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Intermediate- Grade Mucoepidermoid Carcinoma of the Hard Palate in Adolescent: A Rare Entity

Zakaria Toubi[1*], Nouhaila Tarhzaz[1], Dounia Kamal[1]

[1]Department of Reconstructive and Maxillofacial Surgery, Hassan II University Hospital of fez, Sidi Mohamed Ben Abdellah University, Faculty of Medicine, Pharmacy, and Dentistry, Fez, Morocco

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***Corresponding author:** Zakaria Toubi
Department of Reconstructive and Maxillofacial Surgery, Hassan II University Hospital of fez, Sidi Mohamed Ben Abdellah University, Faculty of Medicine, Pharmacy, and Dentistry, Fez, Morocco

Abstract **Case Report**

Introduction: Mucoepidermoid carcinoma [MEC] of the hard palate is the most common malignant minor salivary gland tumor but remains genuinely rare in adolescents. Its clinical presentation overlaps substantially with benign palatal lesions, which delays diagnosis and allows local invasion to progress before treatment begins. ***Case Presentation:*** A 16-year-old girl with no relevant medical history presented with a two-year history of a slowly enlarging right palatal mass. Clinical examination revealed a 4 cm soft, well-demarcated lesion with mucosal telangiectasia and bilateral jugulocarotid adenopathy. CT imaging showed a 40 × 27 × 24 mm lesion with cortical bone erosion and extension into the nasal cavity, staged cT4b N2c M0. The patient underwent right hemimaxillectomy with bilateral selective neck dissection [levels I–III]. Final pathology confirmed intermediate-grade MEC without lymphovascular or perineural invasion; surgical margins were positive and all dissected nodes were negative. Adjuvant intensity-modulated radiotherapy [IMRT] and prosthetic obturation were provided. At one year of follow-up, the patient showed no clinical evidence of recurrence. ***Conclusion:*** Advanced local disease is possible in adolescent palatal MEC even without constitutional symptoms. Early biopsy of any persistent palatal mass is essential. Multidisciplinary surgical and oncologic management, including adjuvant radiotherapy for positive margins, can yield favorable short-term outcomes even at presentation with an advanced stage.

Keywords: mucoepidermoid carcinoma; hard palate; maxillectomy; minor salivary gland tumor; rehabilitation.

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INTRODUCTION

Mucoepidermoid carcinoma accounts for roughly 5–10% of all salivary gland tumors and stands as the most common malignant salivary neoplasm across all age groups [1,2]. In adults, the parotid gland is the predominant site, but in children and adolescents the distribution shifts: minor salivary gland locations—particularly the hard palate—represent a larger proportion of cases[3,4]. Among intraoral minor salivary gland tumors, the palate is involved in up to 45% of cases, and MEC is one of the two most frequently encountered histologic types at that site [5].

Clinically, palatal MEC typically presents as a slow-growing submucosal mass that may appear bluish, violaceous, or flesh-colored, sometimes with a fluctuant feel that is easily confused with a mucocele or a palatal abscess. This overlap with benign entities is one of the main reasons the diagnosis is delayed, particularly in young patients where malignancy is not the first diagnostic consideration [6,7]. Published adolescent case reports consistently document this pattern: the lesion is present for months or even years before tissue sampling is performed [8,9].

We report the case of a 15-year-old girl who presented with intermediate-grade MEC of the hard palate staged cT4b N2c M0 and who was managed with right hemimaxillectomy, bilateral selective neck dissection, and adjuvant IMRT, with no evidence of recurrence at one year.

CASE PRESENTATION

A 15-year-old girl with no relevant medical history was referred to the maxillofacial surgery department for evaluation of a right palatal swelling that had been enlarging slowly over approximately two years. She reported no pain, no fever, no epistaxis, no nasal obstruction, and no change in her general condition.

On oral examination, there was an indolent, soft, well-demarcated mass of approximately 4 cm in its largest dimension, occupying the right premolar-molar palatal region and crossing the midline medially. The mucosal surface showed telangiectasia without ulceration or contact bleeding. Externally, the lesion extended to the attached gingiva. Extraoral examination was unremarkable, with no facial swelling and no cervical skin changes.

