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Features of Prosthetics in Elderly People

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Annotation:
This article focuses on the role and significance of prosthetics for elderly individuals, exploring the specific challenges and considerations involved in prosthetic care for the aging population. As individuals age, changes in body structure, bone density, and skin elasticity impact the design and functionality of prosthetic devices. This study examines the use of prosthetics in elderly people, discussing their practical application and adaptability to age-related physiological changes. Additionally, the article explores the potential benefits of modern technologies, such as 3D printing and smart prosthetics, in enhancing the comfort and effectiveness of prosthetic solutions for older adults. The research highlights key factors that need attention when selecting prosthetics, including comfort, long-term usability, and the need for restored physical activity. The findings of this research will contribute to the development of new design directions and technological advancements in prosthetics aimed at improving the quality of life for the elderly population.

Keywords:
Elderly prosthetics, aging population, mobility aids, prosthetic technology, quality of life, advanced prosthetics, 3D printing, smart prosthetics, elderly care, rehabilitation, disability aids.

Introduction:

Prosthetics in elderly people play a significant role in improving their quality of life, enhancing mobility, and increasing independence. As the global population ages, the need for effective and accessible prosthetic solutions has grown substantially. Prosthetics for older adults differ in several ways from those used by younger individuals, due to unique age-related factors such as decreased bone density, changes in skin elasticity, and a greater likelihood of comorbidities. Additionally, elderly people often experience reduced physical activity levels, which can influence the design and functionality of prosthetic devices. Understanding these characteristics is crucial in developing prosthetic solutions that meet the specific needs of this demographic. The integration of advanced technologies, such as 3D printing and smart prosthetics, has also revolutionized the field, providing enhanced customization and comfort. However, challenges remain in terms of affordability, maintenance, and the need for ongoing care, which must be addressed for these devices to become fully accessible and beneficial to the elderly population.

Methodology:

Gerostomatology deals with the maintenance, treatment, and rehabilitation of oral health in elderly and aged individuals. This field has developed as a special branch of dentistry since the early 20th century (first introduced by Rybnikov in 1919).

Elderly and aged patients have always been at the center of attention for orthopedic dentists because they make up about two-thirds of all dental patients. In this category, irreversible changes occur in various processes — material, functional, psychological, and individual — which are all encompassed by the term “gerostomatology.”

The process of longevity is ongoing, and it is expected that by 2030, the number of people aged 60 and above will double compared to 2010.

Age-related changes include:

- Material changes (bone tissue resorption, tooth loss),
- Functional changes (chewing, swallowing, and speech disorders),
- Psychological changes (difficulty adapting, depression, neurotic states),
- Intensification of individual traits (suspiciousness, argumentativeness, pessimism).

The combination of these changes makes dental treatment in elderly patients more difficult and requires an individualized approach.

The general health condition, limited mobility, and the presence of multiple systemic diseases (polypathy) negatively affect the patient’s ability to receive dental care. Often, elderly people have 6–8 coexisting diseases, which lead to both physical and psychological disorders.

Characteristics of dental problems in elderly people

1. Polypathy – Most elderly individuals have several (6–8) chronic diseases (hypertension, diabetes mellitus, cardiovascular disorders, degenerative joint diseases, etc.), which complicates the planning of dental treatment.
2. Psychological condition – Elderly patients often experience difficulty adapting, irritability, memory impairment, and suspiciousness, which makes it challenging for them to get used to new dentures.
3. Sensory changes – Decline in vision and hearing, as well as reduced motor coordination, make the use of dentures more difficult.
4. Typical dental issues:

o Complete or partial edentulism,

o Bone resorption and changes in the prosthetic bed,

- Wear, fracture, or loss of fit of old dentures,
- Difficulty adapting to dentures.

Approximately 20% of elderly people require treatment from specialists of different medical fields. Their psyche changes: previously compensated negative personality traits become more pronounced in old age. Many of them become suspicious, easily offended, irritable, prone to pessimistic thinking, and tend to draw negative conclusions. The reactions of others often reinforce these feelings.

Their way of thinking changes — they develop stubborn ideas and memory impairment. Visual and auditory abilities, as well as memory, decline. They may develop a belief that "everyone is doing things wrong," accompanied by a tendency toward inventiveness or self-justification.

In most of these patients, borderline neuropsychiatric disorders manifest as neurotic reactions (neurasthenia, hysteria, phobias, depression). As age increases, the ability to form new dynamic stereotypes weakens, making adaptation — particularly to dentures — more difficult.

Such patients are characterized by general tension, constant dissatisfaction, irritability, narrowing of interests, and at the same time, an increased tendency to argue. The following clinical case illustrates the development of a litigious (querulous) personality type, characterized by directness, suspicion, and conflict-prone behavior.

