

Surgical Treatment of Odontogenic Keratocysts by Intraoral Postoperative Suction

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Summary

Two cases of odontogenic keratocysts are presented of which the first occurred on the opposite side of the jaw after an operation for a follicular cyst, and the other recurred within a relatively short period. In neither case was the existence of Gorlin-Goltzov syndrome possible. Both odontogenic keratocysts were surgically treated by enucleation of the cystic capsule and postoperative intraoral suction. In the second case the procedure was repeated due to a recurrence.

The fact that permanent intraoral postoperative suction ensures the healing of mandibular bone tissue in a relatively short time, it had no influence on the possibility of the development of a recurrence during the treatment of an odontogenic keratocyst. The authors therefore conclude that during the treatment of odontogenic keratocysts the surgical method used is not important if the surgical method used is conservative. In such cases the marsupialisation method should be completely abandoned. Other conservative surgical methods include the risk of recurrence, and should the recurrence occur repeatedly there is a possibility of the keratocyst penetrating into the soft tissue where it is more difficult to treat surgically. The authors consider that by analysing the relevant clinical sample it is necessary to calculate how often severe recurrences of odontogenic keratocysts occur with expansion into the soft tissue or other perioral structures. Thus these data could be used during the treatment of recurrences of odontogenic keratocysts, in view of the perspectives which exist in the treatment of all locally invasive odontogenic formations.

Key words: *odontogenic keratocysts, surgical treatment, intraoral postoperative suction.*

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Introduction

Odontogenic keratocyst is a specific histological type of developmental odontogenic cyst, first described by Philipsen in 1956 (1). In 60% - 80% of all cases odontogenic keratocyst affects the mandible and is more frequent in men than women (2, 3). In 10% of patients it occurs as one of the signs associated with Gorlin-Goltzov syndrome (4).

Because of the high percentage of recurrence, which according to data from the literature ranges from 6% - 80%, various methods of treatment are recommended such as marsupialisation, cryotherapy, enucleation with or without the use of additional chemical means/agents (3-14) and enucleation with postoperative intraoral suction and segmental resection of the jaw (15, 16). Postoperative intraoral suction, described by Grgurević and Knežević (16, 17) has been used for 20 years at the Clinic for Oral and Maxillofacial Surgery, University Hospital "Dubrava", Zagreb. Hjørting-Hansen reported a similar method at the VII International Meeting of Oral Surgeons in Dublin in 1980 and again in 1993 (15).

The method consists of two parts. In the first part the cyst is surgically opened under general anaesthesia, its content removed and the capsule scaled and sample sent for histological analysis. A small suction tube is inserted in order to prevent negative and undesired effect of primary closure. The tube is 3 mm wide and 40 cm long, and is introduced through an auxiliary cut in the mucous membrane of the vestibulum, 1.5 to 2 cm in front of the bone cavity. The tube is secured to the mucous membrane by a mattress suture at the place of penetration, in order to prevent its movement and the entrance of air into the bone cavity. The edges of the wound are carefully sutured with monofilament catgut, so that the sutures are placed closer together than usual. The accumulated blood is extracted from the bone cavity by an aspirator for checking the closure of the wound and possible entrance of air into the bone cavity. When necessary additional sutures are made and a small plastic pump is placed on the end of the tube, which ensures negative pressure in the bone cavity. After coagulation of blood only the fluid part of the content is extracted by drainage. During the first two to three postoperative days the amount of

fluid obtained by extraction is the most copious and the plastic pump must be emptied two to three times daily. The patient is instructed on how to check the device and how to empty it. After three days the amount of serum extracted decreases and after five to six days the fluid completely disappears. The tube is usually removed together with the sutures, 8-10 days after the operation.

In order to prevent infection of the clot during the postoperative course all patients are protected by antibiotics for a period of five days. The medication of choice is Klavocin 625 mg three times daily and Medazol 3 times 400 mg daily. In the case of allergy to penicillin Klindamicin 300 mg 4 times daily is used.

The first postoperative clinical examination is performed after one month, and radiographic control of the healing of the bone defect after six months. Thereafter once a year until complete healing of the bone defect (16, 17).

Case presentations

1. A 32 year-old male was referred to the Clinic for Oral and Maxillofacial Surgery, University Hospital Dubrava because of a swelling in the vestibule of the mandible from the left side. The swelling was detected during a routine dental examination.

The case history revealed that the patient had been subjected to an operation twelve years earlier because of a large mandibular cyst from the right side, which the histopathological finding confirmed was a follicular cyst. The pathological lesion extended from the second lower premolar up to the middle of the ramus.

During the clinical examination a swelling was detected on the left side of the mandible, relatively sharply circumscribed, 8.5 cm long and around 3 cm high. The swelling was covered by smooth mucous membrane with no signs of inflammation. No visible changes were revealed during an external examination, although protruding outer wall of the mandible could be felt on palpation. The phenomenon of relaxed corticalis could also be felt on palpation. The jaw appeared inflated. There was no paresthesia of the left side of the lower lip.

Radiographic finding showed a sharply circumscribed unilocular translucency with an impacted lower wisdom tooth. The pathological alteration extended from the left second premolar up to the ramus, as far as the incisura. There was no resorption of the root of the lower wisdom tooth or remaining teeth (Fig. 1).

Differential clinical diagnosis indicated a follicular cyst, odontogenic keratocyst or monocystic ameloblastoma.

Because of the size of the cyst the operation was performed under general anaesthesia, Partsch II method, with extraction of the lower wisdom tooth and insertion of intraoral postoperative suction. The suction was removed on the fifth postoperative day (Fig. 2).