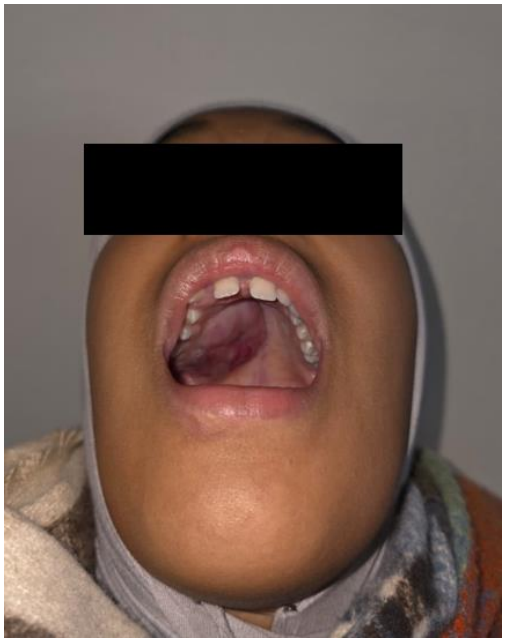

Figure 1. Intraoral clinical appearance. The right palatal mass measures approximately 4 cm, is soft and well-demarcated with mucosal telangiectasia, and crosses the midline. No surface ulceration is present.

Cervical palpation revealed bilateral jugulocarotid lymphadenopathy. The right-sided dominant node measured approximately 2 cm and was mobile and painless; a nodal cluster of similar characteristics was found in the left jugulocarotid chain.

An incisional biopsy was performed; histopathological analysis returned a diagnosis of low-grade mucoepidermoid carcinoma. Cervicothoracoabdominopelvic CT was then obtained for staging. Imaging demonstrated a 40 × 27 × 24 mm heterogeneous hypodense tissue process centered on the right hard palate, associated with lytic and reactive bone changes.

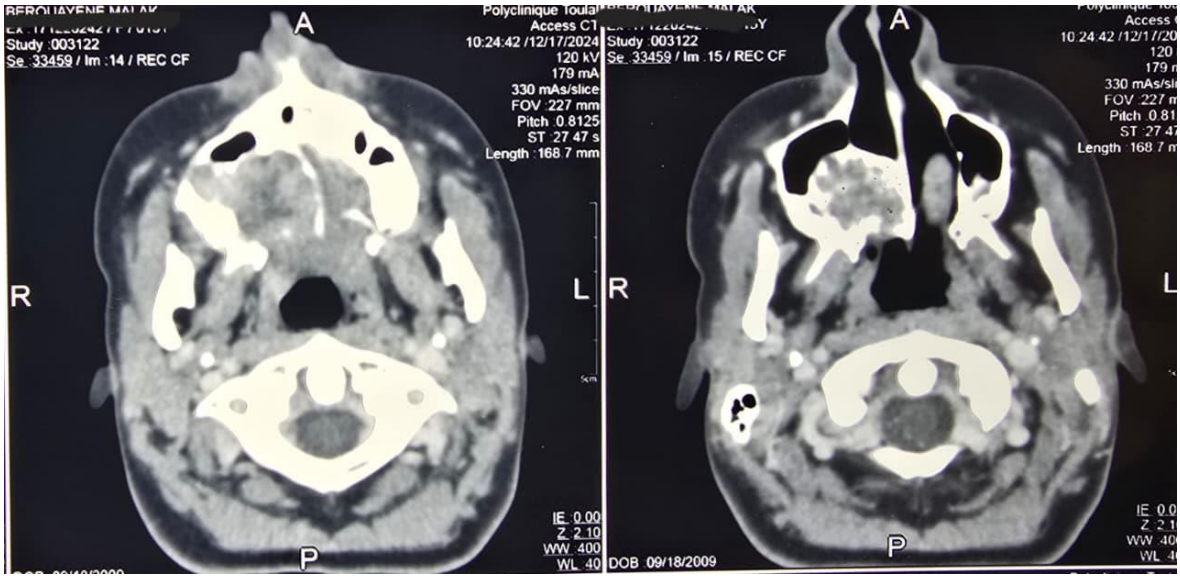

Figure 2. Pre-operative axial CT [soft-tissue window]. The 40 × 27 mm heterogeneous hypodense mass involves the right hard palate with associated lytic bony changes.

The tumor extended superiorly toward the inferior turbinate, nasal septum, and right choanae, and laterally toward the dentate portion of the right maxilla. Bilateral lateral cervical adenopathy was present, with the largest nodes measuring 19 mm on the right jugulocarotid chain and 22 mm in the left submandibular region. No pulmonary or abdominal metastases were identified. On the basis of clinical and imaging findings, the lesion was staged cT4b N2c M0.

