

Therapeutic Approach to Large Jaw Cysts

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Abstract

Introduction: Jaw cysts of various dimensions are a common pathology encountered in oral surgery. The therapeutic approach to these pathological outgrowths depends on their dimensions and locality. It is a challenging task for any oral surgeon to manage a cyst, be it mandibular or maxillary, by applying a primary closing method.

The aim of this paper is to present a case study involving two patients and our therapeutic approach to resolving a problem of mandibular and maxillary cyst, respectively.

The surgical technique we applied in these patients and the preoperative and postoperative problems encountered in both cases are also reported in the present study.

Conclusion: By comparing the orthopantomographic pictures taken prior to surgical intervention with those taken several months following the surgical intervention, we could observe a good regeneration of the bone. Both patients were reported to be feeling well.

Key words: jaw cysts, therapy, complications

Introduction

Jaw cysts appear to be a common pathology encountered in oral surgery (1-6). Since they can develop without revealing any symptoms, cysts remain undetected. It is one of the reasons they are detected in their manifest phase, once they have already reached impressive dimensions (7,8).

For some time the basic guideline in oral surgery relating to a choice of therapy for jaw cysts has depended on its size and locality (5,9-14). Nowa-

days, this basic guideline is still heeded, but the marsupialisation technique as a therapy method in treating cysts has increasingly been substituted by a technique of primary closing.

The aim of the present paper is to give a detailed description of two individual cases by describing a comprehensive surgical procedure as well as the problems encountered during the intervention and in its aftermath.

First case study big mandibular cyst

A patient with initials B.Lj. was admitted into the Department of Oral Surgery, complaining of pain and swelling in the region of lateral teeth in the lower jaw. After clinical examination we could observe mandibular swelling in the vestibulum on the left side of the transcanine area. By palpation we could feel fluctuation and partly also Dypitren's phenomenon.

Thanks to orthopanthogram analysis we could clearly observe an X ray translucence with a 7cm - diameter and of oval shape, spreading from the lower right lateral incisor to the lower left first molar (Fig.1). The described phenomenon had affected the roots of the teeth between which it was located, and this was especially prominent in the region 33 and 34, respectively. A radiolucent line divided the described cyst from the surrounding bone.

On the basis of clinical characteristics and the described X-ray picture we diagnosed a cyst in the mandibular bone, being most probably of dento-genous origin (either radicular or residual cyst).

In the preoperative stage incision was made in order to do decompression. A great quantity of thick casein dirty-yellow content was taken out on that occasion.



Fig. 1. Orthopantomogram before operative procedure in mandibula

During the surgical intervention, the operating field was anesthetized by applying inferior alveolar nerve block anaesthesia along with additional V anaesthesia. An incision was made in accordance with Peter Novak's procedure from the tooth 42 to tooth 37. The flap was raised and the bone was displayed. By applying corticotomy from the vestibular side of the mandibula in the region 34, a two-centimetre trepanation was made. The cyst sheath was displayed on that occasion. We tried to shed it bluntly. At this, the cyst sheath was punctured whereupon a profuse quantity of thick casein content of dirty-yellowish colour erupted (Fig. 2). The sheath was enucleated completely by applying sharp curettes. The tooth 34 was extracted (Fig.3). After profuse rinsing with the physiological solution and natrium hypochlorite the mucoperiosteal flap was mobilized and the wound was primary closed with interrupted sutures.



Fig. 2. Mandibular cyst enucleation



Fig. 3. Bone cavity after cyst enucleation

In the postoperative period penicillin antibiotics were administered for 10 days. Antiflogistics and analgetics were also recommended to the patient.

The biggest problem in the postoperative recovery was a communication established between the surgical wound and the oral cavity which ensued due to the suture dehiscence. Regardless of the fact that the flap was initially well mobilized and sewn up, the pull force of the adjacent muscles provoked additional tension resulting in loosening of sutures. The outcome of this communication was continual accumulation of food scrapings in the bone cavity. In order to prevent infection, which was potentially the most threatening factor to a successful conclusion of the surgical intervention, we opted for regular, daily rinsing with NaOCl^{1*} solution and soft tamponage with iodoform gauze with the aim of mechanically preventing the entry of food, and thus, to enable drainage.

