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Clinical and Morphological Features of the State of the Dentoalveolar System in Patients with Increased Parathyroid Function Features of Providing Dental Care

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ABSTRACT: Changes in the functions of the endocrine glands lead to metabolic disorders in the body, and a number of trophic disorders. Changes in the oral cavity are detected with a dysfunction of the genital, thyroid and parathyroid glands, hypothalamic-pituitary system.The earliest symptoms of primary hyperparathyroidism are minor and are associated with a change in the condition of many organs, so it is very difficult to determine the time of onset of the disease. Numerous symptoms of this disease depend on hypercalcemia, increased excretion of calcium and phosphorus in the urine, are associated with changes in the skeleton and metastatic calcifications in the soft tissues.

Keywords: parathyroid gland; osteoporosis; calcium-phosphorus metabolism; enamel ultrastructure; mineralization; caries resistance.

Introduction

Hyperfunction of the parathyroid gland-Hyperparathyroidism (Recklinghausen's disease) - a disease based on the hyperproduction of parathyroid hormone caused by adenoma or hyperplasia of the parathyroid glands. There is leaching of calcium and phosphorus from the bones, which leads to osteoporosis, cystic bone rearrangement, replacement of bone tissue with fibrous, and the occurrence of fractures.

In most patients, hyperparathyroidism occurs due to the development of one or more parathyroid adenomas (in 80 — 90% of cases); the disease is observed at any age, but most often in patients 30 — 50 years. Accordingtostatisticaldata, thisdiseaseismorecommoninwomen [MilkuSh., 1992; Tarkaeva V. N., 1998, etal.].

All of the above naturally contributes to the appearance of anomalies in the shape of the dentition and bite, which is reflected in the violation of the face configuration (disproportionate development) and the functions of the maxillofacial region. In hyperparathyroidism, odontology develops, which is associated with hypocalcemia and the development of spastic syndrome, which are characteristic of parathyroid gland dysfunction.

As a consequence - the pain in the teeth, the reduction of the jaws, tongue numbness. From the side of the mucous membrane of the oral cavity with hyperparathyroidism, endemicity, swelling of the mucous membrane, the lining of the tongue, and taste disturbance are determined. The mucous membrane of the gums is often pale, shiny, hyperplastic, but not inflamed.

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The aim of the work is to study clinical and morphological changes in the dentition in the control of hyperparathyroidism using scanning electron microscopy of teeth chips.

Materials and Methods

The clinical examination was carried out in the Department of Endocrine Surgery of the Research Institute of Endocrinology, Ministry of Health of the Republic of Uzbekistan. Complaints of patients, objective, endocrinological status were assessed. Based on the clinical data obtained, a preliminary diagnosis was made, which was confirmed by laboratory tests.

All patients were divided into groups and were randomized according to age, sex, frequency of somatic pathology, which made it possible to objectively evaluate the results of clinical and biochemical studies.

The prevalence of dental carious lesions among women 20-55 years old with hyperparathyroidism is 2 times higher than among healthy people (E.T.Supieva, 1996) Women with hyperparathyroidism have a higher frequency of periodontal diseases (61.1%) than healthy (18.7%) (E.T.Supieva, 1996). Moreover, chronic catarrhal gingivitis is more common (in 43.6%), somewhat less often - hypertrophic (in 12.4% of cases). In men, dystrophic processes predominate in the periodontium - atrophy of the interdental papillae, gaping of the necks of the teeth, while their mobility is absent. [5,7,11] Less often, inflammatory-dystrophic changes develop, characterized by the presence of periodontal pockets with serous and hemorrhagic contents, inflammation of the papillae, teeth mobility.

In conditions of hyperfunction of the parathyroid glands, a decrease in caries resistance of tooth enamel (according to the data of the Cardiac Resynchronization Therapy-test and TER-test), microhardness of the enamel and dentin of the teeth was noted. Hyposalivation, a decrease in the level of lysozyme in mixed saliva is characteristic. The mineralizing function of saliva, as a rule, is low, which is manifested in a decrease in the mineralizing potential of saliva, the concentration of mineral components in saliva, tartar and dental plaque.

Sometimes, along with the processes of bone resorption, their repair is visible on radiographs; the bone thickens and becomes like cotton wool. The characteristic biochemical changes in the blood in hyperparathyroidism are reduced to an increase in the content of calcium in the blood, reaching in some cases to extremely high figures of 24-30 mg% (on average, it is equal to 13-17 mg%).

