Scientific Report

Spontaneous differentiated squamous cell carcinoma of cheek pouch in a Syrian hamster

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Summary

A 2-year-old male hamster was presented because of left facial swelling and salivation. Necropsy was performed and affected cheek pouch with tissue samples of regional and internal organs were submitted for histopathological study. In histopathological examination it was found that the tumor consisted of cords and islands of tumoric epithelial cells which were diffused in the dermis. Vacoulation of cytoplasm in many cells were striking features. The lesion was infiltrated by mononuclear cells. These findings were consistent with differentiated squamous cell carcinoma, which restricted only to the left cheek pouch. There was no evidence of tumoral invasion to the other organs. Cheek pouch spontaneous tumors in hamsters have been rarely reported.

Key words: Squamous cell carcinoma, Syrian hamster, Cheek pouch

Introduction

Hamsters have bilateral, well-developed cheek pouches that are lined by a thin epithelial membrane and used to store extra food (Bennett and Mullen, 2004). Eversion and impaction are the two most common conditions in hamster's cheek pouch (Richardson, 2003). Cheek pouch neoplasia is extremely rare in hamsters. Literature review indicates that there is only one report of cheek pouch squamous cell carcinoma (SCC) in dwarf hamsters (Martorell *et al*., 2005). Also, because of using hamsters in research, experimentally induced tumors in cheek pouch of these small mammals are widely reported (Ohtake *et al*., 1993), but spontaneous tumors in cheek pouch have been rarely reported. The present study describes the cheek pouch spontaneous squamous cell carcinoma in a Syrian hamster.

Case history

A 2-year-old male hamster was presented because of progressive left facial swelling and salivation (Fig. 1). The owner reported that the animal just had difficulty in eating his daily food, otherwise the animal was normal and no sign of systemic illness was seen in general examination. Fine needle aspiration of facial mass did not reveal any exudative fluid. The owner refused further investigation and the animal was euthanatized. In necropsy, a well encapsulated, 0/75 × 0/75 cm, grayish-pink solid mass consisted of multiple lobules was observed. A complete set of tissue samples such as regional and internal lymph nodes, tonsils, salivary glands, spleen, liver, lung, kidneys, small and large intestine were submitted for histopathological examination. The selected specimens were fixed in 10% buffered formalin (pH = 7.2), then sectioned in 5 µm and stained with hematoxylin and

eosin. Microscopic examination revealed that the tumor was composed of irregular cords and islands of epidermal cells that proliferated downward and spread through the dermis (Fig. 2). Tumor cells had abundant eosinophilic cytoplasm with ill-defined border and the intercellular bridges between these cells were disappeared. Vacoulation in cytoplasm of some individual cells were occurred (Fig. 3). The vesicular nuclei were round and 1-2 prominent nucleoli were observed. There were only a few concentric layers of squamous cells (horn pearls) that produced the keratin in their centers. Nuclear pleomorphism was striking, but mitotic figure was rare in this lesion. The massive infiltration of inflammatory cells and large proliferation of mesanchymal cells (schirrous) as well as massive necrosis obscured the broad surface of lesion. There was no evidence of tumoral invasion to the other organs.

Discussion

In the presented case, facial swelling and salivation were the main clinical findings at admission. Several disorders such as impaction, abscess and tumors should be differentiated in these cases. Needle aspiration of swelling will differentiate between impaction and abscessation (Richardson, 2003). The incidence of spontaneous tumors in hamsters is relatively low. The majority of tumors are benign and frequently arise from the endocrine system or alimentary tract (Hrapkiewicz and Medina, 1998). Reports vary from 4% as an overall population incidence to 50% or more in hamsters over 2 years of age. Although spontaneous neoplasia is uncommon in hamsters, these animals are remarkably susceptible to a wide range of experimentally induced tumors. The hamster's eversible cheek pouch is relatively an immunologically protected site for tumor transplantation (Harkness and Wagner, 1989). Squamous cell carcinomas are relatively common in the oral mucosa of adult dogs and cats, but occur less frequently in other species (Carton and McGavin, 1995). Naturally occurred cheek pouch squamous cell carcinoma was only reported

Fig. 1: Left facial enlargement resulted in malocclusion of incisors. (Arrows show tumor mass in the presented hamster)

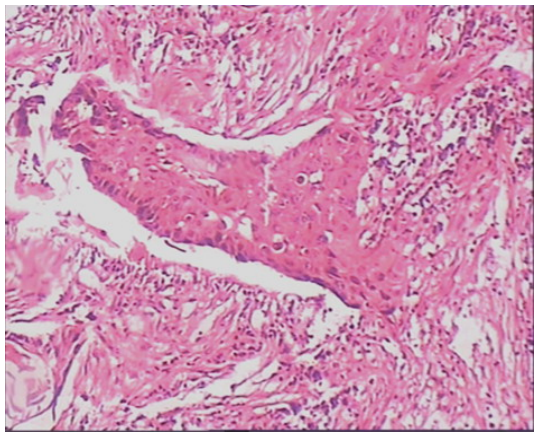

Fig. 2: The squamous epithelial cells of SCC are invading the dermis, and are arranged in cluster (cell nest), have hyperchromatic nuclei. The laminated sheet of deeply eosinophilic keratinized epithelial cells is conspicuous, (H&E, ×100)

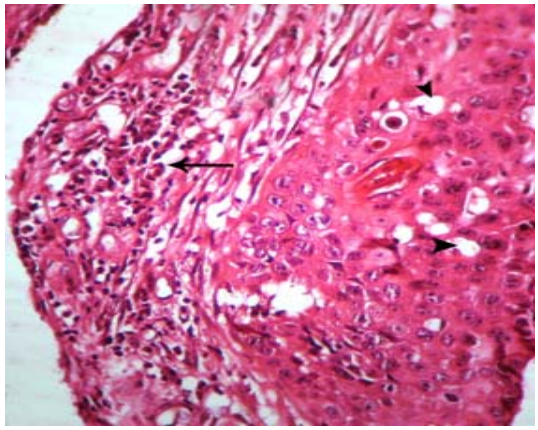

Fig. 3: The carcinoma of epithelium showing nuclear pleomorphism, vacoulation of cytoplasm (arrow heads) and infiltration of mononuclear cells in the stroma (arrow), (H&E, ×400)

in two dwarf hamsters (Martorell *et al*., 2005). In previous report, SCC was associated with eversion of affected cheek pouch, but it was not seen in our case (Martorell *et al*., 2005). Although lymph node metastasis have been observed in the hamster cheek pouch carcinoma model (Ohtake *et al*., 1993), no clinical evidence of tumor metastasis was observed in the present case. In conclusion, the most common challenge face veterinarians interested in treating pet rodents is financial restriction. So, most people who choose rodents as pets do not spend much attention on veterinary care. This reduces diagnosis of unusual diseases in these animals. However, in cases which their owners refuse further investigations, necropsy and histopathological findings can provide useful information for practitioners.

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