OLGU SUNUMU CASE REPORT

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Cystic Endometrial Hyperplasia and Pyometra in a Golden Hamster (*Mesocricetus auratus*)

Bir Golden Hamsterda (*Mesocricetus auratus*) Kistik Endometriyal Hiperplazi ve Piyometra

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ABSTRACT A 1 years old, weighing approximately 90 g adult, intact golden hamster with uninterrupted bloody vaginal discharge was presented to department of obstetrics and gynecology clinic . Enlarged uterine horns were detected behind the kidneys during ultrasonography. Based on the history, clinical signs, and ultrasonographic findings; cystic endometrial hyperplasia and pyometra complex were diagnosed. Ovariohysterectomy was recommended for the animal. The stitches were removed on the 10th day in the post-operative period. The diagnosis was confirmed by histopathologically in the organ pieces submitted to pathology after the operation. In conclusion, since pyometra is a rare condition in hamsters and could not find any similar case report for this specie, it is suggested to present this case and ovariohisterectomy is recommended despite the high anesthesia risk in such cases.

Keywords: Endometrial hyperplasia; pyometra; uterus; bloody discharge

ÖZET Bir yaşında, yaklaşık 90 g ağırlığında, erişkin, kısırlaştırılmamış, kesintisiz kanlı vajinal akıntısı olan bir golden hamster, doğum ve jinekoloji kliniğine getirildi. Ultrasonografi sırasında böbreklerin arkasında genişlemiş uterus kornuları tespit edildi. Anamnez, klinik belirtiler ve ultrasonografik bulgulara dayanarak; kistik endometriyal hiperplazi ve piyometra kompleksi tanısı konuldu. Hayvan için ovariohisterektomi önerildi. Dikişler, ameliyat sonrası 10. günde alındı. Ameliyat sonrası patolojiye gönderilen organ parçalarında tanı histopatolojik olarak doğrulandı. Sonuç olarak piyometranın, hamsterlerde nadir görülen bir hastalık olması ve bu tür için benzer bir olgu sunumuna rastlanmaması nedeniyle bu olgunun sunulması düşünülmüş olup; bu gibi durumlarda yüksek anestezi riskine rağmen ovariohisterektomi önerilmektedir.

Anahtar Kelimeler: Endometriyal hiperplazi; piyometra; uterus; kanlı akıntı

Cystic endometrial hyperplasia (CEH) is considered the initial stage of pyometra.[1] Pyometra is a very common disease of unspayed dogs and cats with pus-filled uterus and a less frequent diagnosis in other small animal species.[2,3] The genital tract associated clinical signs and systemic disease can be present in dogs with pyometra. Pisu et al. reported pyometra in a golden hamster which was treated with an anti-progestagen compound (Alizine®, Virbac, Milano, Italy) other than ovariohysterectomy.[4] In ferrets, it is reported that CEH-pyometra complex occurs due to adrenal gland disease, ovarian remnant syndrome and ovarian cancer.[5] CEH-pyometra has been reported in rabbits, chinchillas, mice and guinea

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pigs.[6,7] Increased levels or imbalance of ovarian steroids lead to CEH-pyometra complex.[8] Progesterone activity leads to endometrial gland secretion, supression of the immune responses, reduction of myometrial activity, cervix closure, blocks the drainage of uterine fluids and causes a suitable environment for bacterial growth.[9] As pyometra is a life-treatining condition in all kind of species it should be treated and the most appropriate treatment option of this disease is ovariohysterectomy. Since pyometra is a rare condition in hamsters and could not find any similar case report for this specie, it is suggested to present this case.

CASE REPORT

Informed consent was obtained from the client for the hamster. A 1 years old, weighing approximately 90 g adult, intact golden hamster (*Mesocricetus auratus*) was presented to department of obstetrics and gynecology clinic. The animal was housed in a stainless steel cage and was fed with pellet feed and grass, ad libitum water. The golden hamster had bloody discharge from vagina for over 1 week (Figure 1A). The owner complained about the anorexia. Because the patient demonstrated vaginal bleeding, ultrasonography was performed on reproductive tract (Easote MyLab Five Vet, Milano, Italy). Enlarged uterine horns were detected behind the kidneys during ultrasonography, endometrium was measured as 3.6 mm in diameter (Figure 1B). CEH and pyometra complex were diagnosed according to the anemnesis, ultrasonography and clinical findings. Ovariohysterectomy was recommended for the animal. A small closed box was used to induced anaesthesia. Isoflurane (Forane inhalation solution®, AbbVie, Turkey) was given at a rate of 5% in 2 L/min oxygen flow. General anaesthesia was maintained with isofluorane 2.5% in and oxygen flow for the hamster (Figure 1C). Median line through linea alba was preferred for the surgery. The surgey was carried out very carefully, both of the ovaries and enlarged uterus were excised (Figure 1D).

