

CONTEMPORARY ASPECTS OF THE TREATMENT OF ODONTOGENIC JAW CYSTS IN CHILDREN

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ANNOTATION

This review describes methods of treatment of odontogenic cysts of the jaw bones in children and surgical rehabilitation of patients with this pathology. Literary data on various methods of surgical treatment of odontogenic cysts of the jaw bones in children are summarized. The prospects for recognizing odontogenic cysts using computed tomography are noted; the decisive preference in making a diagnosis is given to mandatory patho-histological examination.

Key words: odontogenic cysts, rehabilitation, cystectomy, children.

Relevance of the problem. According to the authors' data, among odontogenic cysts in children, inflammatory cysts are more common (radicular cysts - 49.4% and tooth-containing cysts - 37.7%). Odontogenic cysts are equally common in boys (54.9%) and girls (45.1%) with predominant localisation on the mandible. Children with radicular cysts sought inpatient surgical care at the age of 12-18 years (87.5%), with tooth-containing cysts at the age of 6-11 years (86.9%), and with follicular cysts equally often at the age of 6-11 and 12-18 years (47.6 and 52.4%) (Kushner A.N., Lapkovsky V.I., Petrovich N.I., 2020).

Due to the widespread occurrence of odontogenic jaw cysts, the urgent problem of maxillofacial surgery is the improvement of treatment methods for this pathology (Khatskievich G.A., 2009; Solntsev M.A., 2010; Vasiliev G.A., 2011), as well as with the presence of significant damage to the structures of the jawbone, complicated by premature loss of teeth, impaired chewing function, jaw deformation and the threat of pathological fracture (Mirsaeva F.E., 1999; Mukovozov I.N., 2002). The suppuration

of odontogenic cysts is often complicated by the development of sinusitis of the upper jaw, osteomyelitis of the jaw bones, abscesses and phlegmons that are life-threatening to the patient [2,3,7]. The development of central jaw cancer has been discussed as the epithelial lining of the cyst maligns. The problem is urgent because the lack of reliable information about the effectiveness of various methods of surgical intervention makes it difficult to develop accurate recommendations for the application of techniques of surgical treatment of odontogenic jaw cysts [4,6,19,24]. The main condition for a successful postoperative period in patients with jaw cysts is the restoration of regional blood circulation in the wound tissues after the incision in order to provide access to the cyst of the mucosa, periosteum and detachment of the mucosal-periosteal flap [14,16,20,25,26].

According to some authors, keratocysts of the jawbones account for 5.4 to 17.4% of all odontogenic cysts (Kreidler J.F., 2013; Cawson R.A., Odell E.W., 2018). Sometimes keratocysts in congenital pathology are included in the symptom complex (Gorlin syndrome, Marfan syndrome). A characteristic feature of the clinic of keratocysts is due to the fact that these formations do not have clear symptoms that allow to accurately diagnose them before surgery. Only in those cases when the cyst reaches a large size, symptoms appear in the form of teething disorders or their displacement, jaw deformity (V.V. Roginsky, 2015).

Small keratocysts are sometimes localised in periapical tissues, like periapical inflammatory cysts surround the tissues of an unerupted tooth, similar to a follicular cyst (tooth-containing cyst). It is a known fact that jaw keratocysts tend to recur many years after surgery (S.N. Fedotov, 2009). In the histological classification of odontogenic tumours - keratocysts are classified as tumours and are called "benign keratocystic odontogenic tumour" (WHO, 2005). Patho-histological examination of the diagnostic surgical material is crucial in making the diagnosis, but sometimes previous surgery and/or the characteristic sign of suppuration make patho-histological verification difficult because their characteristic epithelial lining is destroyed. There is also no consensus on the treatment of keratocysts. Different authors propose different methods of treatment: cystectomy, treatment of the cystic cavity with chemical preparations, with cryodestruction, etc. Some authors, taking into account the tendency of keratocysts to recur, favour a radical approach to treatment - resection of the jawbone (Donoff R.B., 1972).

