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FOLLICULAR CYSTS AND KERATOCYSTS: MODERN APPROACHES TO DIAGNOSIS AND TREATMENT

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Abstract:
The article extensively discusses the etiology, clinical signs, diagnostic methods, and modern approaches to treatment of follicular cysts and keratocysts, among odontogenic cysts encountered in maxillofacial surgery. Follicular cysts are usually benign and rarely recur, while keratocysts are characterized by aggressive growth and high recurrence rates. Methods such as curettage and resection are used in surgical practice. Modern technologies — CBCT, laser, endoscopic surgery, cryotherapy, and the use of biomaterials — play an important role in increasing the effectiveness of treatment.

Keywords: Maxillofacial surgery, follicular cyst, keratocyst, odontogenic cyst, diagnosis, treatment, CBCT, laser surgery, biomaterials, cryotherapy.

Introduction

Purpose of the work: The purpose of this work is to analyze the etiology, clinical symptoms, diagnostic methods and modern approaches to treatment of follicular cysts and keratocysts encountered in maxillofacial surgery. Also, to show ways to increase the effectiveness of treatment and reduce the likelihood of recurrence by combining classical surgical procedures with innovative technologies.

Maxillofacial surgery is one of the important branches of dentistry and general surgery, studying pathological processes occurring in the oral cavity, jaw bones and temporomandibular joint. This field is aimed not only at treating diseases, but also at restoring the patient's appearance, speech and psychological state. Odontogenic cysts are pathological cavities arising from tooth development or epithelial remnants, which are often encountered in clinical practice. Among them, follicular cysts and keratocysts are the most common and clinically significant diseases. Follicular cysts usually grow slowly and cause aesthetic and functional problems. Keratocysts, on the other hand, have an epithelial origin and are characterized by aggressive growth and a high recurrence rate. Therefore, keratocysts are one of the most clinically complex pathologies. In recent years, modern technologies have been widely introduced in diagnostics and treatment. The use of computed tomography (CBCT), laser surgery, endoscopic methods, cryotherapy, and biomaterials is facilitating the rehabilitation process for patients and increasing the effectiveness of treatment.

Main Part

1. Follicular cyst. Follicular cyst arises from epithelial remnants in the dental follicle. During tooth development, a cyst is formed as a result of the accumulation of fluid, forming an epithelial cavity. This process is often associated with delayed or stopped tooth eruption. Inflammatory processes also play an important role in the pathogenesis. Most often occurs in the molar region of the lower jaw. Tooth eruption is delayed or stopped. It causes swelling, pain and deformation on the face. Large cysts expand the bone and disrupt facial symmetry. Sometimes patients present with aesthetic complaints. Diagnosis. Panoramic radiograph: a cavity with fluid accumulation around the tooth crown is visible. CBCT: the size, boundaries and relationship of the cyst to the bone are clearly assessed. Histology: the epithelial lining is determined, the degree of inflammation is assessed. Treatment. Enucleation: complete removal of the cyst. Marsupialization: to reduce pressure in large cysts and accelerate bone regeneration. Biomaterials: to repair bone defects using collagen membranes, osteoplastic preparations. Laser surgery: to reduce bleeding and ensure faster healing.

2. Keratocyst. Keratocyst develops from the remnants of the odontogenic epithelium. As a result of the production of keratin by the epithelium, the cyst wall becomes strong, which causes its aggressive growth. It is often associated with genetic factors and is often found in Gorlin-Goltz syndrome. Clinical signs. Occurs in the posterior part of the lower jaw. May be asymptomatic for a long time. Later, swelling, pain, and tooth displacement are observed. In large volumes, it erodes bone extensively. Speech and chewing function may be impaired. Diagnosis. Radiology: an enlarged cavity is visible in the bone. CBCT: the size and boundaries of the cyst are clearly assessed. Histology: keratin-forming epithelium is detected. Immunohistochemistry: shows a high degree of proliferation. Treatment. Curettage: simple removal is not enough, the likelihood of recurrence is high. Resection:

used for large and aggressive cysts. Cryotherapy: treatment of the cyst wall with liquid nitrogen, reduces recurrence. Laser surgery: minimally invasive, allows for faster healing. Biomaterials: collagen membranes and osteoplastic preparations to fill the bone defect.

3. Modern approaches. Diagnostics. CBCT (Cone Beam CT): clearly shows the size, boundaries and relationship of the cyst to the bone. 3D planning: allows for the creation of a virtual model before surgery and precise planning of surgery. Immunohistochemistry: assesses the aggressiveness of keratocysts by determining the degree of epithelial proliferation.

Surgical methods. Laser surgery: minimally invasive, reduces bleeding, allows for faster healing. Endoscopic surgery: removal of the cyst through small incisions, less traumatic for the patient. Cryotherapy: treatment of the cyst wall with liquid nitrogen, reduces the likelihood of recurrence. Robotic surgery: with high accuracy in complex cases.

4. Comparison. Follicular cysts usually grow slowly, are less aggressive and have a low probability of recurrence. They cause more aesthetic and functional problems. Keratocysts, on the other hand, have an epithelial origin, grow rapidly, erode bone extensively and have a high probability of recurrence. Therefore, keratocysts are clinically more dangerous and require a more extensive surgical approach and long-term follow-up.

Results

Follicular cysts are usually benign and have a very low recurrence rate after treatment. Keratocysts are clinically more dangerous and have a high recurrence rate (30–60%). Modern diagnostic methods (CBCT, 3D planning) allow for accurate diagnosis of cysts. Laser and endoscopic surgery are less traumatic for the patient and accelerate the recovery process. The use of cryotherapy and biomaterials reduces the risk of recurrence and accelerates bone regeneration.

Conclusion

Follicular cysts and keratocysts remain an urgent problem in maxillofacial surgery. While follicular cysts cause more aesthetic and functional problems, keratocysts are clinically more dangerous and have a high probability of recurrence. Therefore, a more extensive surgical approach and long-term follow-up are necessary for keratocysts. Modern diagnostic methods — CBCT, 3D planning and immunohistochemical studies — allow for accurate diagnosis of cysts. In addition to classical surgical methods (curettage, resection), the use of laser surgery, endoscopic operations, cryotherapy and biomaterials in treatment increases efficiency. In particular, in keratocysts, a more extensive surgical approach and long-term follow-up are necessary to reduce the likelihood of recurrence. In general, the study and treatment of follicular cysts and keratocysts remains an urgent problem in maxillofacial surgery. Their early diagnosis, the use of modern technologies and the enrichment of clinical experience with scientific research will help to effectively control these diseases.

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