Mammary Gland Adenocarcinoma in a Mandrill (Mandrillus sphinx)

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ABSTRACT. A 22-year-old female mandrill (Mandrillus sphinx) with continuously growing mass at the right mammary gland area was found dead, and a postmortem examination was performed. At necropsy, an elevated firm subcutaneous mass about 5 cm in diameter was present at the right mammary gland area. Axillary, mediastinal, and tracheobronchial lymph nodes were enlarged 2 to 4 times their normal sizes. Numerous metastatic foci 2 to 5 mm in diameter were scattered in the lung. Histologically, the tumor was diagnosed as mammary gland adenocarcinoma. Metastasis to the regional lymph nodes and lung was also confirmed. This is the first reported case of a mammary gland tumor in mandrill in Asia.

KEY WORDS: mammary gland tumor, Mandrillus sphinx.

Mammary gland tumor is one of the common types of tumors in dogs, cats, mice, and rats and is the second most lethal form of cancer in women in United States [5, 7]. Only 29 cases of spontaneous mammary gland tumor in nonhuman primates have been reported in the literature [1, 8, 9]. Here, we describe a spontaneous mammary gland adenocarcinoma in a mandrill (Mandrillus sphinx). This is the report of first such case in Asia.

The subject of this paper was a 22-year-old female mandrill that has been kept in outdoor exhibits at the Everland Zoological Garden, Korea. The clinician first noted a firm palpable mass (0.5 by 1 cm) at the right mammary gland area. The mass continued to grow to a size of 4 by 3 cm in 4 months and became inflammed and perforated. A wedge biopsy sample of the mass, submitted to the School of Veterinary Medicine, Seoul National University, was histologically diagnosed as adenocarcinoma, which probably originated from the mammary gland. The monkey was unresponsive to chemotherapy and antibiotic therapy and died 2 months after the commencement of the therapies. Shortly after death, the monkey was submitted to the School of Veterinary Medicine, Seoul National University for postmortem examination.

At necropsy, an elevated firm subcutaneous mass approximately 5 cm in diameter was noted in the right mammary gland area, and the overlying skin was ulcerated and perforated. The mass was tightly adhered to the surrounding connective tissues (Fig. 1). Mediastinal, axillary, and tracheobronchial lymph nodes were enlarged about 2 to 4 times their normal sizes. Numerous 2 to 5 mm tan, firm miliary foci were scattered throughout the lung. Mammary mass, lymph nodes, and other major parenchymal organs were collected, fixed in 10% neutral buffered formalin, and processed using a routine method for light microscopic examination.

Microscopically, the neoplastic mass consisted of sheets of acinar structure lined with a single to often multiple layers of cuboidal epithelial cells and lobulated by fibrovascular stroma (Fig. 2). The neoplastic cells had indistinct cell borders and contained round to oval vesiculated nuclei with prominent nucleoli and small to moderate amounts of cytoplasm. Mitotic index was low (0 to 2 in ×400 field). Scattered areas of necrosis and hemorrhage, and lymphohistiocytic and plasma cell infiltrations were also noted in the neoplastic mass. The mass infiltrated extensively into the underlying muscle layer (Fig. 3), and the tumor cells were often observed in the vasculature (Fig. 4). The epidermis was heavily inflammed and focally ulcerated. The sinuses of the enlarged lymph nodes were mostly dilated and filled with clusters of neoplastic cells. Normal architecture of the...
lymph nodes was obliterated and replaced by neoplastic cells as noted in the mammary gland. Numerous metastatic foci were noted in the lung (Fig. 5). The tumor was diagnosed as infiltrating lobular type mammary gland adenocarcinoma based on the anatomical location of the mass and light microscopical features.

Unlike human, mammary gland adenocarcinoma is extremely rare in nonhuman primates. So far only 29 spontaneous cases have been reported, all of which were from Old World monkeys [1, 8, 9], probably due to the fact that majority of the monkeys are killed immediately after research. In mammary gland tumor of nonhuman primates, malignant form occurs more frequently than benign form, and, clinically, the tumor tends to be fairly aggressive, frequently metastasizing into the lung, liver, and regional lymph nodes [10]. Furthermore, mammary gland adenocarcinoma with metastasis to the brain has been documented in a Sumatran orangutan (Pongo pygmaeus abelii) [2].

The cause of this neoplasm and those of the 29 spontaneous cases reported previously have not yet been determined. Mammary gland tumor was experimentally induced into macaques following hormone treatment or radiation [3, 6]; however, direct cause and effect relationship could not be demonstrated in any of these cases either. In 1970, type D retrovirus, designated as Mason-Pfizer monkey virus, was isolated from the mammary neoplasm of a female rhesus macaque [4]. Recently, mammmary adenocarcinoma was also reported in a male squirrel monkey (Saimiri sciureus) [9]. In humans, for every 100 females with breast cancers, 1 male patient is reported [11].

Although rare, mammary gland tumor should be considered as a differential diagnosis for subcutaneous mass at the mammary gland region. More numerous cases need to be documented to evaluate incidences and prevalences as well as possible etiologies of the mammary gland tumor in nonhuman primates.

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REFERENCES