The histological finding confirmed an odontogenic keratocyst with parakeratotic stratified platelet epithelium with palisade basal layer and connective wall and horny scales in the lumen.

2. A young woman aged 18 years was referred to the Clinic with a swelling on the right side of the face in the region of the angle of the mandible.

Intraorally a sharply circumscribed swelling was found on the right side of the mandible, 8 cm long and 2.8 cm high. The swelling was covered with smooth unchanged mucous membrane, the colour of the surrounding mucous membrane.

The lesion started under the first lower right molar and extended into the ramus of the mandible up to the incisura. The germ of the lower wisdom tooth was missing, or was situated under seven, as the shadow of an undefined tooth crown could be seen in the projection of the roots. The root of the right second lower molar protruded into the cyst and reacted to electric stimulation. There was no movement of the tooth.

The phenomenon of relaxed corticalis could not be felt on palpation and the jaw looked inflated. No paresthesia of the lower lip was observed.

The radiograph showed a large, sharply circumscribed cystic translucency, extending from the angle of the mandible into the ramus up to the incisura. The shadow of an impacted tooth could be seen in the root projection of the second molar (Fig. 3).

Differential clinical diagnosis indicated a follicular cyst or ameloblastoma.

The operation was performed under general anaesthesia by enucleation of the cyst according to the principle of Partsch II, with the application of intraoral postoperative suction for a period of five days. A control radiograph was performed after one month, six months and one year. After one year a recurrence was determined by the second lower right molar, 2.5 cm x 2 cm in size (Fig. 4). A further operation was performed according to Partsch II method with intraoral suction and extraction of the lower right second molar. The suction was removed on the fourth postoperative day.

One month after the operation the clinical finding was normal and the radiograph showed the expected translucency at the site of the operation. Four months later the radiographic finding showed healing of the bone apart from a place with a defect of the lingual and buccal corticalis, probably due to scar tissue healing (Fig. 5).

The histological finding described a cystic capsule of parakeratotic stratified platelet epithelium, palisade basal layer and connective wall with some granulation tissue and tiny bone particles.

Discussion

In 1971 Jackson and Pratt (18) described a drainage system which they used in neurosurgery for removal of subdural haematomas. A similar method was later used in oral and maxillofacial surgery in the prevention of the formation of haematoma during operations in the soft tissue and surgical treatment of large pathological bone cavities in the jaw. An advantage of the method is prevention of large clots forming, which can become infected or by compressing the blood vessels and nerves (5-9) lead to their damage. A disadvantage of the method compared to the usual drainage with a rubber drain, is irritation and erosion of neighbouring structures and relative discomfort for the patient while wearing the suction, and also the possibility of wound infection (19).

By postoperative suction the purulent content and accumulated blood or serum is removed from the wound and the possibility of the occurrence of an empty space is prevented (16, 17). By applying the suction for a period of 5 to 7 postoperative days, negative pressure is created in the bone cavity, its volume is reduced by dragging the soft tissue towards the base of the bone, and primary healing of the wound occurs, as in the case of small bone cavities. Two to six months are usually necessary for complete restoration of the bone tissue, and thus ossification of the bone defect is shorter than in the case of the marsupialisation method.

Hjörting-Hansen (15) used a drainage system and described primary healing of the wound in more than 90% of cases, and complication such as non-healing at the place of dehiscence of the suture occurred in 9.5%. In our investigations complications occurred in only 2.8% of cases, due to necrosis and demarcation of part of the buccal mucous membrane above the bone cavity and infection of the content due to premature extraction of the suction (16). In contrast to Jensen and coworkers (20) we consider that the use of antibiotics prior to the operation is unnecessary.

Alexander and coworkers (21) concluded that the advantage of suction in the prevention of the accumulation of fluid in the cavity leads to the prevention of possible osmotic negative effect of fluid, accumulated in the empty space. Hjörting-Hansen (15) reported that in cases where suction was not applied dehiscence and secondary infection of the clot occurred more frequently (3).

Apart from the treatment of large mandibular cysts the system of intraoral suction is used in the case of purulent osteomyelitis and other severe maxillofacial infections.

Conclusion

A review of the literature shows that in the last century a large number of different methods existed for treatment of large mandibular cysts and that new possibilities are continually found, which today have still not been exhausted.

The basic problems, which attempts were made to solve by surgical methods, were postoperative recurrences, particularly in the case of developmental odontogenic cysts, known as odontogenic keratocysts or primordial cysts, and also the problem of healing large bone cavities, which is most frequently compromised by infection of the blood clot.

The application of chemical means or low temperatures used to destroy possible remains of the capsule, have no medical justification, because it is impossible to precisely determine the depth of their effect and because of the risk of complications. Rinsing the bone defect with 3% hydrogen peroxide in order to detect and remove eventual remains of the capsule is admissible.

After enucleation of a jaw cyst the method used for the healing of large bone defects is unimportant. However, the marsupialisation method is no longer an everyday method, but is applied only in the case of health compromised patients, in order to avoid the risk of an operation under general anaesthesia. All methods are satisfactory which primarily close the bone cavity and which at the same time attempt to reduce the empty space and prevent infection of the blood clot.

Finally, regardless of the surgical method used during the treatment of odontogenic keratocysts, we believe that recurrences will occur in all cases during which part of the cystic capsule remains in the cavity, or beside the basic cystic capsule are so-called microcystic satellite changes which develop in the immediate vicinity.