Case Report

Endoscopic Resection and Postoperative Brachytherapy in the Treatment of Sinonasal Melanoma

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Abstract

Sinonasal melanoma is a rare disease with limited data regarding its optimal treatment. It is an aggressive disease with up to 60% of patients developing local recurrence or distant metastases in the first 24 months after treatment. We report a case of sinonasal melanoma involving the skull base which was treated by endoscopic anterior craniofacial resection together with brachytherapy postoperatively. The patient has been followed up regularly and at 89 months there is no sign of local recurrence or distant metastases. The use of postoperative brachytherapy to achieve local control has not been reported in the management of sinonasal melanoma.

Keywords sinonasal melanoma; skull base; radiotherapy; brachytherapy; endoscopic resection

1. Introduction

Primary mucosal melanoma of the head and neck is a rare entity. It comprises less than 1% of all melanomas and < 10% of head and neck melanomas [3]. The National Cancer Data Base reporting on 84,836 cases of cutaneous and noncutaneous melanomas at all sites found that only 1.3% of melanomas were mucosal of which 55% were located in the head and neck area [3]; 80% of sinonasal melanomas are in the nasal vault and 20% in the paranasal sinuses [3]. The diagnosis is often delayed because patients present with vague symptoms (commonly epistaxis or nasal obstruction) and hence, at presentation, they often have locally advanced disease [3,6]. Local recurrence rate is high (in the range of 40–60%) and this is independent of the treatment modality used [3,6]. We present a case of sinonasal melanoma involving the skull base which was managed with endoscopic craniofacial resection and an iodine −125 brachytherapy applicator postoperatively and review the literature.

2. Case presentation

A 46-year-old female presented to the otolaryngology outpatient department at Groote Schuur Hospital with a 6 month history of recurrent epistaxis. On examination, she had a mass which occluded the entire right nasal cavity (Figure 1). She had no proptosis; her eye movements were normal and her cranial nerves were all intact.

A biopsy was taken and the histology revealed malignant melanoma. A chest X-ray did not show any lung metastases. Computed tomography (CT) (Figure 2) and magnetic resonance imaging (MRI) (Figure 3) scans showed a tumor occupying the right nasal cavity and septum, extending to the right anterior and posterior ethmoids, cribriform plate, and frontal recess.

The patient underwent an endoscopic craniofacial resection of the tumor. A wide middle meatal antrostomy was done with resection of the lateral nasal wall extending posteriorly as far as the sphenoid. The lamina papyracea was also removed. A septectomy was done to clear the margins anteriorly, inferiorly, and medially. Superiorly, the tumor eroded the cribriform plate. The cribriform plate was resected with possible microscopic disease left on the dura. A minor CSF leak was encountered in the area where
Figure 2: Coronal CT of sinuses showing the mass extending up to and eroding the cribriform plate on the right.

Figure 3: MRI shows the mass occupying the right nasal cavity and abutting dura.

the olfactory filaments were severed and this was repaired using a multilayer technique with fascia lata from the thigh, DuraGen, fat, and Dura Seal. A Foley’s catheter was used to support the graft and a lumbar drain was inserted. The specimen was sent to histopathology for further examination. The anterosuperior part of the septum as well as middle turbinate insertion into the cribriform plate had positive margins. Microscopy showed cytologically malignant looking cells whose shape varied from spindle-shaped to epithelioid and occasional cells contained microscopic amounts of black pigment. The immunohistochemical staining was strongly positive for HMB-45 and negative for MNF-116 and S-100. The diagnosis of a primary malignant melanoma was favored which was incompletely excised due to a positive margin in the region of the cribriform plate. The pathological staging was a pT4b (involving the skull base) according to the AJCC 2009 staging system.

One month later, multiple biopsies taken from the area of resection, including the area of the cribriform plate, were all negative. Due to uncertainty as to whether tumor had been cleared superiorly, a brachytherapy applicator was designed to treat the dura in the region of the involved cribriform plate that had been removed. The applicator was made of 24 carat gold, slightly curved in both anteroposterior (AP) and medial and lateral directions. It was 20 mm in the AP diameter and 13 mm in the medial and lateral direction. Iodine –125 seeds were placed on the superior convex surface of the applicator in a predetermined arrangement to deliver a dose of 60 Gy in 5 days at 2 mm from the surface of the applicator. The seeds were covered with a thin layer of acrylic. Under general anesthetic, the applicator was inserted through the nasal cavity and placed on the dura where it was stuck with both Tisseel and Surgicel. The nasal cavity was packed with a bismuth iodophosphate plug. As the applicator was not seated as snugly as desired, it was left in for 7 days so as to deliver 60 Gy at 4 mm from the surface.

