



## CASE REPORT

### Spontaneous lymphoma in a Golden hamster (*Mesocricetus auratus*)

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#### Özet

**Kheirandish R, Akhtardanesh B, Askari N.** Bir Golden hamsterda (*Mesocricetus auratus*) spontan lenfoma. **Eurasian J Vet Sci, 2013, 29, 1, 50-52**

Mevcut klinik olguda, bir Golden hamsterda spontan lenfoma olgusu tartışıldı. Veteriner hastanesine iki haftadır süren kilo kaybı, iştahsızlık, ishal ve servikal lenf nodüllerinde belirgin şişkinlikle karakterize erkek hamster getirildi. Fiziksel muayenede yaygın lenfadenomegali ve dehidrasyon belirlendi. Periton içi hidrokortizon ve dekstroz uygulamaları yapılmasına rağmen hasta öldü. Nekropside bütün süperfisyal lenf yumrularında önemli büyümeler gözlemlendi. Ancak mezenterik, dalak ve karaciğer lenf yumrularının normal olduğu gözlemlendi. Diseke edilen lenf nodülleri merkezinde nekrozlar tespit edildi. Histopatolojik incelemede orta derecede mitotik indeksli büyük veziküler çekirdek içeren lenfoid hücreler belirlendi. Mevcut bulgular diffuz büyük B hücreli lenfomalı non-Hodgkin tanısını koydurdu. Laboratuvar hayvanlarında deneysel lenfomalar yapılmasına rağmen hamsterlarda spontan lenfomalar çok nadir gözlenmektedir. Mevcut klinik rapor spontan lenfomanın klinik ve histopatolojik varlığını tanımlandı.

**Anahtar kelimeler:** Spontan lenfoma, golden hamster, histopatoloji

#### Abstract

**Kheirandish R, Akhtardanesh B, Askari N.** Spontaneous lymphoma in a Golden hamster (*Mesocricetus auratus*). **Eurasian J Vet Sci, 2013, 29, 1, 50-52**

In this clinical report, occurrence of a spontaneous lymphoma was discussed in a Golden hamster. Male hamster was referred to the veterinary hospital with a history of anorexia, diarrhea, prominent swelling of cervical lymph nodes and progressive weight loss since two weeks ago. During physical examination generalized lymphadenomegaly and severe dehydration was seen. Intraperitoneal dextrose and hydrocortisone was injected but the patient died. In necropsy, significant enlargements of all superficial lymph nodes were observed but the mesenteric lymph nodes, spleen, and liver were seemed normal. Dissected lymph nodes showed necrotized center. Histopathologic examination revealed lymphoid cells containing large vesicular nuclei with evident nucleoli which showed moderate mitotic index. On the basis of these findings, a definitive diagnosis of non-Hodgkin diffuse large B-cell lymphoma was made. Experimentally induced lymphomas have been reported in laboratory animals; however, spontaneously occurring lymphomas have been infrequently described in hamsters. This clinical report describes the clinical and histopathological aspects of a spontaneous lymphoma.

**Keywords:** Spontaneous lymphoma, golden hamster, histopathology





Since hamsters are increasingly being used as a popular pet animal worldwide, a good veterinary care of these animals is required; therefore, veterinarians need to know more up to date information to offer greater range of options for diagnosis and treatment. Hamsters are the best animal model for experimentally induced neoplasms; however, the incidence of spontaneous neoplasm in this animal is considered approximately 2-4% (Homburger 1983, Harkness and Wagner 1995). In golden hamsters, lymphoreticular neoplasms are enclosed in the second group in frequency, coming after the adrenal cortex endocrine cancers (Harkness and Wagner 1995). The most common sites for lymphomas are peripheral lymph nodes. The other organs which more often involved are the bowel, liver, kidney and spleen, although neoplasm infiltrates and white nodular masses can be found in several other body sites. The histological appearance is variable, some showing only immature lymphocytes and others more pleomorphic cells. Large cell lymphoma is the most common cell pattern, but histiocytic or plasma cell differentiated and lymphocytic neoplasms have also been described (Pour et al 1976, Vanhoosier-Junior and Trentin 1979). The frequency of lymphoid neoplasms and occurrence of horizontally transmitted cases have strengthened the hypothesis that they have an underlying viral etiology and may appear to over a year following exposure to an infectious agent as neonates (Mc Martin 1979, Coggin et al 1983, Strandberg 1987). *Hamster papilloma virus* (HaPV) seems to be the causative agent of this tumor. This virus belongs to the subgroup *Papovaviride* and also causes keratinizing skin tumors of hair follicle origin. The scanty necropsy reports of lymphoma occurring in hamsters are often cases of hematologic malignancies experimentally induced (Keebl and Meredith 2006) whereas; the present study describes the clinical and pathological findings of spontaneous lymphoma possibly due to the aging process.

