

GINGIVAL CYSTS OF ADULTS. DEBATABLE ISSUES OF DEVELOPMENT AND A CLINICAL CASE

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Abstract

Purpose: to analyze data on the origin and pathohistological features of gingival cysts in adults. **Research methods.** The design of this study was formulated as a retrospective review of the literature with the analysis of target scientific works and personal observation data. **Scientific novelty.** Gingival cysts of adults are a debatable topic, considering the age period of the appearance of pathology, prevalence, localization, depth of location, histological structure, origin and possibility of combination with lateral periodontal, botryoid cysts. **Conclusions.** The variety of theories on the origin of gingival cysts in adults and the similar histogenesis with lateral periodontal cysts make it difficult to verify pathological formation. Diagnosis of this type of cyst can be carried out on the basis of the clinical and radiological picture of the lesion. Histological identification of GCA is difficult, due to the possible absence of an epithelial lining, and if present, its diversity or ultra-thin structure.

Keywords: cyst, gingival cyst, jaw, dental plate, islets of Malyasse, epithelial cyst lining, surgical interventions for jaw cysts, cystectomy.

1. INTRODUCTION

Diagnosis of intraosseous cysts and tumors of the jaws is one of the difficult problems of maxillofacial surgery. The diagnosis, as a rule, is established on the basis of clinical and radiological data and only after removal of the pathological formation - histologically. It is worth noting that even histological examination in many cases does not allow to accurately classify the pathological formation. Thus, in the International Histological Classification of Odontogenic Tumors, Jaw Cysts and Similar Lesions (MGK, series No. 5, 1971, 2017, 2022), the list of histological types ends with section IV – unclassified lesions [1,2].

One of such debatable lesions of the maxillofacial region are gingival cysts in adults.

Contradictions of opinion relate to the age period of the onset of pathology, prevalence, localization, depth of location, histological structure, origin and possibility of combination with lateral periodontal cysts [3-5]. Usually, these pathological formations are described as childhood cysts [6], often eliminating the possibility of their occurrence in adulthood. However, in the clinic, various age groups of the population are affected by this pathology, therefore, it is necessary to continue research in this direction. The purpose of the study was to analyze data on the origin and pathohistological features of gingival cysts in adults.

2. MATERIALS AND METHODS

The design of this study was formulated as a retrospective review of the literature, involving the analysis of target scientific works and personal observation data.

3. RESULTS AND DISCUSSION

Gingival cysts of adults (GCA) are non-inflammatory developmental cysts mainly localized in the frontal area of the lower jaw [3-5]. This formation was first mentioned by Ritchie and Orban (1953) and named “gingival microcyst” [3,7]. However, this finding was considered a histological error without a clinical explanation. Bhaskar and Laskin (1955) first described GCD as a separate pathological formation with characteristic clinical and radiological signs [3,8].

Gingival cysts in adults are a rather rare pathology. Thus, in a number of reviews, the prevalence of gingival cysts is minimal and amounts to 0.2% - 0.6% of the total number of diagnosed cases [9-11]. The reviews made by Reeve-Levy (1968), Buchner-Hansen (1979) described cysts localized only in the soft tissues of the gums, and quite rarely - covering the cortical plate, 40% of them being identified as epidermoid and keratocysts [9,12].

There are various theories for explaining the development of gingival cysts in adults: differentiation from heterotopic salivary gland tissue; cystic degeneration of epithelial fragments implanted in the connective tissue of the gums after injury; development of GCA from the remnants of the dental plate (Serre remnants), or the cellular remnants of Malasse islands, which are more often present on the vestibular side of the keratinized part of the gums [3,4,5,7,13,14].

The hypothesis that GCAs are odontogenic derivatives of the dental plate is based on studies of human fetuses, according to which the epithelial stalk that connects the developing tooth to the dental plate is resorbed at 9-10 weeks of fetal development, leaving behind epithelial structures that have become known as the glands of Serre. This epithelial stalk is prone to cystic resorption, which is evident from its tendency to degrade even before the dental plate is destroyed. As a result, microcysts are exfoliated into the oral cavity during teething, where some of them may remain in adulthood and become a source of GCA development [3-5].