The patient has been followed up regularly in the radiation oncology department together with annual CT scans. A positron emission tomography (PET) scan was done 51 months after surgery which did not show any local recurrence or distant metastases. An ultrasound of the abdomen done this year showed no metastases.

3. Discussion

Malignant melanoma of the sinonasal region appears to arise de novo without any precursor lesion and a metastatic melanoma in this site is rare [3]. Mucosal melanoma occurs mainly between the fourth and seventh decades and most studies do not show any sex predilection [3]. Examination may reveal a mass or polyp which may be pigmented or amelanotic [2]. Amelanotic lesions occurring in the sinonasal tract may be confused with other sinonasal tumors including sinonasal undifferentiated carcinoma, and olfactory neuroblastoma [2,3]. Immunohistochemical stains may help distinguish mucosal melanomas from other malignancies [2]. They are likely to stain positively for S-100, vimentin, and HMB-45, and negatively for cytokeratin and epithelial membrane antigen [2].

There is no universally accepted staging system for mucosal melanoma. Ballantyne described a simple system currently used for both cutaneous and mucosal melanomas of the head and neck [1]. This system consists of three stages: Stage I for localized disease, Stage II when nodal metastases are present, and Stage III when distant metastases are present. Up to a third of patients present with neck node metastases or distant metastases [3]. CT is used to evaluate the primary tumor and cervical lymph nodes. MRI is useful to evaluate the extent of disease, particularly for tumors penetrating through the skull base, to assess the extent of any brain involvement and also to distinguish blocked from involved adjacent sinuses. A chest radiograph is used to detect pulmonary metastases. Additional studies
may be indicated to detect distant metastases including chest CT, bone scan, and/or PET scan.

The most common treatment options for mucosal melanomas of the head and neck are surgery and radiation; either alone or in combination. Radical surgery with clear margins is the mainstay of treatment. Oncologic clearance in sinonasal melanoma can be challenging due to the close proximity of the orbit and anterior cranial fossa. The outcomes for the different treatment modalities are difficult to compare because it is a rare disease and there are no prospective trials. In a recent review of 115 cases of sinonasal melanoma by Lund et al., the outcomes of endoscopic resection and postoperative radiotherapy were assessed. All underwent surgical resection of the tumor, 31 (27%) endoscopically, and 51 (44%) also received radiotherapy [5]. Local control was achieved for a median of 21 months and a five-year disease control rate of 27.7%. The authors concluded that radiotherapy did not improve local control or survival [5]. Other studies, however, have found that while it does not appear to affect overall survival of patients with sinonasal melanoma, postoperative radiotherapy is associated with better local control [3,9,10]. In Temam’s retrospective review, patients who received postoperative radiotherapy often were more likely to have locally advanced disease [9]. It is therefore difficult to show a survival advantage because of the potential for selection bias.

In a meta-analysis, distant metastases were the most common site of recurrence (44%), with loco-regional and local recurrences occurring less commonly (17% in each) [7]. The data from this meta-analysis indicate that survival remains poor due to the high rates of distant metastases (44%) along with microscopic disease [7]. Patients with positive surgical margins have an increased risk of recurrence and lack of local control has been shown to increase the rate of distant metastases [7].

In spite of the lack of evidence, some authors still recommend postoperative radiotherapy in cases where there are positive surgical margins to improve local control [4,8,9].

To our knowledge, there are no studies which have looked at the use of postoperative brachytherapy to prevent local recurrence. An alternative to brachytherapy for treating a small localized area might be intensity modulated radiotherapy (IMRT). However, the volume delivered by brachytherapy is smaller and therefore more sparing of normal tissues. Brachytherapy is simple to plan and execute, takes 5 days as opposed to 6 weeks and although it involves a general anesthetic for resection and removal, is cheaper than IMRT.

4. Conclusion

Sinonasal melanoma is an aggressive tumor and has a poor prognosis. The use of brachytherapy to a localized area of uncertain clear surgical clearance is a novel approach and when combined with endoscopic resection, it reduces the morbidity of both extensive surgery and external beam radiotherapy to the nose and paranasal sinuses.

References