SPONTANEOUS MAMMARY FIBROADENOMAS IN AWISTAR RAT COLONY

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ABSTRACT

Necropsy examination was conducted on two adult female Wistar rats, aging 16 and 18 months that were presented with a history of a gradually increasing mass in their lower abdominal region. Gross examination revealed firm, hard, localized, well-encapsulated masses in the inguinal pair of the mammary glands. Microscopically, the acinar structures were surrounded by distinct interlobular and intralobular connective tissues. Acini were of varying shapes and sizes and irregularly placed among the fibrous stroma. The histological pattern and the nature of the tumour in older female rats were sufficient to confirm the diagnosis as mammary fibroadenomas.

Key words : Mammary fibroadenoma, Wistar rat.

Mammary fibroadenomas have a relatively common occurrence in aged female Wistar rats with a high incidence rate of 63% (Barsoum et al., 1984). Several factors greatly influence the growth of spontaneous mammary neoplasms in the rat. These include genetic factors, age, physiological, hormonal status (Mann et al., 1996), levels of fat in the diet, macro-environmental conditions such as temperature and humidity, bedding materials, frequent handling and stress (Gopinath, 1996). Regarding their biological attribute, fibroadenomas grow slowly, become large, and weigh as much as the rest of the animal. They can infiltrate locally but are rarely metastatic (Percy and Barthold, 2007). The present report documents the spontaneous occurrence of two cases of mammary fibroadenoma in a female Wistar rat colony.

CASE HISTORY:

Two adult female rats of Wistar strain aged 16 and 18 months, maintained in the Laboratory Animal Medicine Unit, Directorate of Centre for Animal Health Studies, Tamilnadu Veterinary and Animal Sciences University, Madhavaram Milk Colony, Chennai had a gradually increasing mass in their lower abdominal region. Complete necropsy was performed on the two rats and representative tissues were fixed in 10% formalin. The tissues were embedded in paraffin and 5 μm thin sections were prepared and stained with haematoxylin and eosin for histopathological evaluation. The animals were presented with the history of progressively increasing mass in the lower abdominal region. Regarding their housing conditions, the animals were placed in polypropylene cages with ad libitum access to standard rodent pellet feed and water and maintained under strict macro-environment conditions of temperature (22°-26°C), relative humidity (55-60%) and light (12h:12h of alternating dark and light cycles).

Gross examination revealed well-encapsulated, circumscribed, localized, movable, hard, large firm mass adhering to the skin of the last abdominal pair (inguinal pair) of the mammary gland (Fig. 1). The masses weighed 28g and measured 6 x 5 x 3cm approximately. On cut surface, the masses had a rubbery consistency and
a brownish grey smooth, glistening, lobulated appearance. Microscopically, the lesions were characterized by proliferation of varying degrees of inter-lobular and intra-lobular connective tissue fibers (Fig. 2). Scattered acinar structures of varying shapes and sizes were seen among the fibrous stroma. Variable proportions of acini and fibro-collagenous components were identified throughout the mass. Cuboidal epithelial cells filled with prominent cytoplasmic vacuoles lined the acini. Lymph nodes did not show any abnormalities on microscopical examination. The histopathological features and the characteristic nature of the tumour in aged female rats were adequate to support the diagnosis as fibroadenomas.

Morphological and histopathological characteristics of the present cases agree with the earlier reports (Gulbahar et al., 2007; Percy and Barthold, 2007). The incidence of fibroadenomas in the present study may be due to advanced age and hormonal status. Reproductive senescence (biological aging) in female rats is characterized by a state of persistent estrus (Thayer and Foster, 2007). Therefore, high levels of estrogen could be a causal factor in advancing the fibroadenomatous changes. The results agree with that of Percy and Barthold (2007) who reported a decrease in occurrence of fibroadenomas in ovariectomised rats. Factors such as high fatty diet and lighting systems also play a role possibly by altering the endocrine patterns resulting in spontaneous formation of mammary tumors. Clement, (1980) suggested that a high-fat diet could provide a favorable environment for the proliferation of tumor cells by way of induction and maintenance of hormone receptors in the rat mammary gland. Gopinath (1996) also opined that a high fat diet fed to mice resulted in increased incidences of mammary tumors. Though mammary adenomas are relatively innocuous, death in these Wistar rats might be due to the heavy weight of the mass making the animal immobile, subsequently developing inanition and death.

REFERENCES