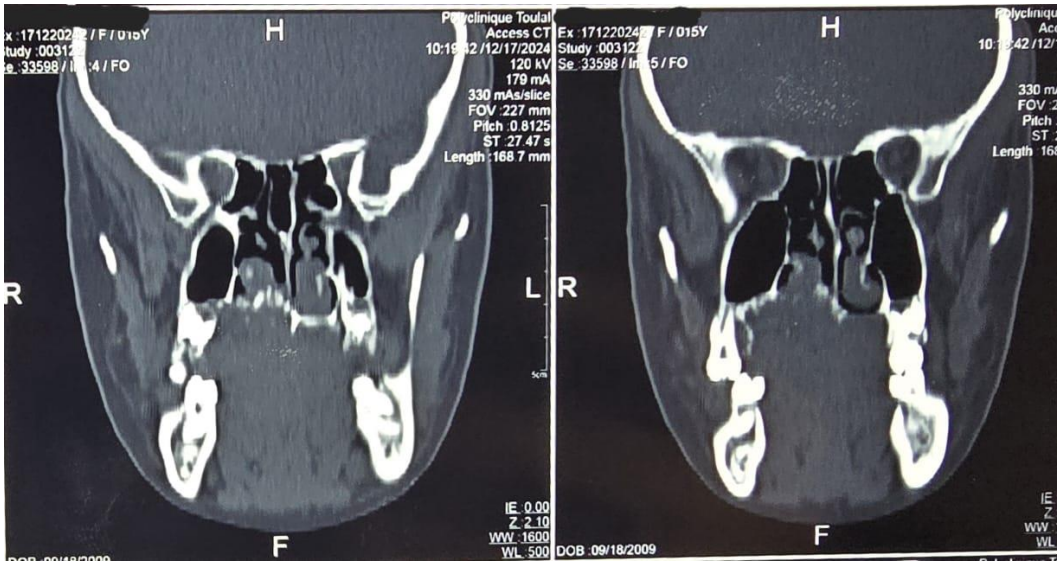

Figure 3. Pre-operative coronal CT reconstruction [bone window]. The lesion extends superiorly to involve the inferior turbinate and nasal septum, reaching the right choanae.

The case was reviewed by the multidisciplinary tumor board. The surgical plan included right hemimaxillectomy extending beyond the midline and reaching the soft palate posteriorly, with deep bony margin resections, and bilateral selective neck dissection of levels I, II, and III. The procedure was performed without intraoperative complications.

Definitive histopathological analysis confirmed an intermediate-grade mucoepidermoid carcinoma. No lymphovascular emboli and no perineural invasion were found. The deep tumoral margin and the deep bone recut margin were not free of tumor. All lymph nodes in the bilateral neck dissection specimen were negative for metastasis [0/N nodes involved on each side].

The multidisciplinary tumor board recommended adjuvant IMRT given the positive surgical margins and locally advanced staging. Palatal rehabilitation was achieved with a prosthetic obturator, as reconstructive tissue transfer was not feasible at the time of surgery.

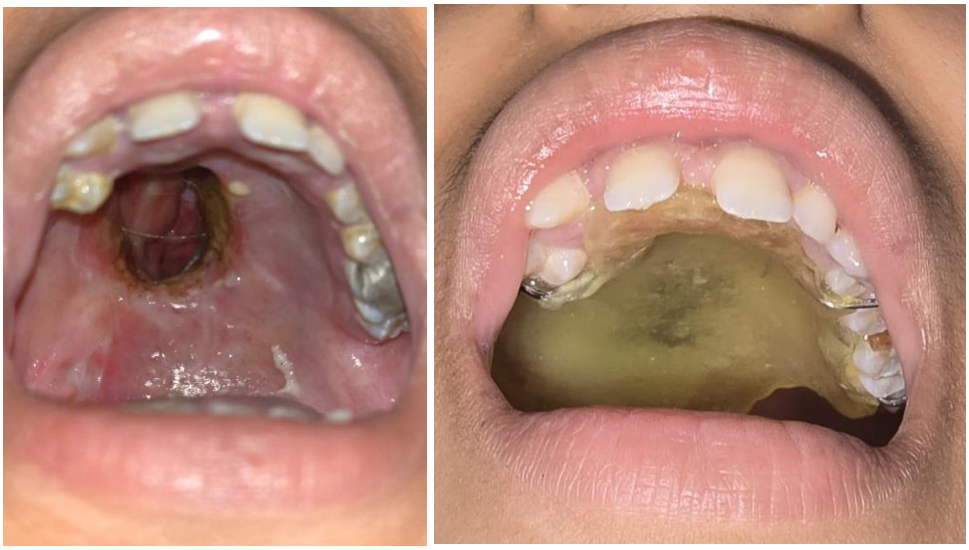

Figure 4. Post-operative intraoral view showing the palatal defect after right hemimaxillectomy and the prosthetic obturator used for oro-nasal closure and functional rehabilitation.

