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Case Report

Long-Term Control of Primary Maxillary Sinus Transitional Cell Carcinoma with Surgery Followed by Radiotherapy: A Case Report

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Abstract

Maxillary sinus malignancies are uncommon. They are separated into squamous and non-squamous cells histopathologically, with most of them being squamous cell carcinomas. Maxillary sinus transitional cell carcinoma is extremely rare and is classified as primary (sinusal origin) or secondary (non-sinusal origin). Herein, we report the long-term control of primary maxillary sinus transitional cell carcinoma with surgery followed by radiotherapy. A 31-year-old female patient was admitted with a complaint of swelling on the right side of her face. Paranasal sinus computed tomography showed a right-sided maxillary sinus tumor. Biopsy revealed transitional cell carcinoma, following which the patient's right maxilla was totally removed with negative surgical margins. The final histological diagnosis was consistent with the previous diagnosis. The patient underwent postoperative radiotherapy. She remained disease-free at the 14-year follow-up. Knowledge concerning the treatment of maxillary sinus transitional cell carcinoma is limited. The combination of surgery and radiotherapy seems to be successful for this rare maxillary malignancy.

ABBREVIATIONS

AFIP: Armed forces institute of pathology; ChT: Chemotherapy; CT: Computed tomography; HPV: Human papilloma virus; MS: Maxillary sinus; MSMs: Maxillary sinus malignancies; MSTCC: Maxillary sinus transitional cell carcinoma; NSCC: Non-squamous cell carcinoma; OS: Overall survival; PORT: Postoperative radiotherapy; R0: negative surgical margin; R1: Positive surgical margin; RT: Radiotherapy; SCCs: Squamous cell carcinomas; SNCs: Sinonasal cancers; TCC: Transitional cell carcinoma; TNM: Tumor-node-metastasis; WHO: World health organization

INTRODUCTION

Sinonasal cancers (SNCs) comprise less than 1% of all body malignancies and 3–5% of all head and neck malignancies [1]. Additionally, 80% of SNCs develop in the maxillary sinus (MS). MS malignancies (MSMs) comprise 0.2–0.5% of all body malignancies, and the overall incidence is reported to be less than 1 per 100,000 [2, 3]. More than 50% of MSMs are squamous cell carcinomas (SCCs) [2, 4-7].

MS transitional cell carcinoma (MSTCC) is extremely rare and comprises less than 1% of all MSMs [8]. Depending on the origin of the tumor cell, MSTCC is classified as primary (sinusal origin) or secondary (non-sinusal origin or metastatic) carcinoma [9].

In this report, we present a long-term controlled case of right-sided primary MSTCC and briefly discuss the management and follow-up of the case, with a review of the MSMs.

CASE PRESENTATION

A 31-year-old female patient was admitted with a complaint of swelling on the right side of her face in January 2006. Regarding

her medical history, she described that this complaint had started with numbness and fullness on the right side of her face three months prior, and gradually increased. She was a housewife. There was no history of cancer, smoking, or alcohol consumption. On physical examination, the anterior wall of the right maxilla was expanded. Tumoral invasion of the right sides of both the hard palate and alveolar arc was seen. The cranial nerves were normal. There was no nasal obstruction or lymphadenopathy. Her general physical examination was normal except for the area of the complaint.

Paranasal and neck computed tomography (CT) revealed a right-sided MS tumor of 4 × 3.5 × 2.5 cm in size without lympadenopathy. The tumor was causing the destruction of the maxillary sinus floor, alveolar arc, and hard palate, with invasion of the soft palate and posterior wall of the MS (Figure 1 A, B).

The Caldwell–Luc biopsy procedure of MS was performed. Microscopic examination was compatible with TCC (Figure 2A). The serum biochemistry, complete blood count, thorax CT and abdomino-pelvic CT in the staging work-up were normal. The patient was staged as T3N0M0 according to the American Joint Committee on Cancer staging system for cancer of the nasal cavity and paranasal sinuses. Following the staging, right-sided total hemi-maxillectomy was performed. The histopathologic diagnoses of the surgical specimen and previous biopsy were similar (Figure 2B). In addition, the surgical margins were negative (R0). Postoperatively, the patient received 70 Gy of external radiotherapy (RT) to the right MS region.

