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STATISTICAL ANALYSIS OF REPAIR OF COMPLETE REMOVABLE DENTURES ON THE UPPER JAW FOR A THREE-YEAR PERIOD OF USE

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Ключові слова: *верхня щелепа, повна адентія, повний знімний протез, базис, лагодження протеза, термін користування*

Ключевые слова: *верхняя челюсть, полная адентия, полный съёмный протез, базис, лагодження протеза, срок пользования*

Abstract. *Statistical analysis of repair of complete removable dentures on the upper jaw for a three-year period of use. Vasilenko R.E. The aim of the study is to analyze the use of full dentures on the upper jaw and the number of repeated visits of patients who received treatment at the dental offices in the Dnepr city. Materials and methods:*

during 2015–2017 years in dental office of the SE “DMA”, patients were examined, a statistical analysis was made, the number of manufactured of full dentures on the upper jaw and, accordingly, the number of repairs for each year and comparison statistics with the city dental clinics in the previous years was done. According to the results of the study, it was established then in three-year examination period the patients in three dental clinics of the city, the percentage of breakdowns and correction of full dentures on the upper jaw was near 50%. At dental office of SE “DMA”, according to the results 2015-2017 years a number of 48.4% was obtained. So that when we compared with the dental clinic from the previous study that is closest in scope of the work, it indicates the absence of statistically significant differences in the indicators of the first and second studies. This can be explained by the fact that despite the use of more modern materials and methods in the manufacture of complete dentures, the problem of improving the quality of full dentures manufacturing on the upper jaw and increasing the strength of the base has not been fully resolved.

Реферат. Статистический анализ ремонтов полных съемных протезов верхней челюсти за трехлетний период использования. Василенко Р.Э. Цель исследования - анализ пользования полными съемными пластинчатыми протезами (ПСПП) на верхнюю челюсть и количества повторных обращений пациентов, получавших помощь на базе стоматологических отделений г. Днепра. Материалы и методы: обследованы пациенты на базе клиники ГУ «ДМА» на протяжении 2015-2017 гг., проведен статистический анализ количества изготовленных полных съемных протезов на верхнюю челюсть и соответственно количества починок за каждый год. Проведено сравнение статистических данных 3-х стоматологических поликлиник города в предыдущие годы. По результатам скрининг-исследования пациентов 3-х поликлиник города в предыдущие годы средний процент поломок и коррекций полных съемных пластинчатых протезов на верхнюю челюсть в среднем приближен к 50%. На базе клиники ГУ "ДМА" по результатам исследования получено число в 48,4%, что при сопоставлении с наиболее близкой по объему выполненным работ поликлиникой из предыдущего исследования указывает на отсутствие статистически значимых отличий показателей первого и второго исследований. Это может объясняться тем, что, несмотря на применение более современных материалов и методов при изготовлении базисов ПСПП, проблема улучшения качества изготовления ПСПП на верхнюю челюсть и повышения прочности базиса до конца не решена.

Presently in Ukraine a lot of elderly people experience a complete absence of teeth. The percentage of such people aged 60-69 is 9.9%, at the age of 70-79 years – up to 29.0%, over 80-89 years – 40.2% and it attains a maximum in the group above 90 years – 78.4% [3]. Despite the rapid development of dental implantology, complete removable prosthesis remains the most common type of orthopedic dental care, and 58 people per 1,000 are in need for it [4]. The most often acrylic plastics are used in the manufacture of complete removable dentures bases – in 98.0% of cases [1]. Despite the fact that this kind of dental materials is quite popular in dentures, it has a number of shortcomings, one of which is insufficient strength. According to the generalized data of various statistical analyses, the number of damages and remodeling of complete removable dentures, made of modern acrylic base materials in the first year of usage is from 3 to 14,2%, over a 3-year period of dispensary follow-up it is about 50%. The literature data [5] show that most of the cases of damages and cracks in the base of the complete removable laminar dentures (CRLD) of the upper jaw – 52.4% are those that began between the central and lateral incisors, further along the projection of the palatine suture, with the ending in the distal part of the denture. In the next group of frequency, the fracture line began between the canine tooth and the first premolar – 47.5% of cases, distributing almost equally between the right and left

side and ending at a distance of 0.2-0.8 cm from the median line of the base of the complete removable denture of the upper jaw.

The purpose of the study was to analyze the use of complete removable laminar dentures on the upper jaw and the number of repeated visits of patients who received treatment at the dental offices in Dnipro city.

MATERIALS AND METHODS OF RESEARCH

In order to objectify the data on the state of the CRLD of the upper jaw during their usage, we carried out two screening investigations covering a 3-4 year period of dispensary follow-up of patients with CRLD.