When the surrounding mucosa was sufficiently recovered, the patient was provided with the appropriate obturator which was gradually being shortened to enable the bone regeneration (Fig. 4).

By patohistological analysis of the cyst content we diagnosed the epidermal cyst with a thin connective sheath covered on the inner side by the multi-layered keratinised stratified epithelium thickening greatly the cyst lumen.

1 * NaOCl- natrium hypochlorite



Fig. 4. *Obturator*

The numbing sensation was present in the lower lip immediately after the intervention. Interestingly enough, the numbing sensation completely disappeared after several months so that the patient no longer complained of irregular sensations.

By analysing the first orthopantomogram of the same patient we diagnosed another cyst in the mandibular ramus on the left side, so that the enucleation of the second cyst was carried out six months later in addition to extraction of the tooth 38. This time, pathohistological analysis made it possible to diagnose a dentigerous cyst (Fig.5). Under a microscope, it was possible to observe a cyst wall lined by stratified squamous epithelium on the inner side, focally thinned down but permeated with inflamed cells, sporadically compressing a densely inflamed tissue substance.

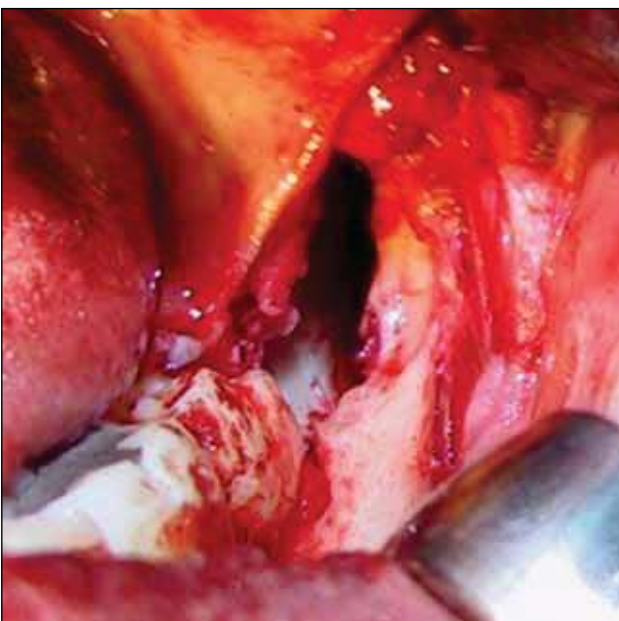


Fig. 5. *Bone cavity after enucleation of follicular cyst in mandibular ramus*

In this particular case it was possible to sew the wound up initially so that the postoperative period was far more comfortable for the patient.

Second case study – big maxillary cyst

A patient with initials I.K. was admitted into the oral surgery, also complaining of pain and swelling, but this time, in the upper jaw on the left side from the 23-28 region. By clinical examination it was possible to notice a deformity of maxilla in the indicated region from the vestibular side. By palpation it was also possible to observe Dypitren's phenomenon and fluctuation. On the alveolar ridge a fistula was observed. By applying pressure on the fistula a dirty yellowish content began to erupt.

Orthopantomogram showed an translucence with clearly defined boundaries comprising the 23-28 region of the 8-10 cm diameter. The described translucence diverged the roots of teeth between which it was located (Fig.6).



Fig. 6. *Orthopantomogram before operative procedure in maxilla*

On the basis of clinical characteristics and radiogenological finding we diagnosed a residual maxillary cyst because of the missing teeth 26 and 27.

After applying local anaesthesia in the surgical intervention we made incision after Peter Novak's procedure. The incision encompassed the 23 - 28 region. After raising the mucoperiosteal flap, we noticed that the cyst had resorpted the bone on the vestibular side 1 cm big. By a drill we extended the opening and began shedding the cystic sheath. In order to make the process of sheath curettage easier we made another trepanation in the region of the tooth 23. We left the bone bridge between the two openings (Fig.7).

