Management Issues in the Treatment of an Ameloblastoma with an Atypical Presentation

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Abstract

Benign ameloblastoma (BA) is the most common tumor arising from the odontogenic epithelium. Surgical resection with adequate margins is the mainstay of treatment due to the high index of tumor recurrence when not completely excised. Although locoregional spread has been described in the literature, it is very uncommon. We describe the treatment and follow-up of a 22-year-old woman with multiple recurrences and locoregional spread of a mandibular ameloblastoma who was referred to our center after several tumor resections with subsequent reconstructions. After a complete macroscopical removal of a new recurrence, the mandible was primarily reconstructed. A local homolateral recurrence and a second lesion in the contralateral maxilla were detected after 1-year follow-up and accordingly treated. After 4 years the patient showed a new tumor in the temporal fossa and was reoperated. The histopathology was consistent with a BA in all cases. Even though it is rare, locoregional spread of BA has been reported previously. Recurrences discovered during follow-up may require further resections. A close follow-up is mandatory, and treatment of these cases may result demanding requiring a multiple team approach, including oncologists and radiotherapists.

Keywords

- ameloblastoma
- metastasis
- atypical

Ameloblastoma is a benign tumor of odontogenic epithelial origin, accounting for 1% of all mandibular tumors and cysts.¹ They stem from dental embryonic remnants and may originate from any bone of the craniofacial skeleton, affecting 80% of the time in the mandible and 20% of the time in the maxilla.^{2–4} Although rare, metastatic spread of ameloblastoma has been described, being the lungs and cervical lymph nodes the most common site of metastases.^{5,6} Locoregional metastases other than regional lymph nodes are extremely uncommon. Aggressive surgical resection is the mainstay of treatment especially in large lesions, with a 50 to 72% incidence of local recurrence after enucleation or excisions with narrow margins.⁷ The role of chemo and radiotherapy remains controversial. This report describes the management of

a patient who presented multiple local recurrences, including a locoregional metastasis at the contralateral maxilla.

Case History

A 22-year-old woman was admitted to our hospital after being treated at other institutions on several occasions due to a benign ameloblastoma (BA) on the left mandibular ramus. Previous interventions consisted in conservative excisions and the function of the facial nerve had recently been impaired. The patient presented with a left perimandibular mass in the parapharyngeal space. Preoperative imaging ruled out other sites of regional or distant metastases, and showed the typical cystic lesions surrounding the previous

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attempt of mandibular reconstruction with bone graft and Dumbach mesh (►Fig. 1). Incisional biopsy performed at our center confirmed the diagnosis of BA.

We performed a total parotidectomy with en bloc removal of the tumor, including the left hemimandible and zygomatic arch. The mandibular contour was reconstructed with a fibular free flap. No supplementary soft tissue reconstruction was required. In the immediate postoperative period, the patient developed an orocutaneous fistula that required surgical drainage and filling of the dead space with an omental free flap. In spite of the local contamination, the fibular graft survived. The histopathology was consistent with a plexiform BA with adequate margins.

After 1 year, a routine computed tomography (CT) scan exhibited local recurrence together with a regional metastasis in the contralateral maxilla (►Fig. 2). In this opportunity the lesions were treated by means of a homolateral resection, preserving the fibular graft and a contralateral maxillectomy followed by prosthetic rehabilitation. The pathologist reported both tumors as identical to the original lesion.

After a 4-year follow-up, a routine magnetic resonance imaging (MRI) showed a new mass in the left infratemporal fossa compromising the anterior skull base and the homolateral orbital wall, compatible with a local recurrence (►Fig. 3). We performed an en bloc resection of the tumor including the lateral pharyngeal wall and part of the anterior and middle cranial fossa. The resulting defect was restored with an anterolateral thigh (ALT) flap including the vastus lateralis to seal the dura defect. The final histopathology report coincided with the previous ones (►Fig. 4).

After a 3-year period the patient developed the fourth recurrence treated in our unit, with an extensive affection of the left midface (►Fig. 5), requiring a resection of the tumor

from the left pterygomaxillary and nasal fossa, reconstructing the defect with a free myocutaneous rectus flap based on the deep inferior epigastric artery (DIEA). The patient has been free of disease for 5 years since the last reoperation. ►Table 1 shows the summary of treatment.

Discussion

Ameloblastoma is a histologically benign, but locally invasive tumor with a high tendency to recur. Metastasizing ameloblastoma, first described in regional lymph nodes and distant locations by Emura⁸ in 1923 and Vorzimer and Perla⁹ in 1932, respectively, is a rare entity with few cases described in the literature.^{10–12} Even though the literature on this topic has been plagued by inadequate documentation or inconsistent application of terminology, in 2005 the World Health Organization (WHO) classification system,¹³ state a clear distinction between ameloblastoma, malignant ameloblastoma, and ameloblastic carcinoma. Malignant ameloblastoma differs from ameloblastoma because of the presence of distant metastasis, although both share the same benign histology. Ameloblastic carcinoma has combined histologic features of ameloblastoma, with cytologic atypia and with or without metastasis.

