The association of a sinus tract is rare with lateral lesions. In 1 case presenting with orbital cellulitis, there was a clear opening to the sinus tract with hair emanating from the dimple.[2] A second case, similar to the current case, the child had recurrent inflammatory episodes and the diagnosis was elusive until CT imaging revealed the dermoid.[3] These 2 cases illustrate several critical points.

The presence of a sinus tract, a failure of the ectoderm to separate from the neuroectoderm resulting in a narrow passageway between the two, is a rarity in ophthalmology. In the periocular region, they are more common in the nasoglabellar region. The presence of a cutaneous dimple or papule can be an innocuous finding suggestive of a potentially deep lesion. When such a finding is encountered in conjunction with surrounding or associated inflammation, imaging is critical.

This tract likely served as a conduit for infection from the skin to the deeper orbit. The growth in culture of *P. acnes*, a nearly universal component of normal skin flora, suggests its source. There is only a single case of *P. acnes* orbital cellulitis, making this an exceedingly rare cause of this infection.[4] The antibiotics administered in this case were effective against this pathogen, although the potential for continued infection via the tract may have allowed for reinfection. It is also possible that the inflammation experienced by the patient may have been from a ruptured or leaking dermoid without infection, as can occur in a minority of patients with orbital dermoid.[5] However, the improvement after drainage (without definite excision in the first surgery), as well as a mixed infectious and inflammatory reaction on pathology, makes rupture alone unlikely.

The decision on neuroimaging in infants and young children may be fraught. The United States Food and Drug Administration has recommended that CT adhere to the principle of as low as reasonably achievable and steps are taken to achieve this in the pediatric population.[6,7] Despite this, there is evidence that the low-dose radiation received with a CT scan as a child may increase the risk of cancer development over a lifetime and this must be considered in medical decision making (Mills). The alternative, MRI, at this age requires general anesthesia for approximately 1 hour, which confers a different risk set although often considered safe.[8] In the current case, MRI was performed 3 times in this patient to limit the radiation in this infant, which may confer some anesthesia-related risk according to the United States Food and Drug Administration.[9] However, CT imaging was essential to diagnosis in this case, as the bone involvement was key to the diagnosis and treatment plan for this patient. This decision required detailed discussion with the patient's parents and the treating teams until consensus was reached.

In summary, this is the rare case of a sphenoid wing dermoid cyst presenting with osteomyelitis and adjacent orbital abscess associated with a sinus tract. The presence of a dermal pit on exam should heighten the suspicion for a dermoid, particularly in the setting of orbital cellulitis. In this case, the use of CT scan was essential to characterizing the pathology as well as for surgical planning. Although reimaging is standard with any unexpected surgical outcome, consideration of using CT should be employed to evaluate bony anatomy in select cases as is highlighted in our case report.

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Interstitial Brachytherapy for Orbital Sebaceous Carcinoma

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Abstract: **Sebaceous carcinoma is characterized by its aggressive local tumor behavior and ability to metastasize. Small periocular sebaceous carcinoma are typically treated by excision with cryotherapy. Larger tumors often require adjuvant external beam radiotherapy (EBRT) and/or exenteration surgery. When used alone, EBRT techniques typically exceed the tolerance of critical normal ocular structures. The interstitial orbital brachytherapy-boost technique permits dose escalation to the tumor bed, while minimizing radiation dose to critical normal ocular structures. Here, we present a case of orbital sebaceous carcinoma treated with excision, cryotherapy, and super-thick amniotic membrane fornix reconstruction. Then, after 3 weeks of healing, adjuvant-combined electron interstitial high-dose rate brachytherapy-boost was added to electron-beam radiotherapy to optimize the orbital**