According to M. Azimov (2015), patients with odontogenic maxillary sinusitis accounted for 4-6% of all patients treated. L.M. Emelyanenko (2010) and Kozlov B.C. (2013) provide data on the annual increase in the number of patients in this category, which is 1-2%. Despite the large growth of the disease, the results of surgical treatment

of patients with odontogenic maxillary sinusitis cannot be recognised as optimal. This information is confirmed by the data of M.M. Solovyov, P.Y. Shimchenko (2015) - 32% of patients in the distant period after the operation of radical sinusotomy according to Caldwell-Luke present the following complaints: a feeling of heaviness, a sense of pressure, sometimes twitching pain in the area of the operated maxilla; purulent nasal discharge; lacrimation, numbness of the upper lip, nose.

The above symptoms occur due to the fact that after removal of pathologically altered sinus mucosa there is no persistent regeneration, and this leads to prolongation of chronic inflammatory process (Malakhova M.A., 2005; Bykanova T.G., 2003; Gaivoronsky A.V., 2012; Palchun V.T. et al., 2012) and can lead to carcinoma (Sagalovich B.M., 2007). Painful symptoms also arise due to the fact that during Caldwell-Luke sinusotomy a part of the anterior wall of the sinus together with the mucous membrane is removed (Bogatov A.I. et al., 2003), in this case the total area of the sinus mucous membrane defect increases significantly and conditions for its poor regeneration arise again. Thirdly, long-term existence of chronic foci of odontogenic infection in the periodontium of the lateral group of teeth of the upper jaw leads to destruction of bone structures of the sinus floor and lesions of its mucous membrane.

G.B. Troshkova and V.A. Kozlov (2007) demonstrated that the severity of the process and its prevalence depend on the period of oroantral communication occurring after tooth extraction before its operative elimination.

Some patients who have undergone the classic Caldwell-Luke sinusotomy have complaints of paresthesia in the suborbital region, which can be explained by the traumatic nature of the intervention and the inflammatory process in the innervation zone of the suborbital nerve.

G.B. Troshkova (1997) suggested replacing the defect of the sinus wall with an allogeneic demineralized bone graft to prevent the soft tissues of the cheek and the formation of scar adhesions.

In order to improve the results of treatment of patients with odontogenic maxillary sinusitis, it is necessary to implement urgent measures, which include sanitation of foci of odontogenic infection of the upper jaw; prevention of the occurrence and timely elimination of oroantral communication after tooth extraction (Petropavlovskaya M.Y., 2019); minimization of traumatic surgical intervention of surgical treatment of maxillary sinusitis of odontogenic etiology. Lopatin A.S. (1998), Ippolitov V.P. et al. (2005); Kozlov B.C. (2003); Garrel R. et al. (2003) recommend the use of endoscopic technique, with the help of which it is possible to visualise the sinus through trepanation holes and to perform extirpation of the pathologically altered shell.

Cavity masses in the jaw bones are detected incidentally on radiographs performed for other purposes, some of them provoke the appearance of symptoms in the clinic: painful and painless swelling with a probable tendency to grow. Differential diagnosis of medium and small cysts of dysontogenetic origin is difficult, because odontogenic cysts "grow" slowly for many months or even years and do not bother the patient (T.G. Robustova 2003, I.S. Karapetyan et al. 2004, R.E.Mac-Donald, D.E.Avery 2003, K.V.Vgappop 2003). Long-term experience shows that the radiological picture of large cavity formations does not always allow to establish a preliminary diagnosis accurately and correctly, because the cavity syndrome can be a consequence of various pathological conditions: radicular cysts, keratocysts, follicular cysts, ameloblastomas, ameloblastic fibromas, neoplasms of different histological structure, this predetermines and aggravates the further fate of patients.

