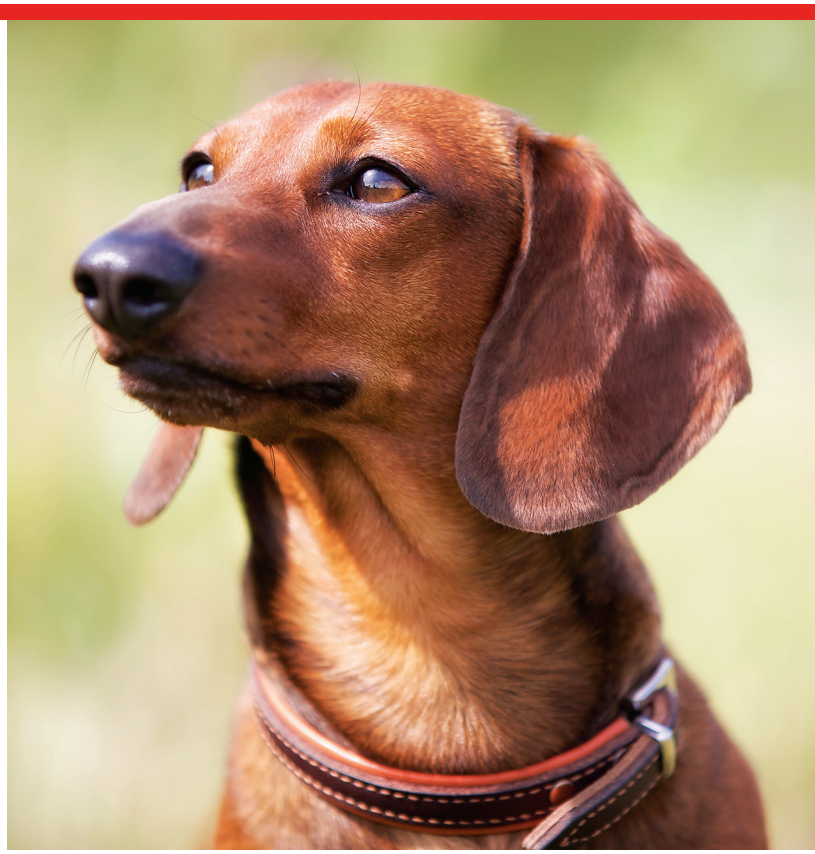
Cutaneous Melanoma in a Dachshund



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Buster, a 7-year-old neutered male dachshund, was presented for evaluation of a pigmented, nonhaired growth <1 cm in diameter of a month's duration near his left eye. Although the mass was not painful, it was superficially ulcerated and Buster scratched at it often. The mass was incompletely excised from near the left medial canthus and submitted for histopathologic evaluation. Excision was incomplete to avoid disrupting the eyelid margin.

Buster was diagnosed with cutaneous melanoma based on histopathologic evaluation of the excised mass, which was determined to be malignant based on its mitotic index (MI) of 10, as cutaneous melanoma with an MI >3 is considered to be malignant.[1-3] According to the biopsy report, the tumor tissue was composed of sheets of pigmented and nonpigmented atypical mesenchymal cells arranged in storiform patterns in the dermis. Nuclei were round-to-oval, with few distinct prominent nucleoli. Many tumor cells contained melanin granules. Radiation therapy (RT) for the incompletely excised melanoma was initially recommended; however, because of concern for damage to the eyes from external beam radiation due to the close proximity of the tumor to the eye, Buster was referred to a local university hospital for strontium 90 RT.

Adjunctive plesiotherapy with strontium 90 uses β-particle emissions to deliver radiation directly to the skin. Unlike gamma-particle RT, which is used with external beam RT, β-particle RT provides the required surface dose of radiation but has a rapid decrease of the dose beneath the surface of the skin, as β particles only penetrate a few millimeters into the skin, making β-particle RT appropriate only in cases of very superficial inflammatory or neoplastic lesions. Only minimal shielding is required with β-particle RT due to the inability of β particles to penetrate even thin layers of

MI = mitotic index
RT = radiation therapy

steel; this allows for precise treatment with high doses of radiation to small and superficial lesions.

Physical Examination

On presentation for strontium 90 RT, Buster was bright, alert, and responsive. No significant abnormalities were identified, with the exception of moderate dental tartar and a small scar on the medial canthus of the left eye where the primary tumor had been removed.

Diagnosis & Staging

There was no obvious mass at the site of the primary tumor. Regional lymph nodes were palpated and were normal. Lung sounds were also normal. Staging was performed and included aspiration of the regional submandibular lymph nodes and 3-view thoracic radiography, which was normal. Buster was determined to have stage I cutaneous melanoma. Advanced imaging (ie, CT) to include the retropharyngeal and periorbital lymph nodes was declined by the owner. Minimum database (ie, CBC, serum chemistry profile, urinalysis) was also normal.