Based on the patients' informed consent, individuals of both genders over the age of 60 were examined. Their medical records and case histories were reviewed, followed by clinical examinations and photo documentation. As a result of clinical evaluation of 64 patients, the following indicators were determined:

- Number of prostheses to be fabricated for the upper jaw – 26
- Number of prostheses to be fabricated for the lower jaw – 27
- Number of complete removable dentures (CRD) to be fabricated – 32
- Number of partial removable dentures (PRD) to be fabricated – 21

Patients with satisfactory dentures:

- CRD – 14 patients; average denture age – 3 years
- PRD – 10 patients; average denture age – 2.2 years

Patients with unsatisfactory dentures:

- CRD – 43 dentures in 25 patients; average denture age – 8.6 years
- PRD – 27 dentures in 18 patients; average denture age – 6.8 years

The condition of the dentures was assessed according to several factors determining the need for new prostheses:

1. Poor fixation due to extracted teeth and altered prosthetic bed boundaries – 26
2. Non-aesthetic appearance – 12
3. Pain while wearing the prosthesis – 6
4. Gag reflex – 1
5. Previous repair traces – 6
6. Occlusal wear of artificial teeth – 30
7. Fracture of the base or loss of artificial teeth – 1

Conceptual distinction between "re-prosthetics" and "reconstruction prosthetics"

It is fundamentally important to distinguish between re-prosthetics and reconstruction prosthetics:

- Re-prosthetics refers to the fabrication of a new prosthesis for a patient due to certain clinical indications.
- Reconstruction prosthetics refers to the creation of a duplicate or a prosthesis as close as possible to the existing one.

The essence of our study was to identify and provide orthopedic treatment for patients in need of reconstruction prosthetics. This category includes patients aged 60–75–90 with severely

reduced adaptive capacity, who already possess a second set of dentures but continue to use old, unsatisfactory ones.

Conclusion

One of the important findings of the study was that 36% of patients required re-prosthetics — that is, replacement of old removable dentures with new ones. However, a more significant result within this work was the identification of 6 patients (9%) who required reconstruction prosthetics, meaning the fabrication of duplicates of their existing dentures.

Elderly patients often refuse reconstruction prosthetics because of weak adaptability and difficulty adjusting to new dentures. It is nearly impossible to create an exact copy of their “favorite” old prosthesis using conventional methods. However, modern computer technologies now make it possible to produce accurate duplicates of old dentures, which greatly facilitates adaptation and improves the patients’ quality of life.

The role of modern technologies

In traditional methods, reproducing an exact copy of an old denture was extremely difficult. However, digital dentistry and CAD/CAM technologies have solved this problem through the following steps:

- 3D scanning of the old denture,
- Creation of a digital model with identical morphology and dimensions,
- Fabrication of a new denture using high-precision 3D printing or milling.

This approach significantly simplifies the adaptation period for elderly patients and enhances their overall quality of life.

References

1. Лебеденко, И. Ю. CEREC: новые горизонты / И. Ю. Лебеденко, М. В. Ретинская, Н. К. Вураки // Стоматологическое образование. – 2014. – № 48. С. 40-41.
2. Лебеденко, И. Ю., Исследование эластичных материалов для мягких Подкладок съемных зубных протезов / И. Ю. Лебеденко, К. Г. Налбандян,А. Б. Перегудов, И. А. Воронов // Новое в теории и практике стоматологии. Сб. Науч. Тр. – Ставрополь, 2003. – С. 276-281.
3. Лебеденко, И. Ю. Руководство по ортопедической стоматологии. Протезирование при полном отсутствии зубов. / И. Ю. Лебеденко, Э. С. Каливраджиян, Т. И. Ибрагимов. – М., 2005. – С. 387
4. Вураки, Н. К. Повышение эффективности ортопедического лечения Больных старческого возраста с полным отсутствием зубов : дис. … канд. Мед.наук / Н. К. Вураки. – М., 2006. – 136 с.
5. Wysokinska-Miszczuk J. Health of the stomatog-nathic system in old people // Wiad.Lek. — 1989. — Vol. 42. — № 10. — P. 636—640.
6. Carlos J.P., Wolfe M. D. Metodological & nutritional issues in assessing the oral ytflth of aged subjects //Am. J. Clin. Nutr. — 1989. — № 5. — P.1210—1218.
7. Long H. L., Miller W. A. Oral status and well-being of home delivered meal recipients // Gerontology. — 1994. — № 11/2. — P. 115—123.
8. Slade G. D., Locker D., Leake J. L. et al. The oral health status & treatment needs of adalts aged 65 living independently in Ottawa — Carleton // Can. J. Public Health. — 1990. — Vol.81. — № 2. — P. 114—119.
9. Leake J. L., Locker D., Price S. et al. Results of the socio-dental survey of people aged 50 and oider living in East York, Ontario // Can. J. Public. Health. 1990. — Vol. 81. — № 2. — P. 120—124.