

# The structure of dental patient first visit with the complaints that arise after prosthetics with removable and/or non-removable orthopedic structures

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## ABSTRACT

**Aim:** The article presents the analysis of the structure and reveals the main patterns of 1524 patient visits at the age of 30–80 years with the complaints that arise after the prosthetics with removable and/or permanent orthopedic structures. **Materials and Method:** The intolerance of prosthetic devices was found among 64% of patients in the sample under study, the intolerance of dental materials is revealed in 36% of cases (galvanosis - 15%, allergic stomatitis - 11%, toxic chemical stomatitis - 6%, and the combination of several types of intolerance to dental materials - 4%). The intolerance of dental materials is more often diagnosed among middle-aged women; the intolerance of prosthetic devices is diagnosed among the women of older age groups. **Result and Discussion:** A high incidence of comorbidity in the oral cavity organs and tissues are revealed among the sample patients. **Conclusion:** The patients with various types to dental material intolerance and the intolerance to prosthetic devices show different terms of main disease manifestation, the age intervals of primary appeal to a dentist, and comorbidity, which must be taken into account during the diagnosis, the treatment and the prevention of the main disease.

**KEY WORDS:** Allergic stomatitis, Burning mouth syndrome, Candida-associated denture stomatitis, Comorbidity, Intolerance of dental materials, Mouth toxic syndrome, The manifestation of a disease, Toxic chemical stomatitis

## INTRODUCTION

Due to a high level of the population need for orthopedic dental care, on the one hand, the increase of patient appeals number to dentists with various complaints after prosthetics, on the other hand, the urgency of studying the structure of dental patient treatment with the complaints that arise after prosthetics with removable and/or non-removable orthopedic constructions retains.<sup>[1]</sup>

They pay a lot of attention to the problem of interaction and mutual influence of prosthetic structures, dental materials, oral cavity tissues and organs, other systems and organs of a body.<sup>[2,3]</sup> It is known that the complications during the use of dental materials in a clinic of orthopedic and therapeutic dentistry can be caused by body

reactions caused by the action of metal and plastic alloy components.<sup>[4-6]</sup>

Dental materials can have a negative effect on a mucous membrane of the prosthetic bed and a human body, causing a complex of pathological changes, which is considered in literature as “the intolerance of dental materials,” “allergic stomatitis,” “toxic chemical stomatitis,” “toxic chemical stomatitis,” etc.<sup>[7,8]</sup>

Most diseases of tissues and oral cavity are characterized by polyethylicity.<sup>[9]</sup> It is difficult to determine a primary cause: The emergence of a common pathology in a body leading to the development of diseases in an oral cavity, or, on the contrary, the pathology of an oral cavity and the subsequent replacement therapy provoking the diseases of internal organs. It is known that in 60% of cases, dental patients have concomitant diseases of body organs and systems that must be taken into account during the diagnosis, the planning of complex

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treatment and for the prevention of complications. Very often, patients have comorbid conditions, which can include a variety of somatic pathologies, the combination of dental and somatic pathology, which is characterized by the effect of mutual burdening.<sup>[10,11]</sup>

Polyetiology, the variety of forms, clinical manifestations of intolerance, the complexity of pathogenesis, comorbidity, different terms of disease manifestation increase the urgency of finding the patterns concerning the patients' appeal to a dentist with complaints that arise after the prosthetics with removable and/or permanent orthopedic structures.

### Purpose of the Study

The analysis of the structure and the identification of the basic patterns of dental patient appeal with the complaints that arise after the prosthetics with removable and/or non-removable orthopedic structures.

## MATERIALS AND METHODS

A total of 1524 patients at the age of 30–80 years were under our supervision. They were sent from the state polyclinics, other medical institutions of the city of St. Petersburg, Leningrad region and applied independently for the consultation and diagnostic assistance to the Department of Orthopedic Dentistry of the Northwestern State Medical University named after I.I. Mechnikov. All patients had previously undergone orthopedic treatment to replace denture defects with prosthetic structures, which, from the patients' point of view, was the primary cause for the appearance of uncomfortable sensations and manifestations, both in the oral cavity and the body as a whole, and it was the reason to apply for a consultative-diagnostic help.<sup>[12]</sup>

## RESULTS OF THE STUDY AND DISCUSSION

All patients noted the appearance of subjective and objective manifestations in the oral cavity and the body as a whole after the prosthetics with removable and non-removable orthopedic structures.