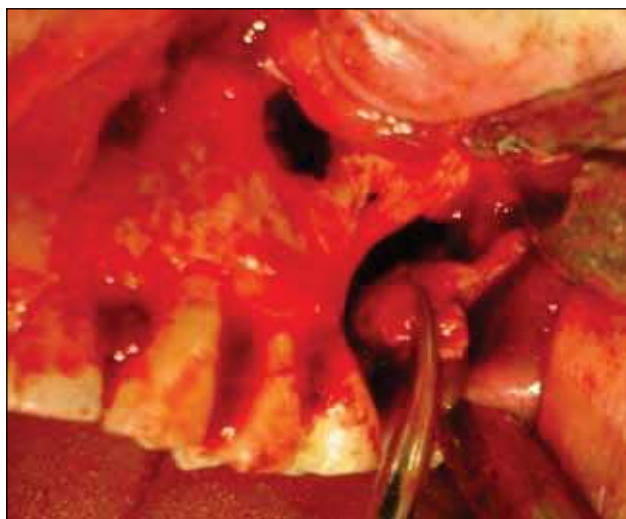


Fig. 7. Bone bridge

In the course of the intervention, as could be observed in the orthopantomogram, we reached a conclusion that the cyst had completely covered the maxillary tuber in the form of a retromolar small tongue. Therefore, we decided to extract the tooth 28.

After curettage the last remaining part of the cystic sheath, we rinsed the wound and applied tamponage with the iodoform gauze which was pulled through the drainage canal in the vestibulum (Fig. 8). The palatal flap was deperiostated and stitched up. The described cyst did not usurp the bottom of the maxillary sinus.



Fig. 8. Tamponage with iodoform gauze

By patohistological analysis of the sample a multi-layered stratified squamous epithelium with signs of parakeratosis was observed on the surface. Epithelial fingers were partly elongated and stick-like. Partly beneath the epithelium there was a proliferation of the granulation tissue with newly-formed capillary blood veins and inflammatory infiltrations of mononuclear cells with polymorphonucleus leukocytes, in other words, signs of hyperemia and erythrocyte extravasations were found.

The described patohistology picture conforms to the radicular maxillary cyst.

Discussion

Dentogenous cysts as benign pathological outgrowths pose serious therapeutic dilemmas when they reach big dimensions. The hitherto doctrine on therapeutic management of the cystic defects of mandibula with the diameter exceeding 3 cm, has implied that after enucleation the deformity should be closed by applying the open method. Thus, a part of the deformity would be left to epithelize subsequently. This therapeutic approach is certainly a prevalent one when we deal with edentulous lower jaw.

The question being posed now is how to manage a situation when we are faced with a big mandibular cyst with a preserved set of teeth. Our first case study related to this particular situation. Thanks to the trepanation on the vestibular side we managed to enucleate completely the cyst sheath. Since the entire tooth 34 jutted out into the cyst cavity, we opted for its extraction. However, suture dehiscence and, consequently, the communication established between the oral cavity and the bone cavity exacerbated the postoperative period.

In other words, the established communication had enabled the accumulation of food scrapings which posed a potential threat of the ensuing infection. Therefore, it was necessary to consider the possibility of delaying the extraction of the tooth 34 since this might have prevented the loosening of sutures and thus relieve the postoperative course.

Nevertheless, infection was prevented by regular, profuse rinsing with NaOCl solution and soft

tamponage with hyperconcentrated iodoform gauze. A month after the intervention when the adjacent mucosa had recovered sufficiently, the obturation prosthesis was made. This, in turn, significantly improved the quality of the patient's life and inasmuch as it played the role of a mechanical barrier, it was successful in preventing any further food accumulation or the ensuing infection.

During regular check-ups every 7-10 days the obturation prosthesis was gradually shortened in order to enable a complete bone regeneration.