Results and discussion

Hyperparathyroidism is characterized by higher values of the prevalence and intensity of dental caries compared to healthy ones. The course of caries has characteristic signs: "multiple" caries, a high frequency of complicated caries, permanent teeth are destroyed very quickly, but persist for a long time in the form of roots; acute course of the process, especially in the acute stage of the underlying disease; frequent lesions of the cervical region of the teeth with the circular spread. [8,11,13]

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On the radiograph: the obliteration of the tooth cavity, canals, more in the apex. There is enamel hypoplasia, discolouration of the teeth: yellow-grey, greenish, grey. In women from non-carious lesions, pathological abrasion of teeth, erosion of hard tissues, necrosis, and enamel cracks are more common.

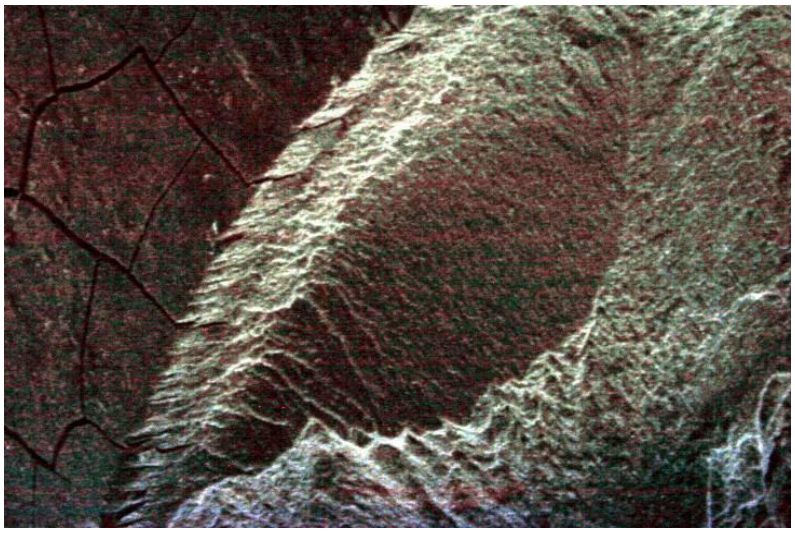

Figure. 1 Cracks on the enamel surface. Hyperparathyroidism. SEMx100

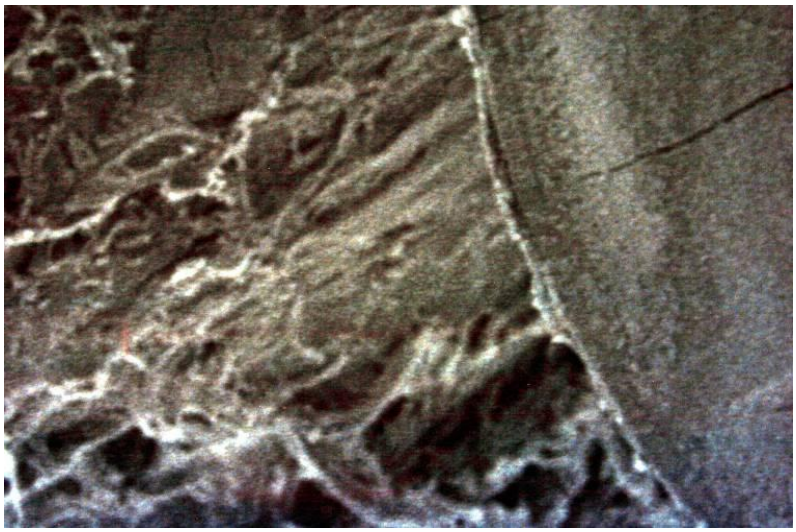

Figure: 2. Polymorphism of bundles of enamel prisms, cracks and erosion on the enamel surface. Hyperparathyroidism SEM x 600

Characteristic violation of the shape of the crowns of the teeth: small teeth, atypical shape, incisors are with teeth on the cutting edge, canines and molars can have the shape of incisors, the crowns of the teeth are shortened, sometimes the teeth are "doubled" (fused rudiments). Hyperparathyroidism is almost always characterized by the crowding of the teeth, position outside the arch, rotation around the axis. Due to the delay in resorption of the roots of milk teeth and retention of permanent teeth, "double" rows of teeth, diastemas are often described, both an overcomplete and an

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insufficient number of teeth are observed, although hypodontia, up to adentia, is more common, and very rarely there is a normal number of teeth. [1,5,6]

A change in the enamel ultrastructure in hyperparathyroidism was a revealed-a decrease in the microhardness of dentin, enamel prisms stretch and change their orientation.

Figure. 3 Polymorphism of dentinal tubules, the proliferation of fibrous substance. Hyperparathyroidism. SEM x 1000.