Recent reviews until 2013 had showed that the most common sites of metastases are cervical lymph nodes and lungs, being other regional locations extremely unusual.^{6,10,11} In fact there are only four reports^{14–17} in the literature of regional metastases other than lymph nodes, specifically in the skull base and none in the contralateral maxilla.

The incidence of metastasis has been reported around 2%⁵ and the mechanism by which ameloblastoma metastasizes

Fig. 1 Preoperative imaging showing local recurrence on panoramic radiograph (a) and CT scan coronal view (b). Surgical specimen after the first intervention at our institute (c). Surgical defect (d).

Fig. 2 Regional metastasis to right maxilla (second intervention at our hospital): clinical aspect (a) and CT scan (b).

Fig. 3 MRI showing anterior and middle skull base recurrence (a, b).

Fig. 4 Low-power view showing typical islands of ameloblastic epithelium (on the left of the photo) with a cystic formation with the same epithelium (on the right). This belongs to the first resection done in our institution (a). High-power view showing ameloblastic epithelium without atypical features. This photo belongs to the recurrence in the contralateral maxilla (b). Low-power view of the recurrence of the skull base, showing the already mentioned islands in a fibrous stroma (c).

includes hematogenous route, lymphatic, and aspiration. Most reported cases of metastatic ameloblastoma suggest lymphatic or hematogenous spread, especially the latter one due to the presence tumor cells in the blood stream.^{9,18} Among the factors described as predictive of metastasis, the most important to consider include the female sex, the age of onset in the second and third decades of life, and the occurrence of multiple local recurrences, especially after unsatisfactory treatment intents.¹⁹ All factors have been completely consistent with our case.

The management of both benign and malignant ameloblastoma has been mainly surgical, including adequate resection of the primary lesion and the metastasis; the authors recommend resection with at least 2 cm of margin whenever possible. Curettage and multiple operations increase the risk of metastases, especially to adjacent structures.¹⁵ Some advocate neck dissection if there is clinical or radiographic evidence of lymph-node involvement. Because of the overall low number of cases, it is not possible to predict whether neck dissection is beneficial. Radiotherapy and chemotherapy have been

Fig. 5 Midface recurrence imaging (a, b) and surgical view (c).

Table 1 Summary of the surgical procedures

Year	Site	Surgery details	Comments
<2001	Left mandibular ramus	Bone graft–Dumbach mesh	Other institution
2001	Left mandibular remnant and zygomatic arch	Fibular free flap	Orocutaneous fistulae treated with omental free flap
2002	Local recurrence and contralateral maxilla	–	Prosthetic rehabilitation
2006	Lateral pharyngeal wall and anterior/middle skull base	ALT free flap	–
2009	Left midface	Anterior rectus free flap	–
2014	5-year disease-free survival		

Abbreviation: ALT, anterolateral thigh.

unpredictable. Ameloblastomas were shown to be radio resistant, but it is currently recommended for unresectable tumors^{19,20} and chemotherapy with platinum-based regimens are considered to be first-line treatment as far as chemotherapy is concerned with some benefits in especially in terms of palliation.²¹

We present an unusual case of a recurrent BA, with incomplete previous resections, treated initially at our unit with radical excision using a free fibular flap and an additional free omental flap to seal the dead space of a postoperative fistula. Although our first resection achieved satisfactory margins, 1 year later the patient exhibited in routine imaging local recurrence and regional metastasis in the contralateral maxilla, without any previous report in the literature. Because of the recurrent nature of this tumor, we decided to resect the local recurrence and the contralateral metastasis with a prosthetic rehabilitation with more than acceptable aesthetic results. Another metastasis in the left infratemporal fossa compromising the skull base was detected, in this opportunity after an extensive resection; the important defect was restored with ALT flap. At the present time the patient has been disease free with close clinical and imaging follow-up. It is noteworthy to mention that presumably the insufficient initial treatment was the cause of the subsequent local recurrences even though the posterior procedures were achieved with satisfactory margins. Yet, it is undeniable that the aggressive biology of the tumor

can also explain the recurrent nature and the locoregional metastasis.

Because of the rare but confirmed existence of metastases and the possibility of late-onset recurrences, we suggest that a prolonged clinical and radiological follow-up should be done on this kind of patients. Recurrences discovered during close imaging follow-up may require more economic resections than in the case of symptomatic patients. We also suggest a multiple team approach including oncologists and radiotherapists. Even though radiation therapy is controversial, it might improve the long-term local control. En bloc resections have proved to be the best treatment for this tumor, leading to an optimal local control and minimizing the risk of metastatic dissemination.