A lot of works are devoted to the radiological diagnosis of diseases of cysts of the maxillary sinuses (Rabukhina N.A., Chuprynina N.M., 1991). Diagnosis of peri-root cysts is most significantly represented by the following studies (Oliverio P.S., 2003; Ikeshima A., 2005). Literature data still show that diagnostic errors occur quite often (Ovrutsky G.D., Livshits Y.N., 2006). This fact is caused by some peculiarities of the clinical course of jaw cysts and their insufficient radiological semiotics [14,16,22]. A significant percentage of cysts has complications in the form of inflammation of the cystic cavity and sinus, thinning deformation of the maxillary sinus walls, sprouting into the nasal cavity, which makes it necessary to diagnose them more accurately and objectively in order to develop optimal treatment. Thus, objective assessment of the nature and dynamics of development of such odontogenic cysts is difficult and insufficiently studied [10,12,13]. At the same time, radial methods of research play a significant role in identifying the nature of odontogenic cysts, assessing their course, as well as the peculiarities of reparative osteogenesis in the postoperative period.

In the publications of scientists noted the prospect of recognising odontogenic cysts by computed tomography (Fig.1) [Anyutin R.G. et al., 1993; Kuznetsov V. et al., 1997; Lopatin A.S., Artsybasheva M.V., 2006; Ruston V.E., Horner K., 2007; Yoshiura K., Higuchi Y., Araki K., 2009].

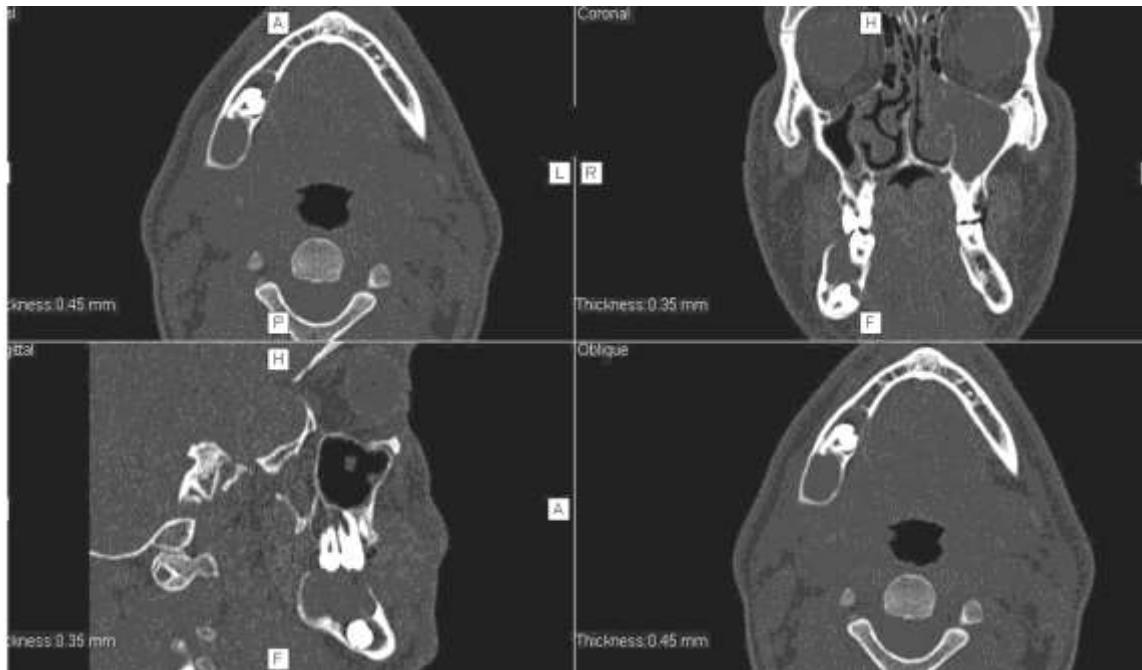


Fig.1 Follicular cyst of the mandible on the right side with the presence of homogeneous soft tissue content and a formed tooth. MSCT.

Computed tomography is performed to determine the size, contours and depth of cyst penetration into the adjacent soft tissues, this study provides an opportunity to determine the listed parameters layer by layer and accurately (Fig. 2) (A.A.Kulakov, N.A.Rabukhina, O.V.Adonina 2015, P.J.Boyne, D.Nou, C.Moretta, T.Pritchard 2019).