Nowadays, a year after the cystectomy, the mandibular defect has completely been filled up with the newly-formed bone tissue which is easily observed in the radiological picture. (Fig.9)



Fig. 9. Orthopantomogram one year after operation

The authors Džambas and Džolev also dealt with the therapeutic treatment of mandibular cysts (2003). In their case study report they described the surgical procedure of enucleation of the cyst which had reached 7x4 cm dimensions. The intervention was performed under general anesthesia while the cyst defect was resolved by applying the open method.

In the above indicated case, after the epithelialisation of the bone defect surface, they also resorted to placing a partial mandibular post-resection prosthesis with the obturation part which was gradually being shortened to enable a bone regeneration (15).

In their paper the above mentioned authors have stressed the importance of team work of the maxillofacial surgeon and prosthetician in treating big cysts in the lower jaw (15).

Hence, the real problem being posed is a presence of the big bone cavity after the enucleation of cysts which have reached bigger dimensions.

Boimatov et al. (1992) also dealt with a problem of reducing bone cavities after cystectomy. In their work they described the application of the biogenic composite material based on hydroxyl apatite used for filling up the bone defects following the cystectomy procedure. Thanks to the reparation osteogenesis stimulated by application of this composite material, they succeeded in achieving the bone reparation after 6-10 months (16).

A year earlier (1991) the authors Moniaci and Nelken set a task of achieving a faster bone regeneration after cystectomy by systemic and local application of salcatonin (17).

Recently, decompressive methods in the treatment of mandibular cysts have become increasingly popular (Tarello, Aimetti, Fasciolo, 1997). In this manner, a combination of the jaw closing method and decompression reduces the bone cavity and speeds up regeneration (18).

Our second case study relating to a big maxillary cyst was interesting inasmuch as the cyst's distal outgrowth behind the last molar had completely destroyed the maxillary tuber, leaving a thin bone wall as the only barrier toward the important anatomical loge, i.e. fossa pterygopalatina.

The accidental intrusion into the fossa pterygopalatina could have caused the injury of a maxillary and bleeding with fatal consequences.

In these situations a recommended guideline is to remove only a part of the cyst sheath in the initial operative act. This policy is recommended in order to bide our time and allow a partial regeneration of the bone, while the enucleation of the cystic sheath would be completed in the second act.

This is also an example which shows that a cyst, appearing commonly as a benign pathological outgrowth, can also turn out to display the so-called „malign“ properties (can also turn out malignant).

In the postoperative course referring to the same patient we could only observe the appearance of a fistula on the alveolar ridge, being most probably an outcome of suture loosening. During regular check-ups a gradual reduction of the fistula opening was noticed, but ultimately it closed up spontaneously.

Conclusion

In therapeutic respect big jaw cysts require a complete enucleation. This approach has become an imperative in oral surgery. In patients with a relatively well-preserved set of teeth we are faced with a dilemma regarding the application of the operative method (either open or closed method)

In planning the surgical intervention it is critical to be aware of potential complications that can occur during and after the intervention. At this, it is especially important to beware of a potential injury of the vital anatomical elements and the ensuing postoperative infection.

Bone structures should carefully be protected because a regeneration process itself is reliant on them.

The regeneration process should be monitored by regular check-ups and radiogram analysis.

By comparing the orthopantomogram findings of our two patients from the case study reports we could observe a good regeneration of the bone. Both patients were feeling well and did not complain of any functional disturbances (Fig. 9 and Fig 10).

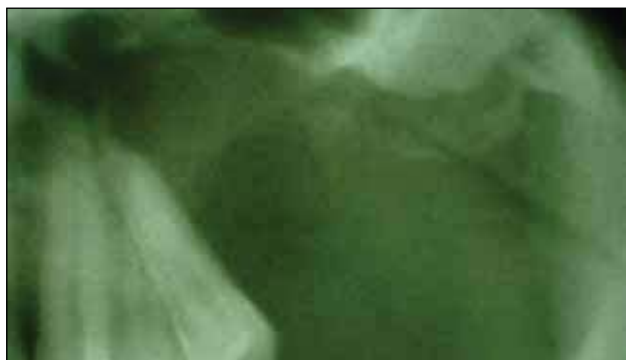


Fig. 10. Orthopantomogram five months after operation

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