



INTEGRATION OF CLINICAL QUALITY CONTROL AND NUMERICAL STRESS ANALYSIS AT THE CROWN-IMPLANT INTERFACE IN ORTHOPEDIC DENTISTRY

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Abstract

According to the legal definition of the quality of medical care, one of the evaluation criteria is the degree to which the planned treatment outcome has been achieved. Analysis of court cases in dentistry shows that in 40% of cases, there are claims regarding the quality of orthopedic dental care and its results. The increase in the number of adverse treatment outcomes considered in courts is largely due not to the low quality of dental prosthetics, but to the lack of communication skills among dentists, their inability to achieve patient compliance, active involvement of the legal community, opportunities for financial gain, and the peculiarities of modern cultural coding, which leads to the dominance of patient rights while dentists have low legal literacy. Focusing on the clinical aspects of treatment, dentists insufficiently utilize the potential of a risk-oriented approach in organizing their work to prevent the emergence and development of conflict situations, which provokes locally contained conflicts to escalate to the level of court proceedings. According to research data, more than 67% of patients' claims regarding the quality of orthopedic treatment are recognized by courts as justified.

The purpose of the study is to determine methods and means for managing the quality of orthopedic dental care, including the use of a risk-oriented approach in organizing the treatment process and preventing conflict situations, taking into account the causes of adverse treatment outcomes.

Materials and methods. Within the framework of this goal, a systematic analysis of the main causes of conflict situations that led to legal proceedings was conducted to determine the most effective general and specific management measures. During





the study, the main risks in the work of a dentist-orthopedist were identified to determine measures for their prevention. Analysis of adverse outcomes of orthopedic treatment was carried out using statistical methods based on the conclusions of 692 forensic medical examinations (FME) for the period 2013-2022.

Results

During the study of forensic medical examination (SME) reports, 1216 orthopedic structures were evaluated, including 938 fixed dental prostheses and 278 removable prostheses. In total, in 692 SMEs (from 2013-2022) that considered the quality of orthopedic treatment, more than 2812 main (most significant) complaints from patients against dentist-orthopedists were recorded. These complaints were assessed for the presence and severity of errors and treatment complications, the validity of patient complaints, and cause-effect relationships between defects and the treatment provided. Based on these complaints, questions were formulated for experts. As expected, the most frequent complaint (in 530 SME cases) was pain after poor-quality orthopedic treatment (in the temporomandibular joint, under prostheses, in abutment teeth, etc.). Additionally, dental orthopedic treatment was assessed taking into account complaints:

- about low quality of prosthesis manufacturing (poor marginal fit of crowns, incorrect borders of removable dentures, incorrect modeling of cleansable space, etc.) - 519 cases;
- about incorrect restoration of bite and occlusal relationships - 365 cases;
- about the impossibility of using prostheses due to rapid loss of supporting teeth - 312 cases;
- about unsatisfactory fixation of removable and fixed dentures (frequent decementation of crowns) - 307 SME cases;
- for treatment that did not correspond to the diagnosis: the diagnosis was not substantiated in the medical record by clinical data and additional objective examination methods (radiological) - 257 cases of FME;
- for incorrect planning of orthopedic treatment (using an insufficient number of abutment teeth for a fixed prosthesis, incorrect choice of treatment method or type of prosthesis) - 95 FME;
- for prosthesis breakage during the warranty period - 94 FME;
- for violations in the technology and methodology of prosthesis fabrication (absence of necessary treatment stages, excessive taper during tooth preparation) - 89 FME;
- for incorrect preparation of abutment teeth (poor endodontic preparation, use of vital teeth or, conversely, unjustified pulp removal) - 82 FME;





- for unsatisfactory appearance of prostheses - 59 FME;
- for failure to provide or provision of false information (about the types of implants used, prosthesis materials) - 58 FME;
- for the development of intolerance symptoms or allergic reactions, galvanic syndrome related to dental prostheses - 45 FME.

Thus, the study determined that in every second judicial case on orthopedic dentistry, there were accusations of incorrect treatment planning or conducting an unjustified volume of treatment. This necessitates more thorough documentation of primary examination data, diagnosis justification, and treatment method selection in medical records. The study revealed a significant number of complaints regarding the obtained treatment results, the quality and service life of orthopedic structures, and violations of prosthetic technology and methods. When properly organizing dental care, it is necessary to implement mechanisms that allow for objectifying the achieved treatment results and demonstrably showing patients compliance with rules, methods, and standards.

Among the specific features of forensic medical examination in dentistry, one can note a significant number of cases where the patient underwent treatment stages in different clinics, or treatment methods were used for which there are no evaluation criteria in clinical guidelines (for example, when using basal implants or in cases of temporomandibular joint dysfunction). In addition, many court cases have been initiated due to unresolved issues regarding the service life and warranty periods for orthopedic structures.

Conclusion

1. Among the general management measures applicable to the entire clinic's operations, it is crucial to make forward-looking decisions considering the specific nature of the dental organization's work. For example, such decisions may involve operating within the framework of medical tourism or utilizing new technologies for which evaluation criteria are not included in approved clinical guidelines.
2. It is essential to ensure organizational and legal regulation of all treatment stages, beginning with the contract for paid services, informed voluntary consent for treatment, and warranty provisions, and concluding with feedback on patient satisfaction regarding treatment outcomes. Furthermore, it is important to use socio-psychological methods to foster a positive workplace atmosphere that facilitates the resolution of conflicts at early stages, before irreconcilable contradictions develop between parties.





3. The most effective specific measures for managing the quality of dental orthopedic care can be identified as the digitalization of management functions for planning, organizing, and monitoring treatment processes, as well as the preparation of medical documentation in accordance with legislative and regulatory requirements in the form of templates, standardized operating procedures, algorithms, protocols, etc. Digital methods enable rapid implementation in practice and objective monitoring of doctors' knowledge and adherence to all rules.

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