Although melanoma was easily diagnosed via histopathology in Buster's case, histopathology may not be enough to confirm a diagnosis of melanoma. In such cases, immunohistochemical stains may be necessary to make a definitive diagnosis.[1]

Treatment & Long-Term Management

Buster was premedicated for strontium 90 treatment with butorphanol (0.2 mg/kg IM), induced with propofol to effect, and intubated. Anesthesia was maintained using 1.5% to 2% isoflurane inhalant. A 1.8-cm strontium 90 probe was placed over the scarred area and maintained for 6 minutes and 53 seconds to deliver a total dose of 100 Gy to the surface of the skin.

At the recheck examination 2 weeks after RT, a white scab over the treated area, mild blanching of the skin, and mild moist desquamation were observed, all of which resolved after an additional week of supportive care.

Adjuvant therapy, including carboplatin chemotherapy and the melanoma vaccine, was recommended to address potential metastatic disease but was declined. Continued monitoring for evidence of local recurrence and metastatic disease with physical examinations, regional lymph node evaluations, and thoracic radiography for the next 3 years was also suggested but declined (see ***Treatment at a Glance***).

Continues ▶

Patients with incompletely excised, malignant cutaneous tumors should be treated with additional surgery or local radiation therapy.

TREATMENT AT A GLANCE

- Complete surgical excision is the mainstay of treatment and is curative in approximately 80% of patients with cutaneous melanoma.[7,9]
- Patients with incompletely excised, malignant cutaneous tumors should be treated with additional surgery or local RT.
- Malignant tumors not amenable to surgical excision may be treated with local RT alone (typically 6 fractions of 6 Gy each).[10]
- Adjuvant therapy should be considered for malignant melanomas of the skin. Adjuvant therapy can include radiation of locoregional lymph node beds and sentinel lymph nodes,[10] carboplatin chemotherapy,[11] and immunotherapy (ie, melanoma vaccine).[12]
- Monitoring programs should be implemented after therapy for patients with tumors deemed malignant. Monitoring should include physical examination, thoracic radiography, regional lymph node evaluation, and evaluation of any new masses.

TAKE-HOME MESSAGES

- Cutaneous melanoma comprises 4% of all skin tumors in dogs, of which 80% to 90% are benign and 10% to 20% are malignant.[7,9]
- The following histologic features have been associated with a more aggressive clinical course[1]:
  - MI >3
  - More than 20% of cells displaying nuclear atypia
  - Low degree of cell pigmentation
  - Expansion beyond the dermis
  - Ulceration of the overlying epithelium
  - Ki67 expression in >15% of cells
- Histopathology and, possibly, a melanoma prognostic panel (see ***Suggested Reading***) should be used to determine the prognosis of the mass.
- Up to 40% of lymph nodes in patients with metastatic melanoma are normal in size, so lymph node aspiration should be conducted for proper staging.[13]
- The metastatic rate for malignant melanoma has been reported to be 40% to 60%, regardless of primary location.[3,7,8,14]
- At minimum, proper staging should include baseline minimum database (eg, CBC, serum chemistry profile, urinalysis), regional lymph node aspiration, and 3-view thoracic radiography. Advanced imaging (eg, CT, MRI) may be warranted for some mass locations (eg, oral cavity, pharynx, rectum, anal sac, other internal organs not immediately accessible to physical examination). In addition, CT-guided sentinel lymph node mapping has been proven to be beneficial in humans and may therefore be prognostically useful for staging in dogs.[15]

RELATED ARTICLE

See accompanying article, **Management of Cutaneous Melanoma**, on page 32.

MI = mitotic index

Prognosis & Outcome

Most cases of cutaneous melanoma diagnosed on haired skin are benign; however, cutaneous melanoma associated with a mucocutaneous junction, a nail bed, or the oral cavity is often malignant and has aggressive clinical behavior. Melanomas arising from haired skin can occasionally be malignant with an aggressive clinical course (≈12% of melanomas from haired skin)[4]; thus, all pigmented or partially pigmented skin masses that are removed should be submitted for histopathologic evaluation to determine the surgical margins, MI, and any additional features of malignancy.

Dogs with benign cutaneous melanoma are typically younger (median age, 8.1 years) than those with malignant melanoma (median age, 11.6 years) at diagnosis.[4] A better prognosis for cutaneous melanoma is generally associated with an MI <3, <20% of cells displaying nuclear atypia, a higher degree of pigmentation (>50% of cells), containment within the dermis, no ulceration of overlying skin, and a Ki67 score of <15% (out of 500 counted cells).[5] The median 2-year survival rate in dogs with cutaneous melanoma is 84%, unless the tumor is associated with a digit (median 2-year survival rate, 56%).[2] In another study, ulceration of cutaneous masses was associated with a significantly shorter survival rate, although a separate study did not find ulceration to be a prognostic factor.[2,3,6]

The prognosis for stage I cutaneous melanoma can be quite good if the MI is <3 but guarded if the MI is higher. The metastatic rate for malignant mucosal melanoma, which spreads most commonly to the lungs and regional lymph nodes, is approximately 60% (see ***Take-Home Messages***).[3,7,8]

An update provided by the owner indicated that Buster was doing well 56 months postdiagnosis, with no evidence of metastasis or spread of the original tumor, despite the high MI. No additional therapy was performed during this 56-month period.

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Suggested Reading

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