Another theory of the development of gingival cysts in older people can be found in the works of Ch.Reeve, F.Wentz (1962), who studied epithelial inclusions in the periodontium in 31 cadavers of people who died at ages of 1-77. The most numerous epithelial islets were found in young people under the age of 20. With age, the number of epithelial cells decreases, but their location changes. So, in young people, they are more often located in the periodontium of the apical part of the roots while, in the elderly, they can often be found at the level of the middle and cervical areas of the root. This distribution of epithelial cells is explained by the presence of inflammatory infiltration, which is constantly present in the area of the gingival pocket, which

contributes to the proliferation of epithelial islands. This mechanism is probably inherent in the development of both gingival cysts of adults and children, lateral periodontal cysts, and botryoid cysts [14,15].

Histological verification of this pathological formation also has certain difficulties. Since GCAs can have an ultrathin epithelial lining, establishing an accurate diagnosis using hematoxylin-eosin staining can be difficult and falsely identified as a dilated blood vessel [3,16]. Immunohistochemical examination is a key factor in determining the final conclusion. Flattened, thin 1-3 layers of cells and an intracystic epithelial lining, which is formed by multi-layered flat, cubic or columnar epithelium with/without focal thickenings or plaques, can also be identified in GCA preparations and, in some cases, even respiratory epithelium is detected [3,16-19]. Sometimes, clear cells are observed with a cytoplasm rich in glycogen [17,18]. The presence of pigmented melanocytes scattered throughout the epithelial layer is reported [4]. In some cases, the lumen of the cyst has been described to contain keratin or amorphous eosinophilic material [4,12,20,21] and calcified material [5]. As the lesion increases in size, the rupture of the cyst membrane can be seen, as it begins to separate from the adjacent connective tissues.

We describe our clinical difficult identification of gingival cysts in adults: Patient D., 64 year-old, applied to the Podilsky Regional Center of Oncology of the Vinnytsia Regional Council with complaints about the presence of a tumor-like formation under the mucous membrane of the alveolar process of the lower jaw at the level of 31, 41 teeth, which appeared 5-6 months ago. Over the past month, the lesion has increased and interfered with talking and eating. This formation began to bother with the addition of inflammatory phenomena.

During the initial examination, a tumor-like formation of a rounded shape was found in the area of the oral cavity under the mucous membrane in the projection of the roots of 31, 41 teeth under the frenulum of the lower lip. The mucous membrane above the neoplasm is tense, bluish in color (Fig. 1). On palpation, it is dense, somewhat painful.



Fig. 1. A tumor-like formation on the alveolar process in the area of the frenulum of the lower lip

Computer tomography revealed a defect of a rounded shape, with clear boundaries, the size of about 1.0 cm, with the destruction of the vestibular cortical plate, with 31 and 41 teeth vital (Fig. 2).



Fig. 2. Computer tomography. Defect between the roots of teeth 31 and 41

Under bilateral mental anesthesia (Ultracain 4% - 2 ml), a trapezoidal incision was made with the base to the buccal fold of the lower lip. This approach is chosen to preserve the frenulum of the lower lip and avoid injury to the tumor-like formation. The mucoperiosteal flap was undermined, and a cyst was found between the roots of teeth 31 and 41 (Figs. 3 - 5). After that, a 1x1 cm cyst with yellowish contents was removed (Fig. 4). After removal of the cyst, a bone cavity of a rounded shape with clear even edges was determined, the medial walls of the

31st and 41st roots being visible in the wound (Fig. 5). The mucoperiosteal flap was returned to its original position and sutured.



