

CASE REPORT

Odontogenic Keratocyst, Resection, and Reconstruction with a Free Fibula Flap: A Case Report

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ABSTRACT

The mandible may be affected by a variety of pathological conditions such as odontogenic keratocysts (OKCs). It is generally benign, and conservative treatment can be enough in most of the cases. However, they can be clinically aggressive, and OKCs are prone to recur. The aim of this case report is to emphasize the importance of free fibula flap in the treatment of such lesions.

Key words: Benign cystic neoplasm, Free fibula flap, Odontogenic keratocyst.

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INTRODUCTION

The odontogenic keratocyst (OKC) is a cystic lesion of odontogenic origin, which is classified as a developmental cyst derived from the dental lamina. This lesion was first described in 1956 by Phillipsen.^[1] It is one of the most aggressive odontogenic cysts of the oral cavity. OKC is known for its rapid growth and its tendency to invade the adjacent tissues including bone. It has a high recurrence rate and is associated with the basal cell nevus syndrome. Pathologies predisposing to wide resection of mandible pose a great surgical challenge for head-and-neck surgeon for reconstruction and rehabilitation. Various techniques of flaps have been used since years. The goal of reconstructive surgery following ablation of soft- and hard-tissue loss is to reconstruct the defect at

the time of surgery primarily to facilitate a good wound healing and cosmetic outcome.^[2] The vascularized free fibula flap provides a good quality bone graft with a low complication rate.^[3-5] Multiple osteotomies can be made to reform the exact orientation of resected mandible. The presence of thick cortical bone makes it easy to rehabilitate the patient with implant-based prosthesis when compared to other flaps and hence represents the first choice for head-and-neck surgeons.^[6-9] The current study was designed to determine the results of using vascularized free fibular flap for reconstruction of mandibular defects.

CASE REPORT

A 14-year-old male patient reported to the outpatient Department of Oral and Maxillofacial Surgery, KIMS Dental College, Amalapuram, Andhra Pradesh in October 2017, with a complaint of swelling on the right side of the chin that caused considerable asymmetry of the face [Figure 1]. The swelling was noted 6 weeks previously, while its size increased gradually, but progressively. General physical examination ruled out the existence of a basal cell nevus syndrome. The intraoral examination was painless and caused no alteration in sensation over the mental nerve distribution. The labio-buccal sulcus was obliterated by a bony swelling and fluctuation was elicited in its center. The radiographs taken were ortho pantomo gram, intraoral periapical. Fine-needle aspiration cytology was done and pus was thick in consistency. Electrophoresis of the cystic fluid demonstrated low soluble-protein content (<3.75 g/100 ml). Tentative diagnosis of OKC was made and confirmed later by histologic examination of the surgical specimen. The cross-section showed parakeratinized stratified squamous epithelium with uniform thickness in most areas and with a prominent palisading basal layer, which was consistent with the pre-operative diagnosis of OKC. The surgical operation [Figure 2] was performed under general anesthesia by resection and reconstruction with a free fibula flap. The detailed steps of the surgical technique are outlined below.^[10] Pre-plating, plate removal, resection, replating, template-modeling, contouring, and fixation of the fibula represent the key points of the procedure.

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Bone Exposure

The lateral aspect of the mandible is exposed as necessary for bone resection with clear margins, and for inserting and fixing the reconstruction flap. At least a 3-cm margin, over the osteotomy is required to fix the plates.

Pre-plating

After the resection limits have been marked, a 3-mm bone plate is fixed by 7–11 mm screws to the vestibular side of the mandible. The use of the inferior margin of the bone is preferred when the external cortical bone is involved.

Plate Removal

The plate is removed, with cognizance of the screw-holes, that will be used for definitive fixation. Plate holes and mandibular screw holes can be marked to guarantee the correct matching at the time of replating.

Resection

The lesion is resected with safe margins, that is, a segmental mandibulectomy is performed. A minimum of 2 screw holes on each mandibular stump should be clearly identifiable for reconstruction.

Replating

The plate is replaced using the previously made screw holes. Careful attention should be paid to correctly identify and match the plate holes and mandibular screw holes. The mandibular profile is regained in this step.