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References

1 Adebayo ET, Fomete B, Adekeye EO. Delayed soft tissue recurrence after treatment of ameloblastoma in a black African: case report and review of the literature. *J Craniomaxillofac Surg* 2011;39(8): 615–618

- 2 Verneuil A, Sapp P, Huang C, Abemayor E. Malignant ameloblastoma: classification, diagnostic, and therapeutic challenges. *Am J Otolaryngol* 2002;23(1):44–48
- 3 Goldenberg D, Sciubba J, Koch W, Tufano RP. Malignant odontogenic tumors: a 22-year experience. *Laryngoscope* 2004;114(10):1770–1774
- 4 Duffey DC, Bailet JW, Newman A. Ameloblastoma of the mandible with cervical lymph node metastasis. *Am J Otolaryngol* 1995;16(1):66–73
- 5 Houston G, Davenport W, Keaton W, Harris S. Malignant (metastatic) ameloblastoma: report of a case. *J Oral Maxillofac Surg* 1993;51(10):1152–1155, discussion 1156–1157
- 6 Berger AJ, Son J, Desai NK. Malignant ameloblastoma: concurrent presentation of primary and distant disease and review of the literature. *J Oral Maxillofac Surg* 2012;70(10):2316–2326
- 7 Inoue N, Shimojyo M, Iwai H, et al. Malignant ameloblastoma with pulmonary metastasis and hypercalcemia. Report of an autopsy case and review of the literature. *Am J Clin Pathol* 1988;90(4):474–481
- 8 Emura M. A case of metastatic ameloblastoma. *Jpn J Surg* 1923;24:760
- 9 Vorzimer J, Perla D. An instance of adamantinoma of the jaw with metastases to the right lung. *Am J Pathol* 1932;8(4):445, 3
- 10 Lin Y, He JF, Li ZY, Liu JH. Ameloblastoma with varied sites of metastasis: report of two cases and literature review. *J Cranio-maxillofac Surg* 2014;42(5):e301–e304
- 11 Jayaraj G, Sherlin HJ, Ramani P, et al. Metastasizing ameloblastoma—a perennial pathological enigma? Report of a case and review of literature. *J Cranio-maxillofac Surg* 2014;42(6):772–779
- 12 Van Dam SD, Unni KK, Keller EE. Metastasizing (malignant) ameloblastoma: review of a unique histopathologic entity and report of Mayo Clinic experience. *J Oral Maxillofac Surg* 2010;68(12):2962–2974
- 13 Sciubba JJ, Eversole LR, Slootweg PJ. Odontogenic/ameloblastic carcinomas. In: Barnes L, Eveson JW, Reichart P, Sidransky, eds. *World Health Organization Classification of Tumours. Pathology and Genetics of Head and Neck Tumours*. Lyon, France: IARC Press; 2005:287–e289
- 14 Ueta E, Yoneda K, Ohno A, Osaki T. Intraosseous carcinoma arising from mandibular ameloblastoma with progressive invasion and pulmonary metastasis. *Int J Oral Maxillofac Surg* 1996;25(5):370–372
- 15 Zwahlen RA, Grätz KW. Maxillary ameloblastomas: a review of the literature and of a 15-year database. *J Cranio-maxillofac Surg* 2002;30(5):273–279
- 16 Steinhäuser E. An ameloblastoma with distant metastases. *Fortschr Kiefer Gesichtschir* 1972;15:202–206
- 17 Devenney-Cakir B, Dunfee B, Subramaniam R, et al. Ameloblastic carcinoma of the mandible with metastasis to the skull and lung: advanced imaging appearance including computed tomography, magnetic resonance imaging and positron emission tomography computed tomography. *Dentomaxillofac Radiol* 2010;39(7):449–453
- 18 Dao TV, Bastidas JA, Kelsch R, Kraut RA. Malignant ameloblastoma: a case report of a recent onset of neck swelling in a patient with a previously treated ameloblastoma. *J Oral Maxillofac Surg* 2009;67(12):2685–2689
- 19 Henderson JM, Sonnet JR, Schlesinger C, Ord RA. Pulmonary metastasis of ameloblastoma: case report and review of the literature. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1999;88(2):170–176
- 20 Laughlin EH. Metastasizing ameloblastoma. *Cancer* 1989;64(3):776–780
- 21 Amzerin M, Fadoukhair Z, Belbaraka R, et al. Metastatic ameloblastoma responding to combination chemotherapy: case report and review of the literature. *J Med Case Reports* 2011;5:491