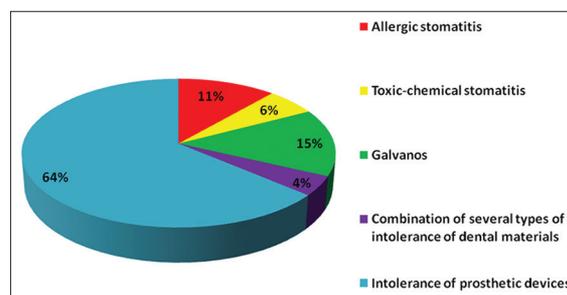
In 64% of cases, the cause of intolerance symptoms development was hidden not in the choice of dental material for a prosthesis production, not in the violation of a prosthesis making technology or in the interaction of a material with a body (the negative effect of dental material with allergic, toxic chemical, and electro-galvanic nature), and in adaptive capacity of organ and tissue reduction, the reduction of the metabolic capacity of a body, the depletion of general and local immune system resources, the presence of somatic pathology among patients, the break of

trophism, the presence of oral mucosa diseases, and the impact of psychological factors. The development of prosthetic device intolerance was also observed among the patients with low levels of oral hygiene and poorly manufactured dentures.

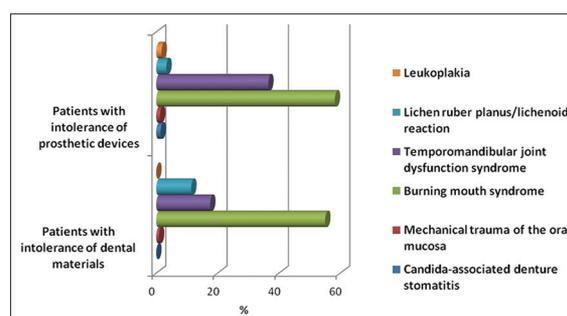
The intolerance of dental materials was revealed in 36% of cases among the patients of the studied sample. Galvanosis occurs most frequently; the second place is occupied by allergic stomatitis, the third place - toxic chemical stomatitis, the fourth place - the combination of several types of intolerance to dental materials [Figure 1].

The frequency of concomitant pathology and oral cavity organs and tissues detection among the patients of the sample under study is significant: It was revealed that the patients had the intolerance of dental materials in 88.3% of cases and in 93.1% of cases the patients had the intolerance of prosthetic devices [Figure 2].

The patients with the intolerance to dental materials and the intolerance to prosthetic devices had the burning mouth syndrome as the leading concomitant disease (55.1% and 58.2%, respectively). In comparison with persons suffering from the intolerance to dental materials, the patients with the intolerance of prosthetic devices had the temporomandibular joint dysfunction syndrome ( $P < 0.001$ ) more often. On the average, one patient with the intolerance to prosthetic devices accounted for  $1.9 \pm 0.03$  of oral cavity tissue and organ diseases, while one examined



**Figure 1:** Frequency of different types of intolerance detection among the patients of the sample



**Figure 2:** Concomitant pathology of oral cavity organs and tissues among the patients of the sample under study

patient with the intolerance of dental materials had  $1.09 \pm 0.02$  ( $P < 0.001$ ), which, of course, negatively affects the adaptation to prosthetic structures and can cause the complaints among the patients with the intolerance to prosthetic devices. A reliable positive correlation was found between burning mouth syndrome and the intolerance of prosthetic devices ( $r = 0.712$ ,  $P < 0.05$ ).

The sample under study is characterized by considerable variability and unequal age distribution. The age of primary dental patients with toxic chemical stomatitis is in the range of 39–80 years, galvanosis - 36–80 years, allergic stomatitis - 30–75 years, and the combination of several types of intolerance to dental materials - 42–73 years. The average duration of toxic chemical stomatitis symptoms in the oral cavity is in the range of 4–7 days, galvanosis - 3–6 months, allergic stomatitis and the combination of several types of intolerance to dental materials - from 4 to 7 days [Figure 3].