A 1.5-year-old male golden hamster was referred to the veterinary hospital of Kerman University with a history of anorexia,



Figure 1. Generalized lymphadenomegaly (arrows) in the affected hamster

diarrhea, obvious swelling of cervical lymph nodes and progressive weight loss since two weeks ago. During physical examination generalized lymphadenomegaly and severe dehydration was seen (Figure 1). Initial therapy was symptomatic and consisted of intraperitoneal dextrose and hydrocortisone injection. Nevertheless, the patient died a few hours after the beginning of the treatment. In necropsy, significant enlargements of all superficial lymph nodes were observed but the mesenteric lymph nodes, spleen, and liver were seemed normal. Dissected masses showed necrotized center. Histopathologic examination revealed lymphoid cells containing large vesicular nuclei with evident nucleoli which showed a few mitotic figures (Figure 2). Regarding to the clinical and histopathologic findings, spontaneously occurring diffuse malignant non-Hodgkin B-cell lymphoma was confirmed.

Many age dependent diseases can occur in hamsters over the age of 18 months. Liver and kidney failure, fur loss, neoplastic diseases and dental problems are the most common geriatric conditions, which would eventually result in the death. According to Keebl and Meredith (2006), lymphomas are frequently occurring in lymphoid tissues in hamsters but they are most commonly observed in hematopoietic system in older animals. Despite reports revealing that lymphoma was arisen in the large and small intestine and even mesenteric lymph nodes, there is no evidence of above mentioned tumor in these regions in the present case. The neoplasm's most common site is on peripheral lymph nodes. In addition to intestine and mesenteric lymph node, other affected organs in approximate descending order of frequency include liver, kidneys, thymus, peripheral lymph nodes, stomach, eye and inguinal lymph nodes.

Cytological examination of cells from effusion or masses is a useful diagnostic procedure; nevertheless the histopathologic conclusion is often required. Laboratory abnormalities will vary according to the affected organs (Antinoff and Hahn 2004).

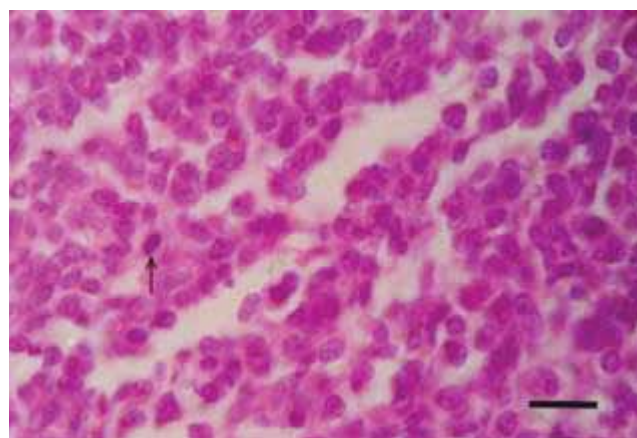


Figure 2. Lymphoid cells containing large vesicular nuclei with evident nucleoli which showed a few mitotic figures (arrow). H & E. Bar=25  $\mu$ m.