Fig. 3. A cyst between the roots of 31 and 41 teeth



Fig. 4. Cyst lining

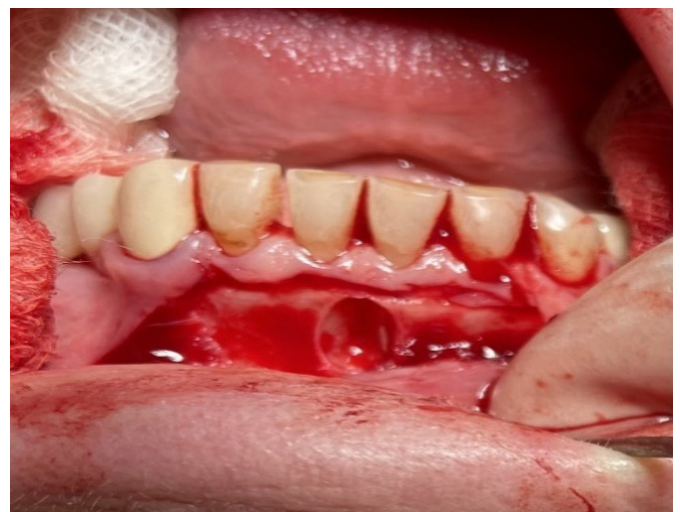


Fig. 5. Bone cavity after cyst removal

According to the results of pathohistological examination, lining of the cyst is represented by fibrous tissue with focal calcinosis, the epithelial lining being mostly absent, in some places represented by flattened single-row epithelium (Figs. 6,7).

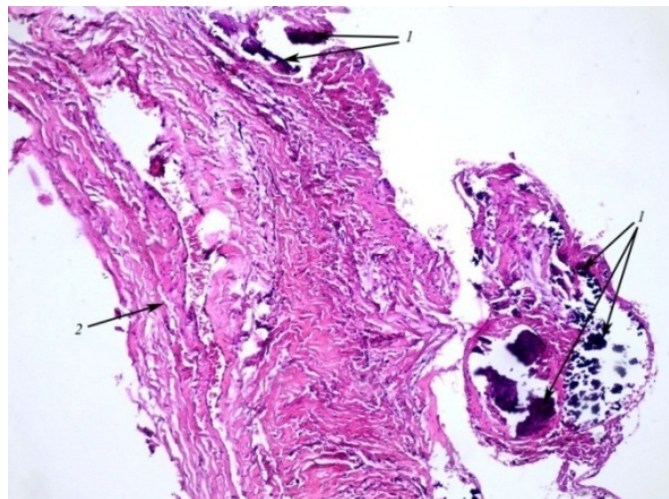


Fig. 6. Fragment of the cyst lining of patient D., 64 years-old. X 100. Foci of calcination (1) in the fibrous lining (2) of the cyst. x 100. G

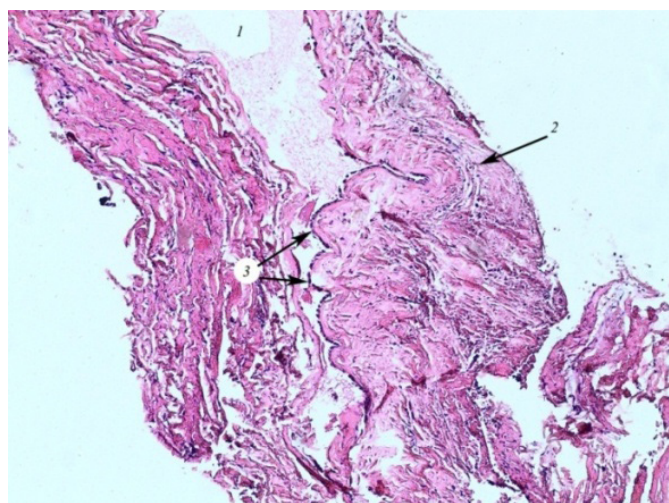


Fig. 7. A fragment of the cyst lining of the same patient x100. The lumen (1), fibrous tissue (2), lining (3) of the cyst. GE

The wound healed with primary tension, and no complications were observed. Thus, on the basis of clinical and radiological, pathohistological data, the diagnosis "gingival cyst of an adult" was established. The absence of an epithelial lining over a larger gap made it difficult to verify the formation. However, the age of the patient,

localization of the cyst (in the upper part of the alveolar process), deepening of the lesion into the bone tissue gave reasons for the final diagnosis. The peculiarity of cyst location (in the upper part of the alveolar process) is consistent with the data of Reeve et Wentz (1962) regarding the movement of the epithelium to the gingival margin in adult patients.

4. CONCLUSIONS

1. In some cases, gingival cysts can develop in adulthood. The variety of theories on the origin of gingival cysts in adults and the probably similar histogenesis with lateral periodontal cysts make difficult to verify the pathological formation.

2. Diagnosis of this type of cyst can be carried out on the basis of the clinical and radiological picture of the lesion.

3. Histological identification of GCA is difficult due to the possible absence of an epithelial lining, and if present, its diversity or ultrathin structure.

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