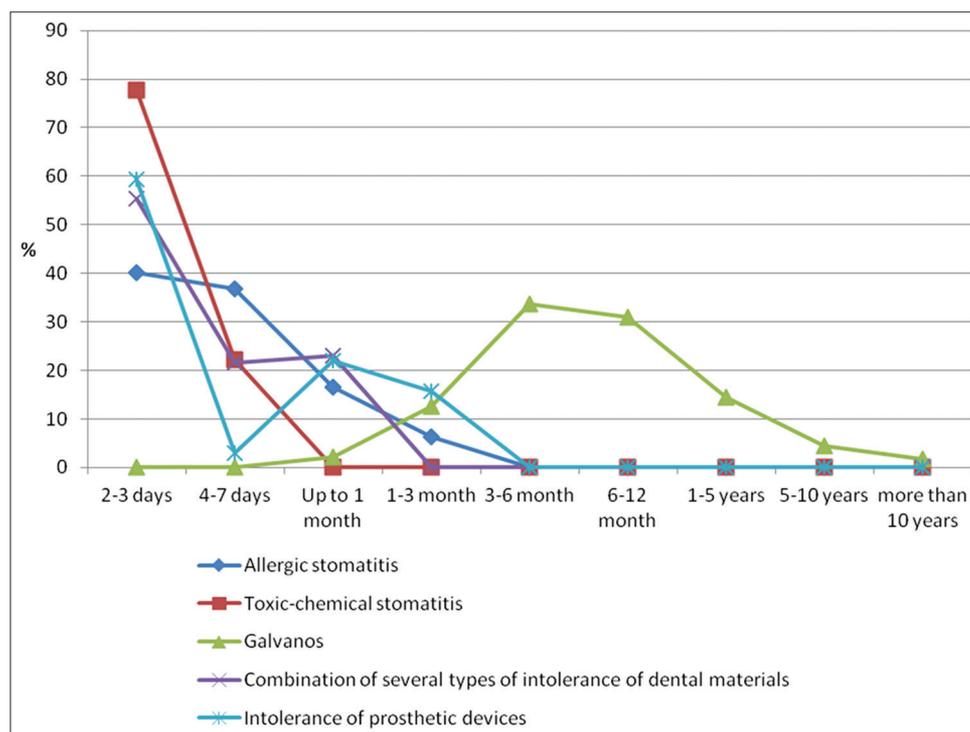
The age of the patients with the intolerance to prosthetic devices differs by less spread - from 42 to 80 years. The average time of complaint occurrence among the patients with the intolerance to prosthetic devices makes 2–3 days after prosthetics (57.8% of clinical cases). There were no significant gender differences between the groups of patients with allergic stomatitis, galvanosis, toxic chemical stomatitis, the combination of several types of intolerance of dental materials, and the intolerance to prosthetic devices ( $P > 0.05$ ).

Female patients predominated (90.2%) in the sample under study. It should be noted that the intolerance of dental materials is more often diagnosed among middle-aged women, while a sharp increase of prosthetic device intolerance frequency is observed among the women of older age groups.

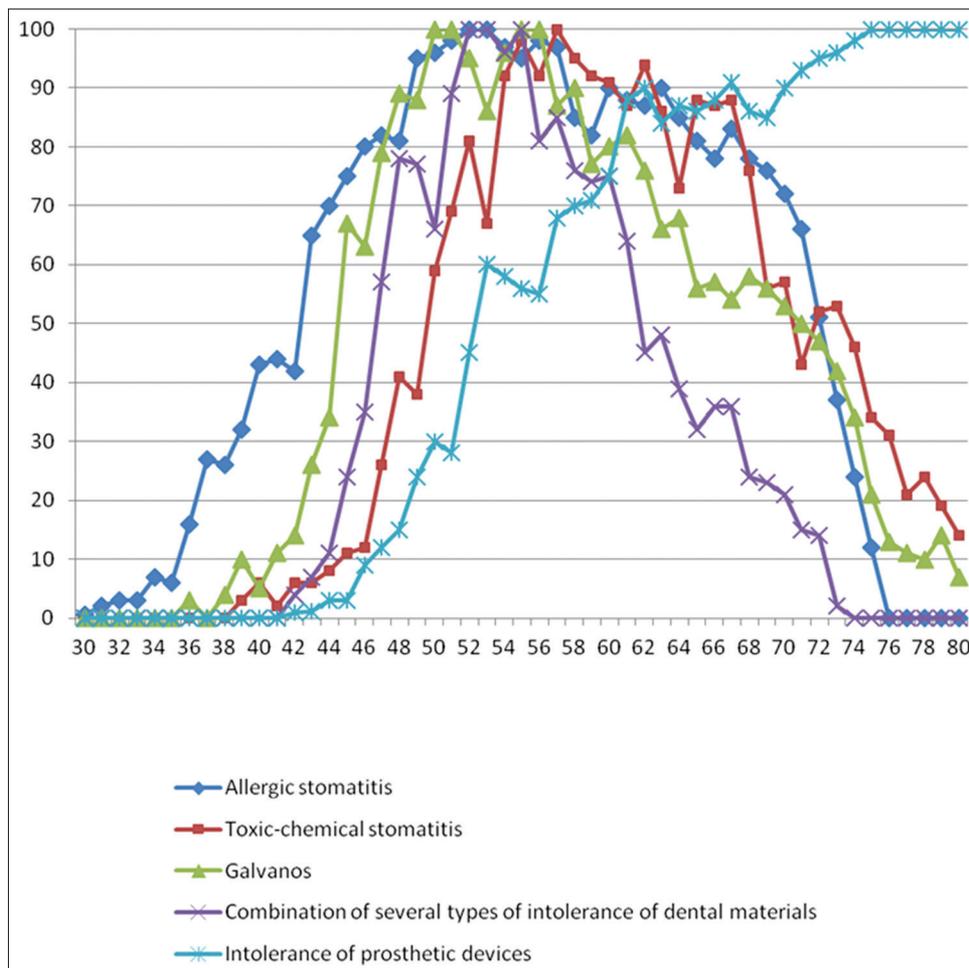
The differences in the pattern of dental patient primary visit distribution with the complaints arising after prosthetics relative to the age of the examined ones are shown in Figure 4.