They were removed according to the three clamp procedure successfully, the abdominal cavity was closed with interrupted stitch and the subcutaneous layer was closed with the same stitch technique, the skin was closed with non-absorbable material for stitch. The operation was completed in 30 minutes totally. Recovery from anesthesia was uneventful. Enrofloxacin (Baytril-K 5%®, Bayer, Turkey) was given at 10 mg/kg subcutaneously and then continued orally twice daily for a week.

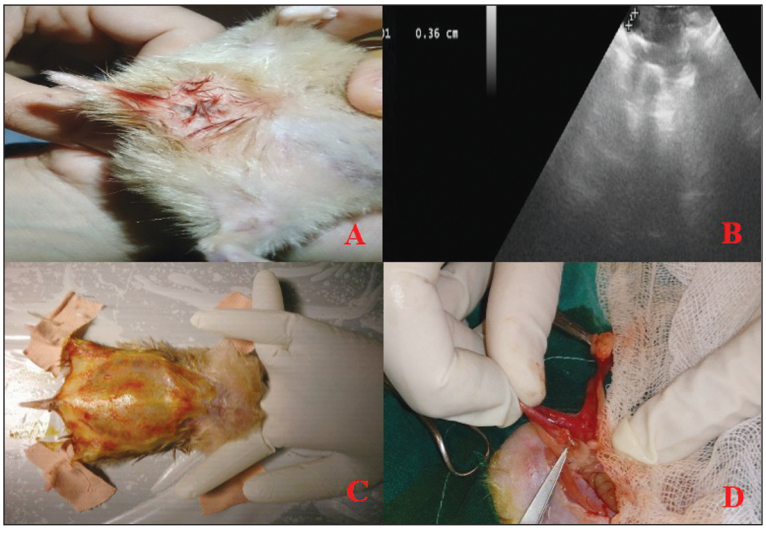

FIGURE 1: A) Bloody discharge from the vulva. **B)** The cystic endometrial hyperplasic area can be indicated by the arrow. **C)** Anesthesia induction and maintenance. **D)** Uterine body and the right ovary during surgery.

Meloxicam (Metacam®, Boehringer Ingelheim, İstanbul, Turkey) was continued orally every 24 hours for a week. The stitches were removed on the 10th day in the post-operative period (Figure 2). The organ pieces were submitted to pathology for histopathological examination after the operation. The tissue samples were fixed in 10% buffered formalin. Than the tissue samples were embedded in paraffin wax and sectioned at 2-3 µm. They were stained with hematoxylin and eosin for histopathology.

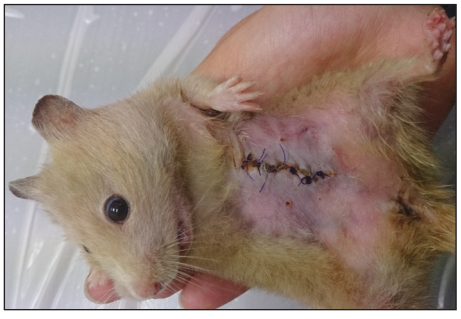

FIGURE 2: Golden hamster at the 10th day after the surgery.

In the microscopic examination, a large number of intact and caryorectic neutrophil leukocytes, macrophage-containing infiltrate (purulent infiltrate-pus) filled and dilated the uterine mucosa, there were locally dilatations and cystic changes in the uterine glands, in intact mucosal and glandular epithelial cells hyperplasic changes such as finger-like projections and some degenerative changes (vacuolation, etc.) were observed, in the lumens of the mucosal glands there were contents similar to the lumen of the organ. Inflammatory infiltrates rich in plasma and macrophages were observed in the interglandular mucosal tissue (Figure 3). CEH and pyometra were diagnosed histopathologically.

