composite with the help of drills and polishes, the final surface treatment of the splinting structure is carried out, the final alignment of the occlusal contacts is carried out with the obligatory release of the posterior interdental papillae. Similar designs of manufactured tires can last up to 3-5 years. The duration of use of such a tire is determined by the available dental mobility, oral hygiene and methods of therapeutic treatment of periodontal tissue diseases. In the process of work, it is very important to take into account the characteristics of the materials from which future structures will be made [20], [21]. Intolerance to dental materials can be caused by various reasons: galvanism, allergic reactions to dental materials, toxic damage to the mucous membrane, etc., therefore, strict quality control of the materials used is necessary (to prevent the use of counterfeit products) and additionally, if necessary, to conduct a joint analysis of the materials by a dentist and an immunological laboratory [16], [18], [19]. If single teeth are lost in the frontal part of the dentition, it is possible to manufacture a missing tooth from a photo-cured composite with tape or wire attached to the remaining teeth. Such tire designs can be made with teeth mobility up to 2/3 bone loss.

Conclusions: Thus, with grade I—II dental mobility, it is possible to manufacture a splint prosthesis without reinforcing tape or wire. The simplest and most effective method of manufacturing a temporary splint structure is a temporary splint made of transparent polycarbonate material, prepared on a durable gypsum model using vacuum forming machines. The tire is removable, fits well enough and is fixed on movable teeth. With its help, it is possible to restore individual teeth.

List of used literature:

1. Sevbitov A.V., Brago A.S., Kanukoeva E.Yu., Yumashev A.V., Kuznetsova M.Yu., Mironov S.N. Dentistry: An introduction to orthopedic dentistry // – Rostov-on-Don.: Phoenix, 2015, – 91 p.
2. Sevbitov A.V., Admakin O.I., Platonova V.V., Brago A.S., Bondarenko I.V., Zolotova E.V., Kanukoeva E.Yu., Selifanova E.I., Skatova E.A., Yumashev A.V., Kuznetsova M.Yu., Mironov S.N., Dorofeev A.E. Dentistry: organization of dental care and anatomy of teeth // – Rostov-on-Don.: Phoenix, 2015, 155 p.
3. Doroshina I.R., Yumashev A.V., Mikhailova M.V., Kuderova I.G., Kristal E.A. – Orthopedic treatment of patients with increased gag reflex // Dentistry is for everyone. 2014. No. 4. pp. 18-20.
4. Ryakhovsky A.N., Zheltov S.Yu., Knyaz V.A., Yumashev A.V. – Hardware and software complex for obtaining 3D models of teeth // Dentistry. - 2000. – Vol. 79. – No. 3. – pp. 41-45.
5. Ryakhovsky A.N., Kaganovsky I.P., Lavrov V.A., Yumashev A.V. Issues of computer-aided design and manufacture of dentures. // Materials of the dental conference "Ways of dentistry development: results and prospects". Yekaterinburg, 1995. pp. 223-226.
6. Ryakhovsky A.N., Rassadin M.A., Levitsky V.V., Yumashev A.V., Karapetyan A.A., Muradov M.A. – An objective methodology for assessing changes in the topography of objects of the oral cavity // Panorama of orthopedic dentistry. - 2006. – No. 1. – pp. 8-10.
7. Ryakhovsky A.N., Yumashev A.V. – Options for using CAD/CAM systems in orthopedic dentistry // Dentistry. 1999. Vol. 78. No. 4. pp. 56-58.
8. Ryakhovsky A.N., Yumashev A.V., Levitsky V.V. A method for constructing a three-dimensional image of a face and dentition rows juxtaposed in a correct position relative to each other // Patent for Invention RUS 2306113 09/28/2006.
9. Sevbitov, A.V., A study of the retention capacity of individual protective dental splints relative to the boundaries of their base / A.V. Sevbitov, V.V. Borisov, E.Yu. Kanukoeva, A.V. Yumashev,

E.P. Safiullina // Proceedings of the International Symposium Reliability and Quality. – 2015. – Vol. 2. – pp. 363-364.

