



Contents lists available at ScienceDirect

Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology

journal homepage: www.elsevier.com/locate/jomsmp



Case report

Dredging—A conservative treatment for odontogenic tumor of jaws

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ARTICLE INFO

Article history:

Received 20 September 2016
Received in revised form 31 January 2017
Accepted 13 March 2017
Available online xxx

Keywords:

Odontogenic tumour of jaws
Dredging
Quality of life

ABSTRACT

Odontogenic tumors of jaws are aggressive in nature with different clinical features and histological patterns. Management of the odontogenic tumors has been one of the most controversial entities because of its large, rapid growth, high recurrence rate with a need for resection of mandible which is associated with number of complications such as loss of jaw bone support, deformity, dysfunction and psychological distress. There are various treatment modalities from conservative to radical approach, but studies have shown that even alternative conservative approach like dredging can achieve good results. In this paper we discuss treatment of odontogenic tumors by dredging method with a report of our three cases.

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Introduction

Management of the extensive odontogenic tumors like ameloblastoma and keratocystic odontogenic tumor (KCOT) has been one of the most controversial entities of the maxillofacial surgery because of its ability for significant expansion, extension into adjacent tissues, rapid growth and high recurrence rate.

Aggressive odontogenic tumour like KCOT and ameloblastoma are more common in jaws.

KCOT is “a benign unicystic or multicystic, intraosseous tumor of odontogenic origin, typically shows a thin, friable wall, have small satellite cysts within the fibrous wall which is often difficult to enucleate from the bone. Therefore, odontogenic keratocysts often tend to recur after treatment. Ameloblastoma is an aggressive benign odontogenic tumor of jaws with different clinical features and histologic patterns. Resection of the mandible has been the principle treatment of ameloblastoma as the chance of recurrence is extremely high if it is treated by an inadequate procedure [1].

Various therapies ranging from conservative methods, such as decompression, marsupialization, enucleation alone, enucleation and peripheral ostectomy with rotary instruments, application of Carnoy's solution, cryotherapy with liquid nitrogen to aggressive treatments like jaw resection have been reported in the literature. However, the universally accepted approach remains undecided.

The eradication of the tumor and the reduction of risks of recurrence and surgical morbidity are the main goals of all techniques [2]. Radical treatment can cause various complications such as facial deformity, loss of teeth, paresthesia. And the conservative management like enucleation which means removal of pathology along with the lining epithelium and primary closure of the cavity may not be sufficient in multicystic and invasive pattern for the clearance of tumour. So the conservative management like dredging can be carried out to prevent such complications.

The present paper introduces an alternative conservative procedure “Dredging. It is a repeated surgical procedure in which the enucleation of tumour along with overlying bone and mucoperiosteum in order to release intracystic pressure and facilitate the formation of new bone until no evidence of tumour cells are present in histopathology. which eradicate the tumor and restores the normal contour and function of the jaw.

Here we present three cases of odontogenic tumors treated successfully by dredging.

Case 1

A twenty five years-old female came with a complaint of swelling of right lower jaw with a history of extraction of 45 five months back. Extraoral examination revealed a hard, non-tender, diffuse swelling of right body region of mandible. On intraoral examination, there was a large swelling extending from 43 to 46. Orthopantomogram (OPG) showed multilocular radiolucency extending from 43 to 46 involving the entire alveolus leaving thin bone intact at lower border (Fig. 3a) and computed tomogra-

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phy (CT) showed multilocular appearance of mandible body with expanding buccal, lingual cortex leaving about 2 mm bone intact at lower boarder with perforation on both buccal and lingual cortex. Incisional biopsy was performed under local anaesthesia which confirmed the lesion as ameloblastoma.

Case 2

A twelve years-old male visited to maxillofacial surgery department with a pain and swelling on right side of face for 4 months. Examination revealed tender swelling in the lower jaw on the right side with obliteration of the vestibular sulcus intra-orally (Fig. 1d). OPG revealed unilocular radiolucency on the right side of the mandible extending from distal to 46, covering the crown of unerupted 47 and extending towards the ramus and coronoid process of mandible, where as posterior border of ramus and lower border of mandible was intact (Fig. 1a). Incisional biopsy was performed under local anaesthesia and sent for histopathological examination. On histopathology, unicysticameloblastoma was confirmed.

Case 3

A twentyfive years-old female complained swelling of right lower jaw for 2 months. On extraoral examination there was a painless, hard, non tender swelling. Intraoral examination showed swelling distal to 46 extending to the ramus of mandible. OPG showed multilocular radiolucency on right posterior mandible distal to 46 extending to the ramus of mandible (Fig. 2a). Computed tomography (CT) showed multilocular appearance of mandible body extending posterior to 46 to the ramus of mandible. Lower border was intact with little expansion of cortex. There was no perforation on buccal or lingual cortex (Fig. 2d). Incisional biopsy confirmed the lesion as keratocystic odontogenic tumor.