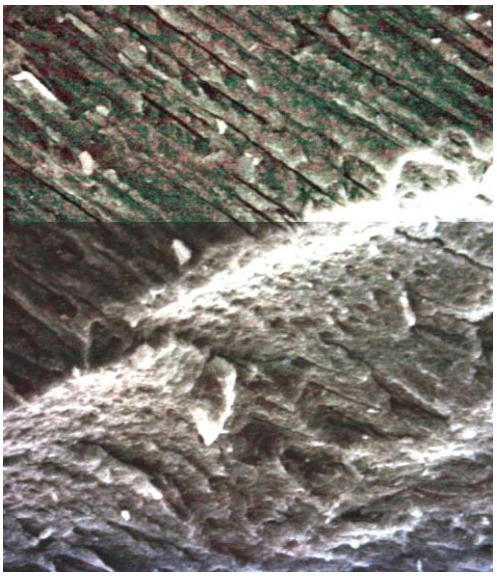

Figure. 4. Polymorphism of dentinal tubules, their desolation, the proliferation of fibrous substance.

Hyperparathyroidism. SEM x 1000. Frequency of periodontal diseases with hyperfunction The parathyroid glands, as a rule, do not go beyond the usual, but the activity of degenerative processes in the periodontium depends on the activity and duration of the underlying disease. An increase in the synthesis of parathyroid hormone, especially at puberty, can contribute to an increase in proliferative processes and, as a result, lead to hypertrophic gingivitis. Increased mobility and

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displacement of teeth without the visible formation of periodontal pockets, malocclusion, calcification of soft tissues, periapical radiolucency and root resorption, loss of the cortical plate and general loss of bone radiopacity [2,6,9].

The purpose of the treatment is to carry out measures aimed at increasing the mineralization of hard tissues of the teeth and performing restoration work. Replenish the anatomical integrity and full-fledged chewing function of damaged teeth, achieve, if possible, stop the pathological process, or transfer the disease to a compensated stage - the stage of rest (stabilization or remission), improve the general condition of the whole organism. Thetreatmentpackageincludeslocalandgeneralevents.

General treatment of all carious, non-carious lesions of the teeth is aimed at increasing the body's resistance and strengthening the hard tissues of the teeth. For this purpose, preparations of a complex of vitamins (C, A, E, B1, B6) are prescribed, as well as dosage forms of micro- and macroelements (Ca, Mg, Zn, etc.) in combination with vitamin D3.

Correct the diet to fill it with foods high in essential vitamins and minerals.It is recommended to eat seafood and especially seaweed (kelp seaweed). The diet should also be balanced in protein, fat and carbohydrate content to optimize calcium metabolism.Women with erosions, wedge-shaped defects and increased tooth wear after examination by specialists (gynaecologist, endocrinologist), if necessary, are prescribed therapy to normalize hormonal levels and treat concomitant pathology.

Local treatment largely depends on the nosological form of non-carious lesions and the stage of the disease, however, in all cases, it is recommended to start with local remineralizing therapy. In the acute phase of the disease and the stage of exacerbation, local remineralizing therapy is especially relevant, it increases their mineral density. To increase the mineralization of hard dental tissues, calcium and fluorine-containing solutions, gels and pastes are used. They are used for applications on teeth with the passive introduction of microelements, or as a substance for the active introduction of calcium and fluorine by electrophoresis.

In addition to calcium and fluoride preparations, potassium salts (potassium chloride, potassium citrate, potassium nitrate), strontium, and oxalates, which have a desensitizing effect, are used to reduce tooth hyperesthesia (dentin). In addition, they promote the obturation of the dentine tubules and stimulate the formation of secondary dentin. In recent years, low-level laser therapy has been successfully used to relieve pain and hypersensitivity of dental tissues.

Conclusion

1. When examining patients with changes in the oral cavity, it is rational to use a single methodological approach to assessing the severity of the disease using the developed indexes: periodontal index PI according to Rusel, index of oral hygiene Green S., Vermillion T., Electro-dental diagnostics (EDI) – a method of dental research based on determining the threshold excitation of pain and tactile receptors of the tooth pulp when an electric current passes through it, electron microscopy of hard tooth tissues.This method has shown effectiveness in the examination of patients with hyperparathyroidism.

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2. Examination of patients with carious and non-carious lesions of the teeth must be carried out in conjunction with a gynaecologist, endocrinologist, radiologist. The examination algorithm should include: hormonal parameters (estradiol, parathyroid hormone, cortisol, blood Ca (ionized), urine Ca, blood magnesium, P-blood.

3. The studies carried out convincingly show that patients with hyperparathyroidism have metabolic disorders of bone tissue, leading to the development of osteopenia. Therefore, it is advisable to refer them to the risk group for the development of osteoporosis and it is advisable to prescribe complex preparations containing calcium, magnesium salts and the active form of the vitamin. The question of correcting hormonal and metabolic disorders should be addressed by specialized specialists.

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