The first study was conducted among patients on the basis of three orthopedic departments of the dental institutions of Dnipro: CI "Regional Dental Clinic", CI "City Dental Clinic N 1", CI "City Dental Clinic N 2" during 2007-2010. The second one - among 540 patients who received treatment in the dental clinic of SE "Dnipropetrovsk Medical Academy of Health Ministry of Ukraine." in 2015-2017.

The statistical processing of the study results was carried out using statistical software package Statistica version 6.1[®]. Data are presented as mean and standard error ($M \pm m$). The reliability of the differences was evaluated in paired comparisons by Mann-Whitney (U) criterion, with multiple comparisons of 3 groups - according to the Kruskal-Wallis criterion (H).

RESULTS AND DISCUSSION

According to the results of the first study conducted in 2007-2010, data were obtained on the number of manufactured and repaired CRLDs during this period (Fig. 1).

The calculation of the specific gravity of the repair of CRLDs of the upper jaw among established

dentures showed that the proportion of additional interventions of the orthopedist or dental technician exceeds 50% and does not significantly depend on the medical institution, especially with large volumes of work (Fig. 2).

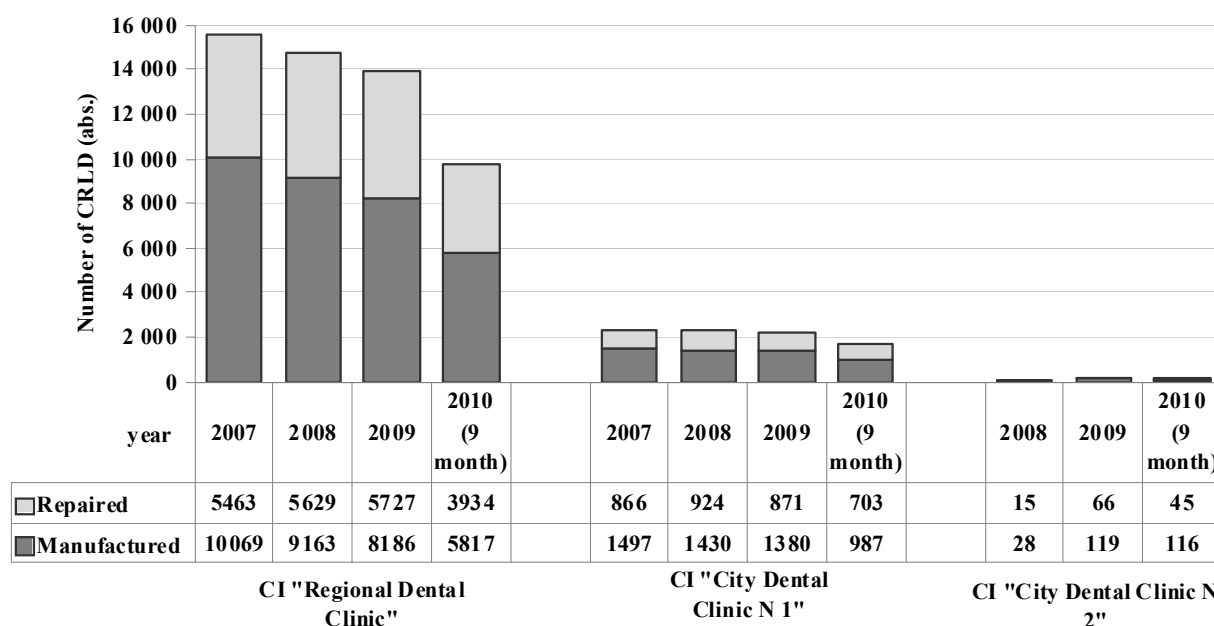


Fig. 1. The total number of manufactured and repaired CRLDs in 2007-2010 on the basis of orthopedic departments of the dental institutions of Dnipro

Thus, the average index of the relative number of repaired CRLDs in the CI "Regional Dental Clinic" was 63.3±3.5% annually, in the CI "City Dental Clinic N 1" – 64.2±2.8% (p=1.0 according to criterion H), in the CI "City Dental Clinic N 2" – 49.3±5.3% (p=0.196 and p=0.097 in comparison with the previous groups according to criterion H).

In order to compare the current trends in the quality of the manufacture of CRLD with past years, a study was conducted on the basis of the clinic of SE "DMA HM of Ukraine during 2015-2017. The obtained data also indicate a high percentage of the number of repairs of CRLD of the upper jaw – 48.4±0.6% (tabl.).

A comparative analysis of the data on a relative number of CRLDs repair for both periods of observation conducted between the medical institutions CI "City Dental Clinic N 2" and the clinic of the SE "DMA HM of Ukraine", taking into account the same volumes of work, showed a lack of statistically

significant differences between the mean indicators for a three-year period of observation – 49.3±5.3% versus 48.4±0.6% (p=0.513 according to criterion U).