Based on OPG, Computerized Tomography (CT) and incisional histopathology reports all of our 3 cases were treated with dredging under generalanaesthesia. The perforated buccal cortex was removed by osteotomy for better access. And the whole tumour was scooped, cavity was checked. Ribbon gauze with an ointment was packed into the cavity. Excisional tissue was sent for histopathology. After 3 days ribbon gauze was removed and the cavity was left open for secondary epithelialization. Cavity was covered by acrylic plate with an extension into the defect area to prevent food entrapment. All the patients were advised to come for follow up after 3 months or immediately, if any complaint appears. Thereafter, the secondary removal operation was performed 3 months after the first surgery. Enucleation of scar tissue was done and was sent for histopathology. Cavity was left open for secondary epithelialization. We performed 2 consecutive surgeries until no tumor cells were found in the histopathologic examination. Till this period of time none of the patients have reported to us with features of recurrence as such.

Discussion

The contour of the face and oral cavity is directly related to the function and facial aesthetics. So, treatment of disease of the oral cavity becomes inadequate if it causes deformity of face. Deformity of the oral cavity causes functional inconvenience, aesthetic dissatisfaction and mental agony. So, the purpose should be correction of the disorder as well as to restore normal contour and function of the jaw. Considerations should be given to the age of patient, site, nature, extension of the lesion. Dredging Method is

considered to fulfill these purposes. It is seen that after deflation and enucleation, the tumor cells are identified in the scar tissue within the bony cavity which is the cause of recurrence. So the scar tissue should be dredged out repeatedly to prevent the recurrence as well as to accelerate new bone formation. OPG as well as CTscan of all of our three caeses shows good healing of bone (Figs. 1b,f,g and 2b,e,b). We got very low recurrence by this technique. Follow up of these patients started when tumor cells were not identified in two consecutive microscopic examinations of dredged tissues. But often dredging is continued only for restoration of bony defect. For the treatment of jaw tumour, a continuous and regular follow up is an essential. It is recommended that this new technique should not be applied if the patient is not totally motivated for long term duration of follow up.

The treatment of unicystic ameloblastoma can be radical or conservative [3]. The radical approaches can be achieved by resection of the lesion followed by insertion of reconstructive plates[3,4]. Resection of the mandibular condyle in children can cause appreciable dentofacial deformities, which may result in impairment of mastication, swallowing, speech, and facial asymmetry [2,5], which directly influences their quality of life. Lau and Samman [2] reported that the recurrence rates for unicystic ameloblastomas were 3.6% after resection, 30.5%after enucleation alone, 16% after enucleation followed by application of Carnoy's solution, and 18% after marsupialisation with or without further treatment. Seintou et al. [4], reported a recurrence rate of 29.4% after enucleation or excision, and several other series have shown that resection is the treatment followed by the lowest recurrence rate [6].

KCOT is defined as “a benign unicystic or multicystic, intraosseous tumor of odontogenic origin, with a characteristic lining of parakeratinized stratified squamous epithelium and a potential for aggressive, infiltrative behavior.” The orthokeratinized variant of the odontogenic keratocyst is not included in the KCOT. WHO “recommends the term keratocystic odontogenic tumor as it better reflects its neoplastic nature” [7]. Histopathologically, KCOT typically shows a thin, friable wall, which is often difficult to enucleate from the bone in toto and have small satellite cysts within the fibrous wall, with columnar epithelium and parakeratinized epithelium. Therefore, odontogenic keratocysts often tend to recur after treatment, which ranges from 13% to 63% [8]. Treatment of KCOT remains controversial. KCOT treated with enucleation had a significantly higher recurrent rate than those treated with other methods [9,10]. Enucleation is a conservative surgical procedure which involves removal of pathology along with the lining epithelium and primary closure of the cavity. But it may not be sufficient for the clearance of the tumour due to its thin fragile lining and satellite microcystic nature. Based on the high rate of recurrence, most authors advocate radical enucleation for small unilocular keratocysts and suggest resection and bone grafting for very large lesions. But there is a general agreement that complete removal of large multilocular KCOTs of the mandible ramus may be difficult because of the possibility that remnants of cystic tissue or that satellite microcysts may be left behind. The involvement of the condylar process of the mandible may require even disarticulation and then reconstruction with bone grafts causing aesthetics and functional damages that, especially among young patients, could give the patient a poor quality of life [10].

All of our cases were dredged out repeatedly until no tumor cells were found under microscopic examinations. Good healing of the bone was observed in OPG and CT after 6 months follow up (Figs. 1c,f,g, 2 c,e and 3c). New bone formation is accelerated and intra bony pressure is reduced as scar tissues are removed. Histopathology reports of the scar tissue suggestive of being free of tumors will hence reduce the recurrence.

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