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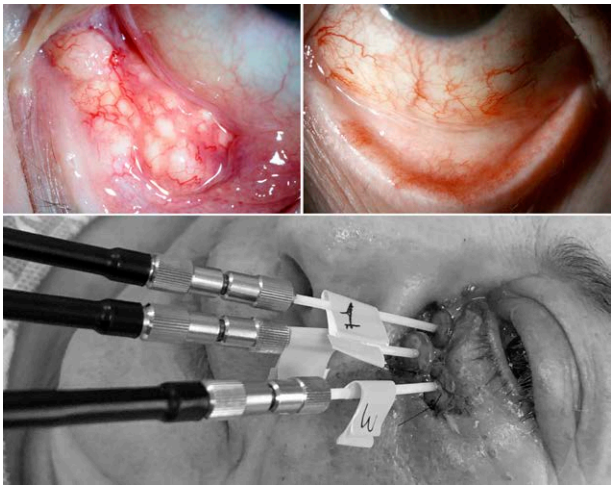

FIG. 1. Top left, slit lamp examination showing the multinodular white mass visible in the inferonasal conjunctival fornix. Top right, 1 year following (super-thick amniotic membrane graft) implantation and brachytherapy boost treatment depicting successful epithelialization of the ocular surface and no indications of local recurrence at the conjunctiva. Bottom, external photograph reveals 3 orbital brachytherapy catheters when attached to 3 high-dose rate (HDR) after-loader portals for treatment.

radiation dose distribution, increase dose to inferonasal orbit, and allow relative sparing of orbital tissues. At 1-year follow-up, there was no evidence of orbital tumor, no significant eye lash loss, normal ocular motility, no radiation retinopathy, optic neuropathy and a visual acuity of 20/20.

CASE PRESENTATION

Patient care and reporting conformed to both the Declaration of Helsinki and the Health Information Privacy and Portability Act of 1993 and written consent was obtained from the patient to disclose and publish her medical information. A 67-year-old Caucasian presented with a 2-week history of a rapidly enlarging amelanotic mass in the left medial fornix (Fig. 1, left). She had no history of prior cancer, no ocular motility disturbance and 20/20 vision in OU. Slit lamp examination revealed a multilobular elevated hyper-vascular mass, displacing the lower eyelid. It appeared to be displacing the conjunctiva along its temporal margins (Fig. 1, left). The patient reported no pain on palpation of the relatively hard tumor.

Orbital MRI showed a 1.4 × 1.3 cm mass with its epicenter in the left nasolacrimal fossa, radiographically well-defined margins and no evidence of posterior orbital or bone invasion.

Surgery consisted of the minimally invasive Finger's Aspiration Cutter Technique biopsy, a diagnosis of carcinoma leading to a request for tissue for extended analysis.[1] During excision and cryotherapy, the tumor was found to consume the inner lamella of the left lower eyelid, conjunctival fornix and extended into the orbit. Carefully dissected from the surrounding tissues, the tumor was grasped with a large "Finger-tip" cryoprobe and thus elevated to sever its posterior attachments.[2] Despite its being a nonencapsulated tumor, there was no visible or palpable residual tumor after resection. After tumor margins were treated with cryotherapy, forniceal reconstruction was performed to reconstruct the fornix and prevent symblepharon.[3,4] Therefore, a 20 × 25 mm super-thick amniotic membrane was free-hand trimmed, inserted into the surgical defect, and sewn into place with both interrupted and running 7–0 Vicryl sutures.[4]

Map biopsies of clinically uninvolved conjunctival tissues were not performed due to our being reasonably certain all the conjunctiva would need be irradiated if the pathologic assessment confirmed that the tumor was sebaceous carcinoma. Final pathologic assessment revealed an unencapsulated American Joint Committee on Cancer 8th edition, T2bN0M0 sebaceous carcinoma with positive margins. Postoperative, total body positron-emission tomography/CT revealed no residual orbital carcinoma or systemic disease.[5] In an effort to treat presumed orbital microscopic disease, adjuvant radiation therapy was advised. The risks of potential benefits of sole external beam radiotherapy (EBRT) and combination brachytherapy-boost technique were discussed.[6–8]