DISCUSSION

The CEH/pyometra complex is acute or chronic hyperplasia of the endometrium and infiltration of inflammatory cells that can be found in all layers of the uterus.[10] CEH do not always result in the development of pyometra because it can develop independently of these conditions. If bacteria

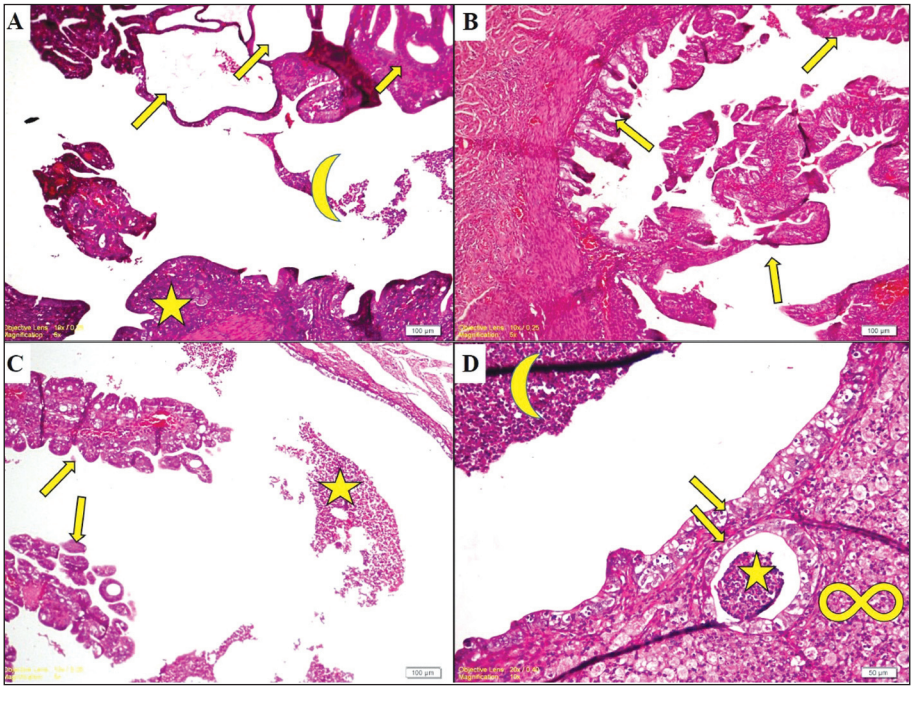

FIGURE 3: A) Dilatation in the organ lumen and purulent infiltrate (yellow crescent), cystic and dilatative changes in the uterine glands (yellow arrow) (100 µm). **B)** Hyperplastic changes, finger-like projections (yellow arrows) (H&E) (100 µm). **C)** Dilatation in the organ lumen and purulent infiltrate (yellow star), finger-like projections (yellow arrows) (H&E) (100 µm). **D)** Dilatation in the organ lumen and purulent infiltrate (yellow crescent), degenerative changes in the mucosal and glandular epithelium (yellow arrow), purulent infiltrate inside the glands (yellow star) and inflammatory infiltrate rich in macrophages and plasma cells (yellow infinity sign) (H&E) (50 µm).

established than pyometra is developed.[11] The best and definitive treatment option of pyometra in all kind of specie is ovariohysterectomy. However, some clients do not prefer surgery because of a high anesthesia risk. There is a case report which treated pyometra with aglepristone in a golden hamster. Long term follow up of that animal exhibited the estrous behavior regularly but as the client did not want the hamster mate, there is no available data about the further fertility of the animal.[4] According to the client decision ovariohysterectomy was applied to the hamster in this case. The blood sample collection is very difficult in pet hamsters so routine haematology is not recommended.[12] We did not perform any hematology testing in this case too.