At one year of follow-up, the patient had satisfactory functional recovery, with no dysphagia, no significant nasal regurgitation, and no clinical or radiologic evidence of locoregional recurrence.

Discussion

MEC of the hard palate in a teenager is uncommon, and diagnosing it is not straightforward. The tumor looks and feels much like a benign cyst or vascular anomaly: it is painless, slowly growing, and covered by intact or slightly discolored mucosa. There are no reliable clinical signs to distinguish it from a mucocele, a periapical abscess drainage, or a vascular malformation without tissue sampling [6,7]. Mathew *et al.,* [8] and Jarde *et al.,* [10] both reported adolescent palatal lesions managed as benign entities for months before biopsy established the diagnosis of MEC, and Bridonneau *et al.,* [11] described two teenage girls whose lesions appeared as violaceous palatal macules, discovered almost incidentally. These reports, together with our case, point to a simple rule: any persistent palatal mass in an adolescent warrants biopsy.

What sets our case apart from most published adolescent reports is the extent of local disease at presentation. The lesion had been present for two years, was 4 cm in size, had produced cortical bone erosion with nasal cavity extension, and was accompanied by bilateral cervical adenopathy—findings that placed it at cT4b N2c M0, an advanced stage rarely seen in pediatric or adolescent MEC [2,3]. The two-year wait before presentation is most likely the key cause for this advanced stage, and it is consistent with palatal MEC's known tendency to grow slowly without causing pain or systemic symptoms even after bone invasion has begun.

Histologic grading in MEC is based on either the AFIP/Goode method [12] or the Brandwein modification [13], which assess cystic component, cell atypia, perineural invasion, necrosis, and mitotic index. The incisional biopsy in our patient gave a low-grade diagnosis, however conclusive histology of the surgical specimen revealed an intermediate grade. This disparity represents a common issue in heterogeneous salivary cancers, where insufficient incisional sample may miss a higher-grade component, resulting in an underestimation of the final histologic grade [14]. This shift has practical implications: surgeons should plan resection based on imaging extent rather than assuming that a low-grade biopsy result accurately represents the tumor's ultimate grade.

Cervical management in this circumstance warrants special attention. Despite having 22 mm of bilateral CT-positive lymphadenopathy, all excised nodes were pathologically negative. This discrepancy between radiologic appearance and histologic result is well documented in head and neck oncology, where young patients frequently have reactive and inflammatory nodes, and CT sensitivity for nodal metastases is limited [15]. The negative histology is reassuring, however the decision to undergo bilateral selective neck dissection rather than observation was appropriate given the clinical stage, T4b primary, and radiologic look of the nodes. The research [3,4] supports elective neck dissection for high-risk salivary gland carcinomas with clinically worrisome nodes.

The conventional treatment for intermediate-grade intraoral MEC is a broad surgical excision with clean margins. Li *et al.,* [9] found that margin status was one of the best predictors of locoregional recurrence in hard-palate salivary gland carcinomas. In our situation, both the deep soft-tissue and deep bone recut margins were positive, necessitating adjuvant IMRT. Radiotherapy is recommended for intermediate- or high-grade MEC with positive margins or advanced locoregional illness in the majority of reported series and current head and neck oncology guidelines [3-16]. The long-term toxicity of radiotherapy in a 16-year-old, including the danger of osteoradionecrosis, growth effects, and secondary malignancy, must be balanced against the risk of local recurrence, and this balance was openly discussed at the tumor board prior to making a decision.

Palatal reconstruction following hemimaxillectomy is best accomplished with a local or regional flap that restores the oro-nasal barrier and allows for early functional recovery. When reconstructive resources are unavailable, an obturator is a viable first-line alternative: it shuts the communication, restores intelligibility, and simplifies swallowing, while leaving the possibility of definitive flap reconstruction for a later date [11,17]. Bridonneau *et al.,* [11] found that obturator-based rehabilitation provided satisfactory functional outcomes in adolescent palatal MEC patients. At one year, our patient tolerated the device without significant functional complaints; nevertheless, a thorough speech examination and further follow-up are required before a definitive functional assessment can be established.

Conclusion

This case demonstrates that adolescent palatal MEC can present with advanced locoregional disease in the complete absence of pain or constitutional symptoms. The key practical messages are these: biopsy any persistent palatal mass; use CT for staging if large or with suspected bone involvement; recognize that incisional biopsy may underestimate grade; treat radiologic nodal enlargement as an indication for neck dissection; and plan multidisciplinary management early to achieve optimal oncologic and functional outcomes.

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