Patient was followed up at 3-month intervals for the first 2 years, biannually for 2–5 years, and annually thereafter. The follow-up evaluation for this patient consisted of a physical examination, complete blood count, and serum biochemistry tests. Radiologic imaging was performed as clinically indicated or at least annually. She remained free of disease with no loco-regional or distant metastasis at the 14-year follow-up.

DISCUSSION

The risk factors of MSMs are cigarette smoking, alcohol consumption, and occupational exposure to nickel, chromium, formaldehyde, textile dust, and wood [1, 8]. The mean age varies between 58 and 64 years [1-5]. The incidence of MSMs is about between 1 and 2.8 times higher in males than in females [1-5, 8]. MSMs are usually diagnosed late due to growth in an air-filled cavity, the non-specific nature of the symptoms, and limited lymphatic drainage [3, 7]. The most frequent symptoms are nasal obstruction (45–64%), epistaxis (45–76%), facial swelling (32–87.9%), and pain (35–65%) [1, 7, 8]. MSMs should be suspected especially in patients with unilateral ongoing symptoms longer than four weeks [7]. The upper aero-digestive tract, cranial nerves, ears, and lymph node stations of the head and neck should be examined. The first-line imaging tool should

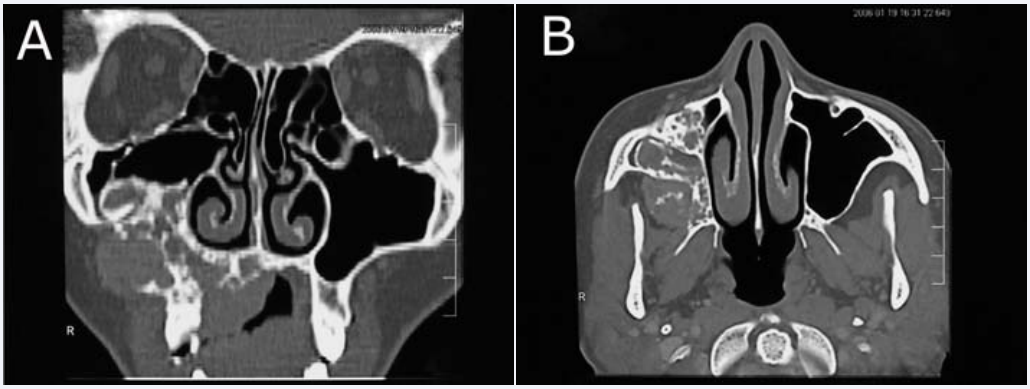

Figure 1 Coronal (A) and axial (B) planes of contrast-enhanced computed tomography of the paranasal sinus reveals a destructive right maxillary sinus tumor.

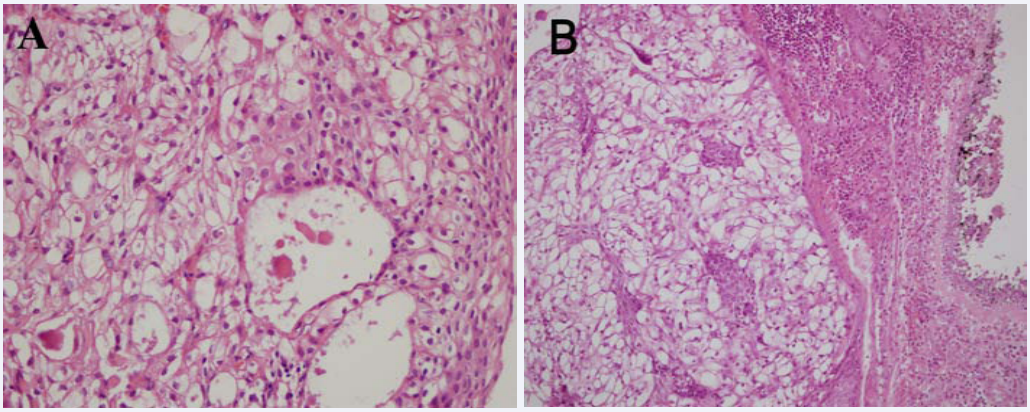

Figure 2 Pathological findings: hematoxylin and eosin staining images (×100) of the biopsy (A) and surgical (B) specimens.

be contrast-enhanced CT of the MS with bone and soft tissue windows. Moreover, the diagnosis should be confirmed by histopathological examination [6].