Definitive Plating

When the pre-plating is performed on the inferior margin of the mandible, a second definitive plate is fixed onto the lateral aspect of the mandible.

Pre-plating Removal

The pre-plating is removed, and the definitive plate is left in place.

Template Modeling

A plastic sheet is shaped to create a template that will be used to model the flap, taking into consideration the estimated number, length, and orientation of fragments of the fibula and the location of osteotomies that will be used, and the gap between the mandible stumps, as well as the curvature of the plate.

Contouring of the Fibula

The fibula flap is detached from the donor site and modeled according to the shape of the template.

Fixation of the Flap

The modeled fibula flap is inserted between the mandibular stumps and fixed to the plate with multiple bicortical screws (length 7–11 mm). Finally, the micro-anastomoses are made and the skin of the flap, if present, is sutured in its definitive position. Post-operative esthetic results and correct dental occlusion are confirmed by evaluation of the oral cavity and computed tomography [Figure 3].



Figure 1: Swelling on the right side of the face and in the oral cavity



Figure 2: The surgical operation of odontogenic keratocysts

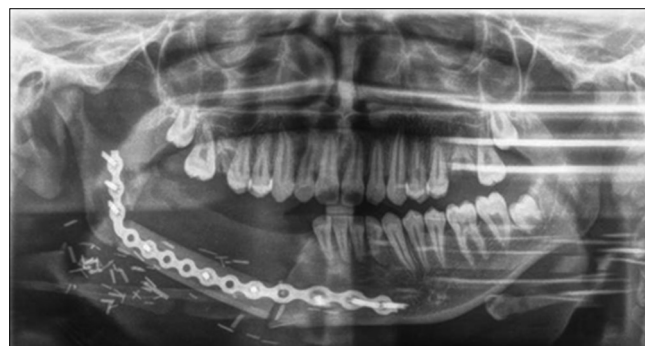


Figure 3: Post-operative esthetic results confirmed by evaluation computed tomography

DISCUSSION

The treatment of the OKC remains controversial. Treatments are generally classified as conservative and aggressive. Conservative treatment generally includes simple enucleation, with or without curettage, using spoon curettes or marsupialization. Aggressive treatment generally includes peripheral ostectomy, chemical curettage with Carnoy's solution and resection. Some surgeons believe that the cyst can be properly treated with enucleation if the lesion is removed intact.^[11] However, complete removal of the OKC can be difficult because of the thin, friable epithelial lining, limited surgical access, skill and experience of the surgeon, cortical perforation, and the desire to preserve adjacent vital structures. The goals of treatment should involve eliminating the potential for recurrence while also minimizing the surgical morbidity. The majority of cases of recurrence occur within the first 5 years after treatment. Because of the problematic nature of these cysts, many attempts have been made to reduce the high recurrence rate by improved surgical techniques. Because the lining of the OKC is characteristically thin and friable, removal of the cysts in one piece may be difficult. Great care must, therefore, be taken to ensure complete removal of the cyst lining, without leaving behind remnants attached to the adjacent bone or soft tissue. The high recurrence rate associated with OKCs is a result of satellite cysts confined to the fibrous walls of the OKCs. It should be emphasized that if the fibrous capsule is completely removed, no satellite cysts will be retained to serve as a nidus for recurrence.^[12] In view of the possible recurrence of the cysts from basal cell proliferation and because of the fragility of the cyst wall and the presence of satellite cysts, the osseous walls of the defect are abraded with coarse surgical or acrylic burs to ensure that residual peripheral cystic tissue is removed.

CONCLUSION

The OKC has been the subject of much debate over the last many years with respect to its origin, its growth, and treatment modalities. The obvious advantages of our treatment techniques are as follows:

1. Eradication of the pathologic lesion,
2. Reduction of the potential for recurrence, and
3. Preservation of the continuity of the mandible, thus maintaining jaw function and shape.

Mandibular reconstruction using a free fibula flap can achieve good functional and cosmetic outcomes. Even though each step in modeling the flap is important, fibula pre-plating and templating should be considered to be crucial steps for facilitating the procedure and guaranteeing a satisfactory result for OKC.

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