Fig.2 Computed tomography, odontogenic cyst on the left, nasolabial projection.

However, the final decisive preference for the diagnosis is the mandatory pathological examination [1,6,8]. The significance of X-ray contrast examinations in children in the diagnosis of odontogenic cysts, which undoubtedly provide valuable information about the distribution and localization of cysts (Fig. 3), is not sufficiently detailed.

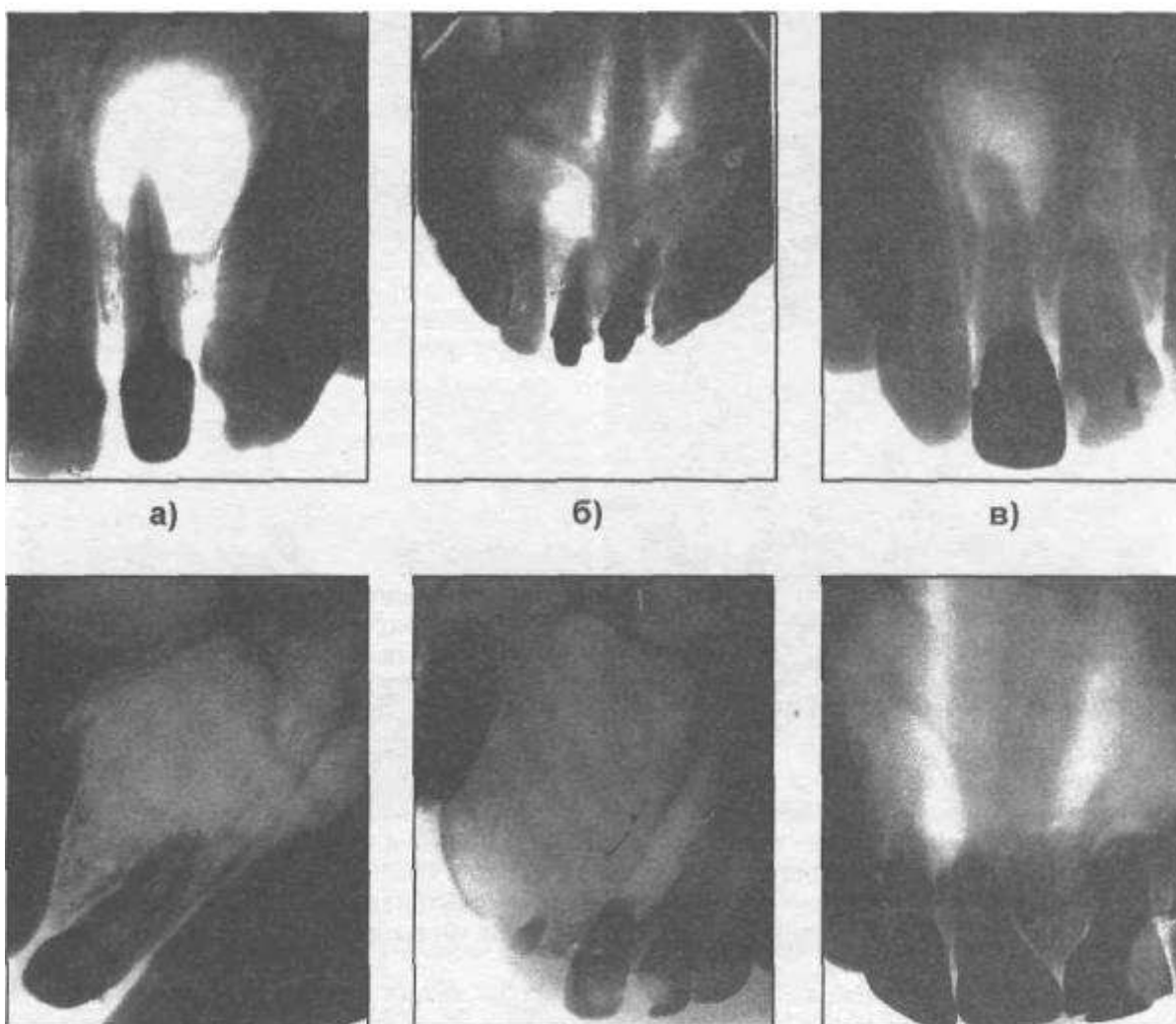
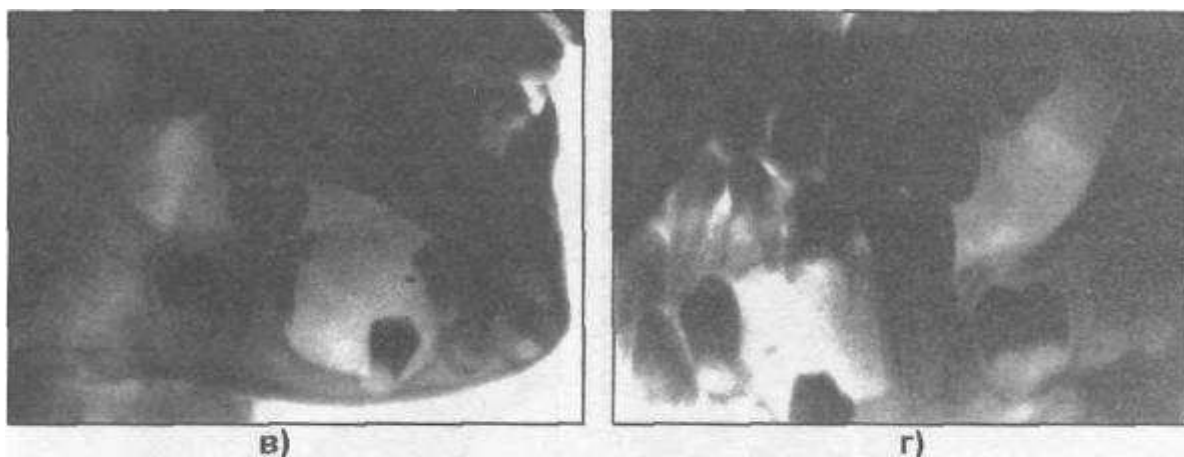


