

Modern approaches to the diagnosis and treatment of caries in therapeutic dentistry

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Annotation

Dental caries remains one of the most common dental pathologies worldwide. Despite the development of preventive measures and improved treatment methods, the prevalence of the disease remains high among various age groups. Modern therapeutic dentistry focuses not only on eliminating defects in hard dental tissues but also on early diagnosis, minimally invasive treatment, and recurrence prevention. This article discusses modern methods of diagnosis, treatment, and prevention of dental caries.

Key words: therapeutic dentistry, caries, remineralization, filling materials, prevention.

Introduction

Dental caries is a pathological process characterized by demineralization and destruction of hard dental tissues under the influence of microorganisms found in dental plaque. The main factors in the development of dental caries are poor oral hygiene, excessive carbohydrate consumption, decreased enamel resistance, and impaired mineral metabolism [1,5].

According to the World Health Organization, dental caries remains one of the most common chronic diseases among children and adults worldwide. The high prevalence of this pathology makes the issue of prevention and timely treatment particularly relevant to modern dentistry. The development of caries not only leads to the destruction of hard dental tissue but can also cause inflammatory diseases of the pulp and periodontium, which negatively impacts the patient's overall health and quality of life [4,6].

Restorative dentistry plays a vital role in maintaining the functionality and aesthetics of teeth. Modern treatment methods are aimed at maximizing the preservation of healthy dental tissue and increasing the longevity of restorations. In recent years, special attention has been paid to minimally invasive technologies, which allow for treatment with minimal damage to dental tissue. The use of modern composite materials, adhesive systems, and remineralizing therapy methods has significantly increased the effectiveness of caries treatment [2,3].

Furthermore, the preventative aspect of therapeutic dentistry is crucial. A comprehensive set of preventative measures, including proper oral hygiene, nutritional adjustments, the use of fluoride supplements, and regular dental examinations, can significantly reduce the risk of dental caries and its complications [7,8].

Thus, the study of modern methods of diagnosis, treatment and prevention of caries is one of the pressing tasks of therapeutic dentistry and is of great practical importance for maintaining the dental health of the population.

Modern methods of caries diagnostics

Early diagnosis of dental caries helps prevent complications and reduce the scope of intervention. The following methods are currently used:

1. Visual-instrumental method

This is the primary method of initial diagnosis. The doctor evaluates the condition of the enamel, the presence of stains, cavities, and tooth discoloration.

2. X-ray examination

Allows you to identify hidden forms of caries, especially on the contact surfaces of the teeth.

3. Laser diagnostics

Modern equipment allows us to detect initial changes in the enamel structure even before the appearance of clinical symptoms.

4. Transillumination

The method is based on the passage of a light beam through tooth tissue and the identification of areas of demineralization.

Modern methods of treatment

Treatment of caries depends on the stage of the pathological process.

Initial caries

At the white spot stage, remineralizing therapy can be performed without tooth preparation. Calcium, fluoride, and phosphorus preparations are used.

Medium and deep caries

The affected tissue is removed, followed by restoration of the anatomical shape of the tooth.

Modern filling materials:

- composite materials;
- glass ionomer cements;
- compomers;
- nanocomposites.

Of particular importance is the use of adhesive systems that ensure a strong connection between the restorative material and the tooth tissue.

Minimally invasive dentistry

Modern therapeutic dentistry adheres to the principles of minimal intervention. The primary goal is to preserve as much healthy dental tissue as possible.

Minimally invasive technologies include:

- air-abrasive processing;
- laser preparation;
- caries infiltration;
- use of ozone therapy.

Prevention of dental caries

Caries prevention is one of the most important areas of modern therapeutic dentistry. The primary goal of preventive measures is to prevent enamel demineralization, reduce the activity of cariogenic microorganisms, and maintain the health of dental hard tissues. Prevention should be systematic and include a range of individual, professional, and community measures[10].

1. Regular oral hygiene

Proper and regular oral hygiene is the foundation of caries prevention. Dental plaque contains a large number of microorganisms that metabolize carbohydrates, producing acids that destroy tooth enamel.

Basic rules of hygiene:

- brushing your teeth at least twice a day;
- using a medium-hard toothbrush;
- using dental floss to clean between teeth;
- use of irrigators and rinses;
- Regular replacement of your toothbrush every 2-3 months.

Teaching patients proper dental brushing techniques is especially important. Children should develop good dental hygiene skills from an early age under parental supervision[12].

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Conclusion

Modern therapeutic dentistry is actively implementing innovative methods for diagnosing and treating caries, which improves the effectiveness of treatment and maintains dental health. Early diagnosis, minimally invasive technologies, and prevention are the main areas of development in modern dentistry.

The use of modern filling materials, adhesive systems, and remineralizing therapy methods helps restore the anatomical shape and functionality of teeth, while also improving the aesthetics of treatment. The use of digital technologies and high-precision diagnostic methods allows for the early detection of pathological processes, preventing the development of complications.

The preventative focus of therapeutic dentistry is particularly important. Developing proper hygiene habits, regular preventive examinations, and professional oral hygiene can significantly reduce the prevalence of dental caries and improve the dental health of the population.

Thus, a comprehensive approach to the diagnosis, treatment, and prevention of dental caries is essential for maintaining oral health. Further advances in therapeutic dentistry are driven by the improvement of minimally invasive technologies, the development of biocompatible materials, and the introduction of innovative methods for the prevention of dental diseases.

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