Pathologically, MSMs are classified as squamous and non-squamous cell [3-5]. The tissue diagnosis is squamous cell carcinoma (SCC) in 53–75% of patients [2, 4-7]. The most common (9.8–19.5%) detected type of non-squamous cell carcinoma (NSCC) is adenoid cystic carcinoma [2, 4, 5]. Transitional cell carcinoma (TCC) is also known as cylindrical cell carcinoma, Schneiderian carcinoma, and non-keratinizing carcinoma. According to the World Health Organization (WHO) and the Armed Forces Institute of Pathology (AFIP) atlas, TCC is a variant of SCC. However, opposing views are also available. TCC is strongly associated with human papillomavirus (HPV). TCC exhibits more overexpression of p16 protein (63% vs. 5%), a high Ki-67 labeling index (88% vs. 19%), and negative or low p53 reactivity (13% vs. 24%) compared with SCC [10]. HPV-positive cancers of the head and neck region have better overall survival and a greater response to RT than HPV-negative cancers [11]. In our case, HPV could not be evaluated due to the bone assessment process and because more than a decade passed after surgery.

More than three-quarters of MSMs are diagnosed in the advanced (≥ III) stages. The most commonly seen tumor-node-metastasis (TNM) stages are T3-4 (> 75%), N0 (> 75%), and M0 (> 90%). The histologic grades are well differentiated in 12.4–13.2%, moderately differentiated in 34.3–43.3%, poorly differentiated in 41.3–42%, and undifferentiated in 2.2–11% [1-4]. Our case had a poorly differentiated T3N0M0R0 tumor.

The treatment of choice in MSMs is surgery with R0 resection, followed by RT in most patients. Surgery alone is considered to be adequate in patients with stage T1 tumors except R1 resection, perineural invasion, or no differentiation. RT alone can be applied in the case of inoperable or unresectable tumors and rejection of surgery. In patients receiving RT alone, the doses for the clinical (primary+metastatic lymph nodes) and subclinical (clinically negative lymph nodes) disease regions should be at least 65 Gy and 50 Gy, respectively. Postoperative RT (PORT) doses to the clinical and subclinical disease regions in patients with R0 resection and a negative lymph node (N0) status are recommended to be at least 60 Gy and 50 Gy, respectively. However, the PORT dose to the high-recurrence risk regions should be increased to 66 Gy in patients with R1 resection and lymph nodes with extracapsular disease. Chemotherapy (ChT) should be applied concurrently with RT in patients with a positive surgical margin (R1) or positive lymph node status. The recommended radio-sensitizer chemotherapeutic agent is cisplatin. In metastatic patients, fluorouracil and cetuximab can be added [1, 2, 4-6].

Poor prognostic factors of MSMs are a late (>12 months) diagnosis, advanced (≥60 years) age, male gender, SCC (vs. NSSC) type, advanced TNM (T3-4, N1-3, M1) stage, no differentiation, R1 resection, monotherapy (RT alone), and prolongation (>50 days) of the scheduled time of RT [1, 2, 4-7].

The recurrence patterns of MSMs are local (61%), distant metastasis (27.3%), regional (10.7%), and loco-regional (1%). The 5-year rates of overall survival, local control, and freedom from distant metastasis in patients with MSMs were 34–35%, 43%, and 66%, respectively. Moreover, the 5-year OS rates were better (45.6% vs. 27.4%) in patients with NSCC than in those with SCC [2, 4, 5].

In conclusion, MSMs are rare neoplasms with a poor prognosis. They are diagnosed at advanced stages. Physicians should try to diagnose the disease at an early stage. The recommended treatment is surgery followed by RT. ChT should be administered with RT concurrently in situations that increase the risk of local recurrence. Additionally, our knowledge concerning TCC of the paranasal region is limited. Thus, we reported this case of long-term control of primary MSTCC with surgery followed by radiotherapy. As with other MSMs, we recommend this treatment strategy in patients with this rare histopathologic type. Finally, there is a clear need for studies involving a greater number of paranasal TCC patients.

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