Fig.3

Radiological studies of cyst localization and size

The literature we have studied reflects little clinical and radiological characteristics of surgical treatment for the long-term results of odontogenic cysts of the maxilla and their sequelae. Meanwhile, such information is extremely important for clinical practice [3,5,7].



Fig.4 Radiograph. Root radicular cyst of the mandible.

To date, there is no unified approach to the treatment of large odontogenic cystic masses of the jaw bones and some types of benign tumours. The main reason for this is the high recurrence rate of the disease. The value of the recurrence rate, according to the literature, of keratocysts ranges from 0 to 63.5 % depending on the chosen technique. At the end of cystectomy (Fig.5), the value of recurrence rates can be 18.9% (Zhao Y.F. et al. 2012) and even 54.5% (Morgan T.A. et al. 2015), while a recurrence index of 0-2% (Zhao Y.F. et al., Kolokyta et al. 2017) is obtained after jaw block resection and decompression (cystotomy) [2,4,19,21,24,25].

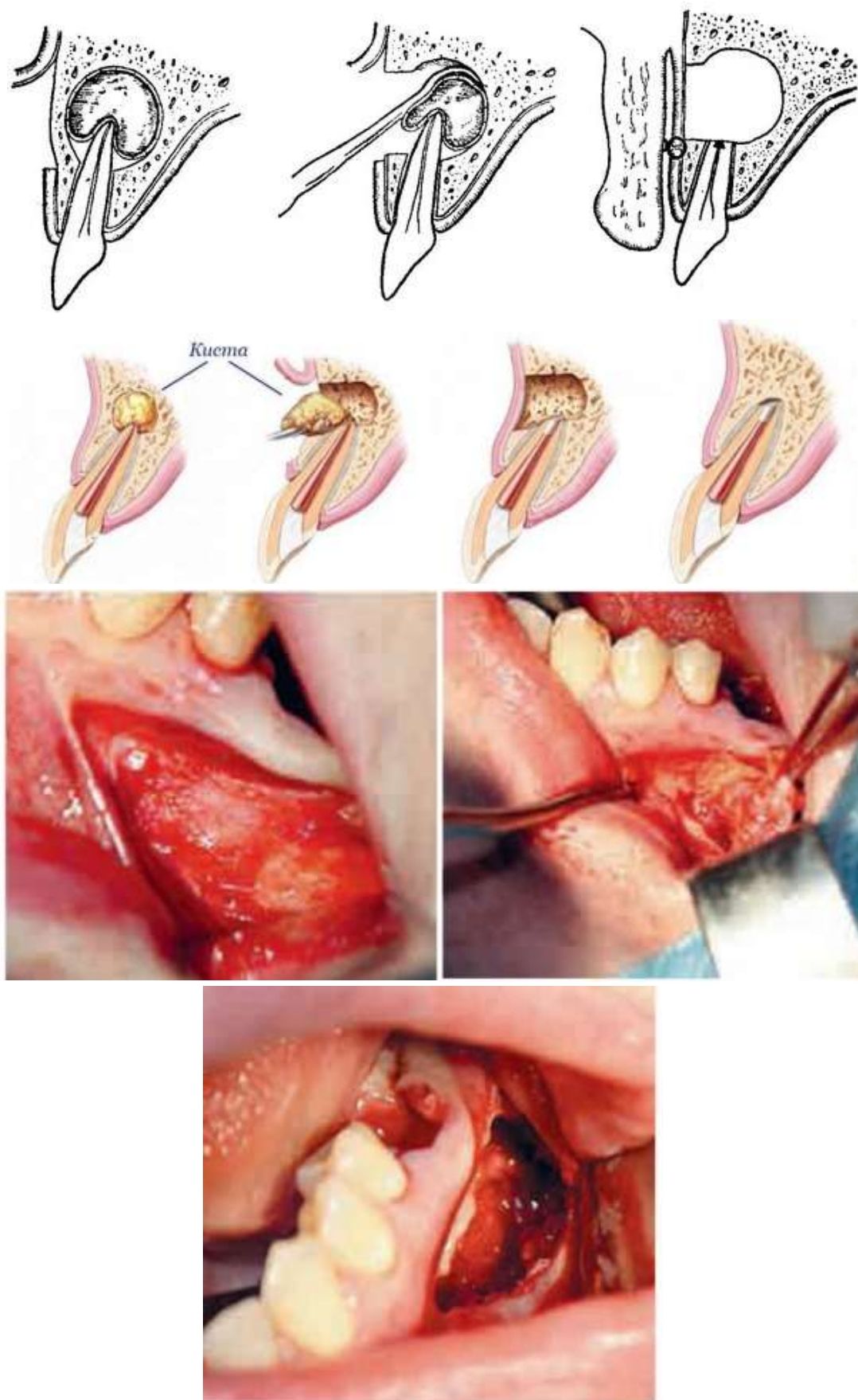


Fig .5.Cystectomy.

The greatest number of maxillofacial surgeons prefer radical resective techniques for surgery of extensive jaw cysts and benign tumours, which are more often crippling and require a multi-stage rehabilitation period.

In the socio-economic conditions of modern times, patients prefer outpatient treatment to a hospital stay and to reduce the period of disability associated with surgical intervention. Therefore, the dental surgeon must simultaneously offer an effective, least traumatic and affordable method of treatment [9,11,13,20].

Conclusions. *Summing up the above-mentioned, it follows that at present the urgent task of surgical dentistry and maxillofacial surgery is to improve diagnosis and to choose the optimal method of treatment of extensive odontogenic cystic lesions and benign neoplasms of the jaws, based on the most complete clinical and radiological picture.*

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