RADIATION TREATMENT

The radiation treatment plan was created to maximize radiation dose to the tumor bed with relative sparing of lower risk orbital tissues. Our orbital brachytherapy technique has been described.[8] In sum 3 percutaneous catheters were placed along the inferior orbital rim in the meridians of the primary tumor (Fig. 1, bottom). Each catheter was separated by 1 cm of skin, advanced 4 cm into the orbit and held in place using brachytherapy buttons sutured adjacent to the skin. HDR was delivered using a remote after loader and iridium-192 source. A total 2000 cGy was delivered in five bid 400 cGy fractions, separated by a minimum of 6 hours. Once completed, catheters were removed under peribulbar xylocaine anesthesia (Fig. 2, top).[9] One month later, 36 Gy in 180 cGy daily fractions using a 9 MeV en face electron field with a custom bolus cutout was delivered to the anterior orbital structures (Fig. 2, bottom). The HDR brachytherapy combined with EBRT for total cumulative dose of 56 Gy.

One year after irradiation our patient's visual acuity was 20/20 and dry eye treatable with tear supplements (Fig. 1, right). There was no significant keratopathy, iris neovascularization, cataract, radiation retinopathy, or optic neuropathy. However, despite complete local control she developed a sebaceous carcinoma positive cervical lymph node treated with supraomohyoid dissection without adjuvant radiation therapy.

DISCUSSION

This case demonstrates that interstitial brachytherapy with overlay EBRT can be used to treat select cases of orbital sebaceous carcinoma. Compared with 6 MV or electron-based EBRT alone, brachy-boost increases irradiation of the tumor bed along with relative sparing of surrounding critical structures. This offers a method to preserve the eye and vision. The use of super-thick amniotic membrane forniceal reconstruction was used to prevent symblepharon.[4]

Sebaceous gland carcinoma is characterized by aggressive local behavior, skip lesions, regional nodal, and distant metastasis.[7,8] Thus, primary local excision is considered insufficient to effect control, due to residual disease and/or microscopic spread. Hence, radiation therapy has been used to extend surgical margins.[5,10] Orbital sebaceous carcinomas have been treated with EBRT doses of 45–63 Gy that typically exceed the tolerance of critical normal ocular structures leading to severe dry eye, conjunctival keratinization, keratopathy, cataracts, optic neuropathy, retinopathy, and loss of vision. Brachytherapy boost offers a method to improve orbital radiation dose distribution, increase the dose to the tumor bed while reducing dose to critical normal ocular structures. Electron-based EBRT limits treatment to the posterior orbit (optic nerve and macula). Strege et al. reported in a study of 10 children with refractory orbital rhabdomyosarcomas that intensity-modulated brachytherapy