The histological appearance is variable, some showing only immature lymphocytes and others more pleomorphic cells. Large cell lymphoma is the most common cell pattern, but histiocytic or plasma cell differentiated and lymphocytic neoplasms have also been described (Strandberg 1987). Spontaneously occurring lymphoma has been transplantable, both by subcutaneous and intravenous route, with metastases preferentially in lungs, liver, spleen, kidney and pancreatic lymph nodes (Lt et al 1984). *Hamster papilloma virus* (HaPV) is known to be the main cause of malignant lymphoma in hamsters kept in laboratory environment. This type commonly arises in the intestine and mesenteric lymph nodes and could affect other organs. In one study, leukemia, lymphoma and osteogenic and anaplastic sarcoma develop in golden hamster inoculated intravenously at 3 weeks of age with simian virus 40, which is a papovavirus (Diamandopoulos 1972). In another study, DNA isolated from skin epitheliomas containing papovavirus induced lymphomas within four to eight weeks in 40 to 50% of new born golden hamster injected (Graffi et al 1969).

Lymphoma could be suspected in hamsters when clinical signs related to gastrointestinal system were seem to be concerned with several huge masses in abdominal region.

In summary, although the occurrence of geriatric problems are inevitable but as the interest of keeping exotic and laboratory animals like hamsters as companion pets has been growing, the accurate diagnosis of these diseases by veterinarians seems to be necessary and similar clinical reports could improve our knowledge in this field.

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### References

- Antinoff N, Hahn K, 2004. Ferret oncology: Diseases, diagnosis and therapeutics. *Vet Clin Exot Anim Pract*, 7, 549-625.
- Coggin JH, Bellomy BB, Thomas KV, Pollock WJ, 1983. B-cell and T-cell lymphomas and other associated diseases induced by an infectious DNA viroid-like agent in hamsters (*Mesocricetus auratus*). *Am J Pathol*, 110, 254-266.
- Diamandopoulos GT, 1972. Leukemia, lymphoma and osteosarcoma induced in the Syrian golden hamster by simian virus. *Science*, 176, 173-175.
- Graffi A, Bender E, Schramm T, Kuhn W, Schneiders F, 1969. Induction of transmissible lymphomas in Syrian hamsters by application of DNA from viral hamster papova virus-induced tumors and by cell-free filtrates from human tumors. *Proc Nat Acad Sci*, 64, 1172-1175.
- Harkness JE, Wagner JE, 1995. Neoplasia in the hamster, In: *The Biology and Medicine of Rabbits and Rodents*, Williams Rodents, Williams & Wilkins, Philadelphia, USA, pp; 254-255.
- Homburger F, 1983. Background data for tumor incidence in control animals (Syrian hamsters). *Prog Exp Tumor Res*, 26, 259-265
- Keebl E, Meredith A, 2006. Rodent biology and husbandry. In: *BSAVA manual of rodent and ferret, exotic pets*. British small animal veterinary association. Gloucester, UK, pp; 12.
- Lt H, Hesse B, Goertler K, 1984. A spontaneous trans plantable lymphosarcoma of the Syrian golden hamster (*Mesocricetus 11-auratus*): Experimental induction of metastases after subcutaneous and intravenous inoculation. *Exp Pathol*, 25, 57-63.
- Mc Martin DN, 1979. Morphologic lesions in aging Syrian hamsters. *J Gerontol*, 34, 502-511.
- Pour P, Mohr U, Althoff J, Cardesa A, Kmoch N, 1976. Spontaneous tumors and common diseases in two colonies of Syrian hamsters. IV. Vascular and lymphatic systems and lesions of other sites. *J Nat Cancer Inst*, 56, 963-974.
- Strandberg JD, 1987. Neoplastic diseases. In: Vanhoosier Junior GL, Mc Pherson CW, eds; *Laboratory Hamsters*. Academic Press, Orlando, USA, pp; 157-178.
- Vanhoosier-Junior GL, Trentin JJ, 1979. Naturally occurring tumors of the Syrian hamster. *Prog Exp Tumor Res*, 23, 1-12.

