Surgical Treatment of Mandibular Ameloblastoma: Resection and Concomitant Reconstruction with an Iliac Bone Graft

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Abstract

Ameloblastoma is a benign odontogenic tumor with locally invasive behavior, which can cause apparent deformity and functional impairment. It has high recurrence rate. It arises from odontogenic epithelium and mainly affects adult patients after the third decade of life, frequently in the posterior region of the mandible. This case presents a surgical treatment of Ameloblastoma in the mandibular corpus region. The radiographic examination showed a radiolucent multilocular lesion extending from the left lower first incisor to the first molar. The treatment of choice was wide resection and primary stage mandibular reconstruction with iliac crest graft under general anaesthesia. In conclusion, wide resection of ameloblastomas minimizes recurrences and reduces the need for new interventions.

Keywords: Adamantinoma; Ameloblastoma; Mandible; Resection

Introduction

In 1885 Malassez introduced the term “Adamantine epithelioma” while in 1890 Derjinsky introduced the term “Adamantinoma”. In 1930 Ivy and Churchill encouraged the use of the term “Ameloblastoma” which is preferred terminology till date [1]. Ameloblastoma is a locally aggressive tumour that represents one percent of all tumors of head and neck region [2]. In the 2005 WHO, Ameloblastomas were classified as solid/multicystic, extraosseous/peripheral, desmoplastic and unicystic types. Solid/multicystic ameloblastoma is divided into two basic histopathologic patterns: follicular and plexiform [3]. Etiology of benign odontogenic tumors is unknown. A majority of them seem to arise without an apparent causative factor [4]. Treatment methods consisted of radical surgery (segmental resection and mandibulectomy) and conservative treatments (enucleation with bone curettage) [5].

Case Report

We present a 47-year-old female patient with an ameloblastoma in the posterior mandible who was treated with complete resection of a mandibular segment. The patient gave a history of cyst removal without recognition of the presence of ameloblastoma in 2014 in a dental office. One year later, the patient was admitted to the Clinic of Maxillofacial Surgery in Varna with complaint of severe pain in the side of the surgical intervention. The patient was diagnosed with ameloblastoma by means of histological examination of biopsy specimens. Despite this fact, she refused an operation. In January 2020, the patient was referred to the Clinic of Maxillofacial Surgery, St. George University Hospital with the complaint of facial asymmetry, painful swelling on the left side of lower jaw and impaired masticatory function. Clinical examination revealed the presence of expansion of the buccal cortical plate on the left side of mandible from the midline to the first molar (Figure 1 and 2). The radiographic examination showed a radiolucent multilocular lesion extending from the left lower
first incisor to the first molar. Resorption of the roots of the lateral incisor and canine was also revealed on OPG (Figure 3). Computed tomography (CT) scan of head and facial bones was performed to establish the extent of the lesion (Figure 4). The treatment of choice was wide resection and primary stage mandibular reconstruction with iliac crest graft under general anaesthesia. Multicystic ameloblastoma was diagnosed after the histopathological audit. It is characterized by an aggressive infiltration of adjacent tissue. Thus, the formation was resected with a safety margin of at least 2 cm of normal bone (Figure 5-8). The autologous bone grafts has the ability to remodel with physiologic function of the mandible. We prefer non-vascularized grafts for reconstruction of mandibular continuity defects less than 9 cm in length. We fitted a ligature wire 0.4 mm for trans-operative maxillo-mandibular block and to maintain occlusion. Titanium reconstruction plate and autologous graft were fixed with 9 screws - 4 were inserted in the angle of the mandible, 2 in the mentum and 3 in the graft (Figure 9). Single stage reconstructive technic employing a full thickness flap based upon the platysma muscle was performed (Figure 10). Both wounds were closed over suction drain.

Figure 1: Preoperative extraoral view.

Figure 2: Preoperative intraoral view.

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Figure 3: Preoperative orthopantomogram.

Figure 4: CT scan of head and facial bones.

Figure 5: Excised ameloblastoma.

Figure 6: Intraoperative view of ameloblastoma.

Figure 7: Harvested iliac crest graft.

Figure 8: Resected mandible.

In the Clinic of Maxillofacial Surgery, St. George University Hospital, Plovdiv, Bulgaria, between January 2005 - December 2019 26027 patients were admitted and 162 (0.6%) of the cases were diagnosed with ameloblastoma. Patients’ details were analyzed considering age-group, gender and site of lesion (Table 1). Of the 162 cases, 114 patients were males and 48 females, indicating a male: female ratio of 2.5:1. The age of occurrence for ameloblastoma in both jaws ranged from 32 to 96 years. None of the cases of ameloblastoma crossed the jaws midline.

Discussion

Ameloblastoma is locally invasive tumor that mainly affects adult patients after the third decade of life, frequently in the posterior region of the mandible. Ameloblastomas range in size - from small to very large. They may cause bony expansion and sometimes erosion through the adjacent cortical plate with subsequent invasion of adjacent soft tissues [6]. Long-standing cases of ameloblastoma may show...
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Table 1: Data of patients with ameloblastoma, diagnosed in the Clinic of Maxillofacial Surgery, St. George University Hospital, Plovdiv, Bulgaria, 2005 - 2019.

expansion which may be disfiguring and fungating and an ulcerative type of growth characteristic of that of carcinoma may be seen [6]. Apart from causing aesthetic problems, they also cause functional disturbances like in our case.

Radiology and location are the key factors to diagnose ameloblastoma correctly [7]. Radiographically, ameloblastoma appear as radiolucent lesion that may have either a unilocular or multilocular appearance. It may expand the cortical plate which gives rise to a paper-thin and soap bubble appearance on panoramic X-ray as well as CT scan [8].

Management of ameloblastoma remains a challenge and requires a thorough understanding of its clinical and pathological behavior in order to prevent recurrence associated with inadequately treated disease. Forms of treatment generally considered conservative are associated with high degree of recurrence. Wide resection minimizes recurrences and reduces the need for new interventions. The challenge in the management of large ameloblastoma of the mandible is not only to excise the tumor completely in order to prevent recurrence but also to provide the best reconstruction method [8].

Conclusion

Wide resection of ameloblastomas minimizes recurrences and reduces the need for new interventions. Achieving complete excision and reconstruction of the defect when the tumor is large is an extreme hardship in surgical management of ameloblastoma.

Conflicts of Interest

There are no conflicts of interest to disclose.

Bibliography


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