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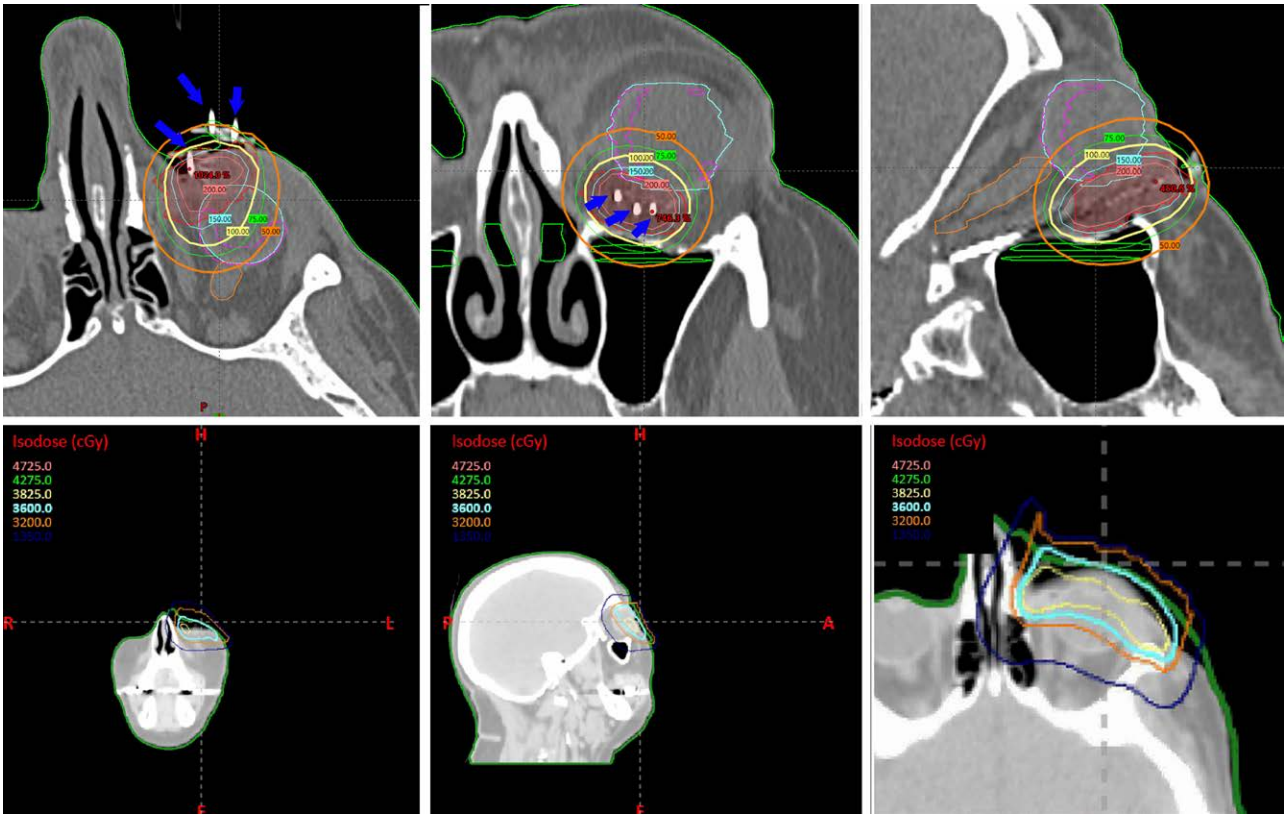

FIG. 2. Top, computed axial tomography shows placement of orbital brachytherapy catheters (blue arrows) and surrounding isodose curves depict the iridium-192 "brachy-boost" dose volume. Bottom, computed axial tomography with electron-based EBRT overlay (lower right), a focused transverse view of EBRT field and dose-key. EBRT, external beam radiotherapy.

using a remote-after loading system improved local tumor control and functional outcomes by allowing for application of various intensities of radiation.[11] In a retrospective analysis of the results of a clinical case series of patients who underwent postenucleation HDR interstitial brachytherapy, Finger et al. reported 9 patients who tolerated a target dose of 32.85 Gy delivered in 9–10 twice daily fractions. At a median follow-up of 18 months (range, 1–62 months), there was no orbital recurrence and no significant acute or long-term radiation side effects.[9] A case report by Tagakawa et al. showed that high-dose rate interstitial brachytherapy (HDR-ISBT) of 54 Gy in 9 fractions for a bulky 4.5 × 2.9 × 2.5 cm sebaceous carcinoma of the upper eyelid achieved excellent locoregional control at 18 months after HDR-ISBT.[12] The present case demonstrates how tailored orbital radiation dose delivery can result in local disease control, functional outcomes, and excellent cosmesis.

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Double Frost Suture Technique for Simultaneous Skin Grafting of the Upper and Lower Eyelids

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Abstract: **The double Frost suture is a useful supplement to the reconstruction of ipsilateral upper and lower**

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