Thus, based on the findings of the first study, it can be concluded that more than 50% of CRLD on the maxilla during three years of operation require the intrusion of an orthopedist or dental technician. This indicates a high number of repeated visits due to fractures, cracks and remodeling of the bases of CRLD of the upper jaw. Among the reasons that cause this phenomenon is the unsatisfactory strength of acrylic plastics ("Fluorax", etc.), unfavorable conditions of prosthetics in elderly patients, processes of atrophy of the alveolar process and mucous membrane. It is also necessary to note a slightly higher number of repeated visits to CI with a large volume of made dentures, compared to CI, which produced a smaller number of dentures – by 14.45%. This moment needs further study.

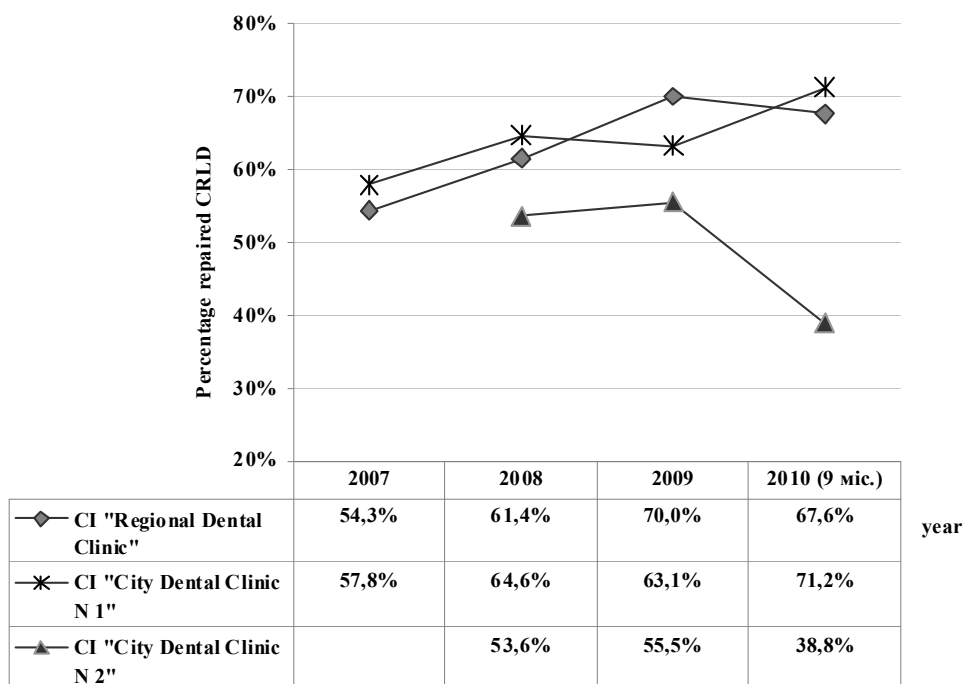


Fig. 2. Dynamics of the relative quantity (%) of repaired CRLDs in 2007-2010 on the basis of orthopedic departments of dental institutions

The recent data of the other observation, performed on the basis of the clinic of the SE "DMA of HM of Ukraine" during 2015-2017, and their comparison with the data of the CI "City Dental Clinic N 2" from the first study, as the closest in the volume of work, indicates statistically insignificant differences in the number of repairs of CRLDs of the upper jaw. This can be explained by the fact that, despite the use of more advanced materials and methods for the manufacture of the bases of CRLD, the problem of improving quality of their manufacturing and increasing their strength is not fully resolved. The study of the problem of correlation between the number of manufactured and

repaired dentures gives us the opportunity to state that, despite a slight decrease in the ratio of the number of originally made dentures to repaired ones, this percentage remains rather high. It should be noted that indirect prosthesis rebase and repair are half-measures that do not affect the causes of this prosthesis failure. Accordingly, unnecessary waste time of the doctor and dental technician, additional costs of materials and material loss confirm the need for using methods of strengthening acrylic basis of the CRLD to identify the causes leading to the destruction of the denture bases, and the technique we propose to prosthetics is one of the ways of dealing with.

The total number of manufactured and repaired CRLD in 2015-2017 on the basis of the clinic of SE "DMA"

Index	Year of study			Mean, M±m
	2015	2016	2017	
Number of CRLD, abs.	173	156	211	180.0±16.3
Number of repair of CRLD, abs.	82	77	102	87.0±7.6
Number of repair of CRLD, %	47.4	49.4	48.3	48.4±0.6

CONCLUSIONS

1. More than 50% of patients who received orthopedic treatment with full removable dentures on the upper jaw sought for the dentist to fix the prosthesis over a three-year follow-up period.

2. During the second observation and comparison of the indices with the data of the pre-

vious one, statistically significant differences were not revealed, which indicates the relevance of finding ways to strengthen CRLD basis and reduce the number of secondary visits to dental clinics.

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