Rodent Oncology

Diseases, Diagnostics, and Therapeutics

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KEYWORDS

• Rodent • Oncology • Guinea pigs • Chinchillas • Hamsters • Mice • Rats • Gerbils

KEY POINTS

- Certain rodent species, such as rats and mice, are more commonly diagnosed with neoplasia compared with other rodents like chinchillas and degus, which seemingly have much lower reported cancer incidence rates.
- Treatment of most rodent neoplasia revolves around surgical excision; however, reports of pharmacologic intervention exist and this is an area of expanding interest.
- All surgically resected tumors should be submitted for histopathologic evaluation to confirm the diagnosis and establish the need for adjuvant therapy.

INTRODUCTION

A general discussion of the most common spontaneous tumors of the pet rodent population, including clinical presentation, diagnostic evaluation, and therapeutic options, is covered in this article. This article is not intended as an all-inclusive review of every tumor histotype that has been reported, but is a review to stimulate exotic animal practitioners to proactively investigate, treat, and report cases of neoplasia. For the purpose of this article, the nomenclature rodent is used to refer to guinea pigs, chinchillas, hamsters, mice, rats, gerbils, degus, and prairie dogs.

GUINEA PIGS (*CAVIA PORCELLUS*)

Tumors of the Skin and Subcutis

Skin tumors comprise approximately 15% of all neoplasms seen in guinea pigs.[1] The most common skin tumors, accounting for 33% to 89.7% of all skin tumors, are trichofolliculomas (an abortive differentiation of cutaneous pluripotent stem cells toward hair

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follicles).[2,3] These tumors have a tendency to occur on the dorsum, but can arise anywhere on the body. Although these tumors are benign, they can grow large enough to precipitate ulceration and/or rupture.[1,2] Fine-needle aspiration and cytology can reveal significant heterogeneity depending on the area of the tumor sampled, but often keratin, sebum, scant amounts of inflammatory cells, and blood are seen.[4] Complete surgical excision, including removal of the capsule, is considered curative (**Figs. 1** and **2**).[5]

Lipomas are also common in guinea pigs, with an incidence of 25% of all cutaneous tumors reported.[2] Lipomas typically occur on the ventral abdomen, but can occur anywhere on the body. They can be solitary or multifocal.[4] Fine-needle aspiration, incisional biopsy, or complete excisional biopsy can be used to differentiate a benign lipoma from other neoplasia, such as mammary tumors, that may be malignant.[2] Surgical removal of a benign lipoma may be performed for cosmetic purposes or if, as a result of size and position, it is impeding normal ambulation or bodily comfort.

Additional cutaneous tumors that have been reported in guinea pigs include trichoepithelioma (differentiation into all 3 segments of the hair follicle), sebaceous adenoma, fibrosarcoma, lymphoma, and liposarcoma.[2,6–10] Histopathology is required for definitive diagnosis of all cutaneous tumors (**Figs. 3** and **4**).

Tumors of the Mammary Gland

Mammary gland tumors can occur in both boars and sows.[1,5,9] Approximately 30% to 50% of mammary tumors in guinea pigs are malignant, but their metastatic rate is reportedly very low.[1,9] Adenomas and adenocarcinomas are the most common benign and malignant mammary tumors, respectively.[1,5] Several other histologic types of benign and malignant mammary tumors in guinea pigs have been identified.[11] A 2010 retrospective report immunohistochemically evaluated 10 mammary tumors and histologically classified the tumors based on the World Health Organization (WHO) *Histological Classification of Mammary Tumors of the Dog and Cat*.[11,12] Out of the 10 mammary tumors assessed, 7 (70%) were malignant and 86% of these were determined to be simple tubulopapillary carcinomas.[11] All of the tumor samples expressed type alpha estrogen receptors and progesterone receptors.[11]

Mammary tumors must be differentiated from other pathologic lesions that can occur in that area, such as mastitis and lipomas.[2,9] A fine-needle aspiration may be

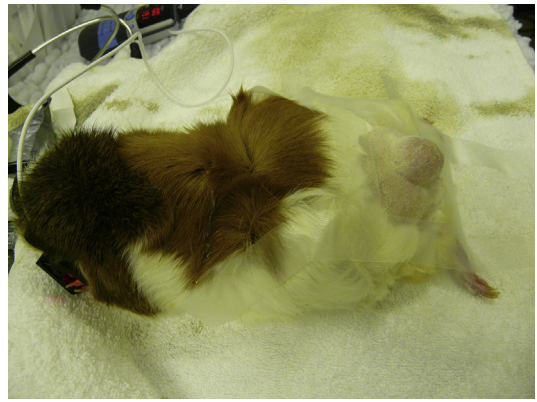

Fig. 1. Trichofolliculoma on the dorsum of a guinea pig. (*Courtesy of* David Eshar, DVM, Dipl. ABVP (Exotic Companion Mammals), Dipl. ECZM (Small Mammal), Manhattan, KS.)