10. Yumashev A.V., The use of the analysis of the relief of the dentition and their fragments in the planning and implementation of orthopedic treatment with fixed structures of dentures: abstract. Dissertation of the Candidate of Medical Sciences / Central Scientific Research Institute of Dentistry and Maxillofacial Surgery (TSNIIS). – Moscow. - 1999. – 18 p.
11. Sevbitov A.V. Assessment of the quality of life of orthodontic patients with traumatic lesions on the oral mucosa / A.V. Sevbitov, A.S. Nevdakh, V.V. Platonova, M.Yu. Kuznetsova, A.V. Yumashev // Proceedings of the International Symposium Reliability and Quality. – 2015. – Vol. 2. – pp. 368-369.
12. Yumashev A.V. A system for obtaining and computer analysis of information about the relief of objects in the oral cavity. // Collection of abstracts of the XX Final interuniversity Scientific Conference of young scientists. – Moscow. - 1998. – p. 19.
13. Yumashev A.V., Mikhailova M.V., Kuderova I.G., Kristal E.A. – Options for using 3D scanning in orthopedic dentistry // Bulletin of New Medical Technologies. Electronic edition. 2015. No. 1. pp. 2-6.
14. Sevbitov A.V., Mitin N.E., Brago A.S., Kotov K.S., Kuznetsova M.Yu., Yumashev A.V., Mikhalchenko D.V., Tikhonov V.E., Shakaryants A.A., Perminov E.S., Fundamentals of dental prosthetic technique // – Rostov-on-Don.: Phoenix, 2016, 332 p.
15. Sevbitov A.V., Mitin N.E., Brago A.S., Mikhalchenko D.V., Yumashev A.V., Kuznetsova M.Yu., Shakaryants A.A., Dental diseases // – Rostov-on-Don.: Phoenix, 2016, 158 p
16. Iron A.S., Yumashev A.V. Mikhailova M.V. – Treatment of patients with an allergic history with orthopedic structures based on titanium alloys using CAD/CAM technology. // New science: Strategies and vectors of development. – 2016. – № 2-2 (64). – Pp. 44-48.
17. Salimov O. R., Ochilova M. U. EVALUATION OF THE QUALITY OF DISPLAYING THE DIMENSIONAL ACCURACY OF A TOOTH STUMP OBTAINED BY SCANNING ON 3D PROGRESS AND MHT OPTICAL RESEARCH AG AND TRIOS (3SHAPE A/S) INTRAORAL SCANNERS IN VITRO //Conferences. – 2024. – Vol. 1. – No. 1. – PP. 360-361.
18. Salimov O. R., Ochilova M. U. EVALUATION OF THE QUALITY OF DISPLAYING THE DIMENSIONAL ACCURACY OF THE TOOTH STUMP OBTAINED BY SCANNING ON 3D PROGRESS AND MHT OPTICAL RESEARCH AG AND TRIOS (3SHAPE A/S) INTRAORAL SCANNERS IN VITRO //Conferences. – 2024. – Vol. 1. – No. 1. – pp. 360-361.
19. Ochilova M. U. MODERN APPROACHES TO THE TREATMENT OF PARADONTITIS //Conferences. – 2024. – Vol. 1. – No. 1. – pp. 350-354.
20. Salimov O. et al. APPLICATION OF SIMULATION TRAINING IN MANUAL SKILLS AT THE DEPARTMENT OF PROPAEDEUTICS OF ORTHOPEDIC DENTISTRY //Medicine and Innovations. – 2023. – Vol. 12. – No. 4. – pp. 26-33.
21. Iron A.S., Yumashev A.V., Mikhailova M.V. – Treatment of patients with a burdened allergic history with orthopedic structures based on titanium alloys using CAD/CAM technology. // New science: Strategies and vectors of development. – 2016. – № 2-2 (64). – Pp. 44-48.