The samples of patients with allergic stomatitis, galvanosis, toxic chemical stomatitis, and the combination of several types of intolerance of dental materials differ from the sample with the intolerance of prosthetic devices ( $P < 0.004$ ): Characterized by unequal distribution by age.

The distribution graph by age at the initial reference to a dentist by the patients with various types of intolerance to dental materials has the form of a parabola with the peak corresponding to the maximum values among middle-aged people who predominate in the pattern of visits: Allergic stomatitis - 50–57 years, galvanosis - 54–58 years, toxic chemical stomatitis - 55–59 years, and the combination of several types of intolerance to dental materials - 52–55 years. The age distribution graph among the patients with the intolerance to prosthetic devices is an upward curve ending by a plateau at maximum values among senile patients.



**Figure 3:** Terms of dental patients first appeals with the complaints that arise after prosthetics



**Figure 4:** Distribution of primary dental patients by age. By vertical - the number of primary visits (%), by horizontal - the age of primary patients (years)

It is known that during the life of a person there is a gradual adaptation to the changing conditions of the dental-alveolar system functioning: The loss of teeth occurs, age-related changes in the mucous membrane of a mouth, other organs and tissues of an oral cavity take place. The level of individual tolerance to prostheses and dental materials is a variable value, changing under the influence of common diseases, hormonal changes, and aging processes.

All the patients of the sample under study showed comorbid diseases in a variety of combinations. All studied dental patients differ in comorbidity. An average number of concomitant diseases per person among the patients with the allergy to dental materials (in all age groups) and the combination of several types of intolerance to dental materials (young, middle-aged, and elderly persons) is significantly higher than the rates of the patients with galvanose and toxic chemical stomatitis ( $P < 0.001$ ). Maximum values for the patients with different types of dental materials intolerance and the intolerance to prosthetic devices is achieved in the older age groups (among elderly patients with allergic

stomatitis allergic stomatitis -  $7.44 \pm 0.63$ , toxic chemical stomatitis -  $5.36 \pm 0.64$ , galvanos -  $4.03 \pm 0.54$ , the combination of several types of intolerance to dental materials -  $7.03 \pm 0.56$ , and the intolerance of prosthetic devices -  $7.65 \pm 0.44$ ).

The correlation analysis revealed the presence of a reliable relationship between comorbidity and the probability of intolerance to prosthetic devices ( $r = 0.715$ ,  $P < 0.01$ ), the age and the probability of intolerance to prosthetic devices ( $r = 0.703$ ,  $P < 0.05$ ). The patients with allergic stomatitis and the combination of several types of intolerance to dental materials demonstrate a direct correlation between comorbidity and the probability of dental materials intolerance ( $r = 0.614$ ,  $P < 0.01$ ).

## CONCLUSIONS

Thus, the decrease due to age changes in adaptive mechanisms, on the one hand, the introduction of a poor-quality prosthesis in an oral cavity, the errors in the technology of a prosthetic structure manufacture, the violation of the conditions for the functioning of

the prosthesis in an oral cavity, on the other hand, explain the distribution of primary dental patient treatment with the complaints, arisen after the prosthesis with removable and/or non-removable orthopedic structures.<sup>[13,14]</sup>

The patients of the sample under study with different types of dental material intolerance and the intolerance of prosthetic devices demonstrate different terms of a main disease manifestation, the age intervals of a primary appeal to a dentist, comorbidity, which must be taken into account during the diagnosis, the treatment and the prevention of a primary disease.

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