Pisu et al. reported the thickened endometrium in a golden hamster with pyometra, the endometrium was measured as 3.6 mm in diamater in this case which is a very close value with their finding in the same specie.[4]

Female hamsters cycle at a 4-day period and a copious postovulation vaginal discharge (day 2 of the oestrus cycle) can be seen. It is creamy white and it has got a very strong odor. It is a usual status and not to be believed abnormal.[13] Uterine pathology should be suspected in the presence of uninterrupted vaginal discharge. However, in such cases, it is useful to diagnose the disease by ultrasonography. In pathological vaginal discharge, neutrophils and red blood cells can be distinguished than the normal oestrus discharge.[14] Since the bloody vaginal discharge continued uninterruptedly in this hamster, no examination was performed by taking samples from the vaginal discharge. In a case report, a 6-month-old hamster that developed pyomtra was treated with a progesterone receptor blocker aglepristone, and it was stated that the animal was recovered. However, after long-term patient follow-up, it was stated that the general condition of the animal was good and there was no definite information about its fertility due to the patient's failure to mate the hamster, and how long the long-term patient follow-up lasted was not mentioned in that cased report too.[4] However, when the previous studies on the treatment of pyometra in dogs with aglepristone were examined, it was stated that the probability of recurrence of pyometra after aglepristone was high, especially in dogs older than 5 years of age. Ovariohysterectomy has been recommended for such dogs.[15] There can be a possibility of recurrence in hamsters after treatment of pyometra with aglepristone even, and there is no study about this in hamsters. Therefore, in such cases, it is beneficial to prefer ovariohysterectomy despite the risk of anesthesia. In conclusion, even if there is a creamy discharge from the vagina during estrous cycle in hamsters, bloody discharge should suggest pyometra. Since pyometra is a rare condition in hamsters and could not find any similar case report for this specie, it is suggested to present this case and ovariohisterectomy is recommended despite the high anesthesia risk in such cases.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

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REFERENCES

1. Barrau MD, Abel JH Jr, Verhage HG, Tietz WJ Jr. Development of the endometrium during the estrous cycle in the bitch. Am J Anat. 1975;142(1):47-65. [Crossref] [PubMed]
2. Egenvall A, Hagman R, Bonnett BN, Hedhammar A, Olson P, Lagerstedt AS. Breed risk of pyometra in insured dogs in Sweden. J Vet Intern Med. 2001;15(6):530-8. [Crossref] [PubMed]
3. Hagman R, Ström Holst B, Möller L, Egenvall A. Incidence of pyometra in Swedish insured cats. Theriogenology. 2014;82(1):114-20. [Crossref] [PubMed]
4. Pisu MC, Andolfatto A, Veronesi MC. Pyometra in a six-month-old nulliparous golden hamster (Mesocricetus auratus) treated with aglepristone. Vet Q. 2012;32(3-4):179-81. [Crossref] [PubMed]
5. Fisher PG. Stump pymetra in a female ferret. Exotic Pet Pract. 1996;1:7.
6. Granson HJ, Carr AP, Parker D, Davies JL. Cystic endometrial hyperplasia and chronic endometritis in a chinchilla. J Am Vet Med Assoc. 2011;239(2):233-6. [Crossref] [PubMed]
7. Nasrin A, Baharak A, Reza K. Concurrent cystic endometrial hyperplasia, ovarian luteoma and biliary cyst adenoma in an aged rabbit (Oryctolagus cuniculus): case report and literature review. Asian Pac J Trop Biomed. 2012;2(3):1975-8. [Crossref]
8. De Bosschere H, Ducatelle R, Tshamala M. Is mechanically induced cystic endometrial hyperplasia (CEH) a suitable model for study of spontaneously occurring CEH in the uterus of the bitch? Reprod Domest Anim. 2002;37(3): 152-7. [Crossref] [PubMed]
9. Chaffaux S, Thibier M. Peripheral plasma concentrations of progesterone in the bitch with pyometra. Ann Rech Vet. 1978;9(3):587-92. [PubMed]
10. Dow C. The cystic hyperplasia-pyometra complex in the bitch. Vet Rec. 1957;69:1409-15. [Link]
11. Varga M, Morris T. Laboratory and pet rodents, and lagomorphs. In: Noakes DE, Parkinson TJ, England GCW, eds. Veterinary Reproduction and Obstetrics. 10th ed. United Kingdom: Elsevier; 2019. p.701-2. [Crossref]
12. Capello V. What every veterinarian needs to know about hamsters. EXOTIC DVM 2.5. 2000. p.38-41. [Crossref]
13. Donnelly TM. Disease problems of small rodents. In: Quesenberry KE, Carpenter JW, eds. Ferrets, Rabbits and Rodents: Clinical Medicine and Surgery. 2nd ed. St. Louis: Saunders; 2004. [Crossref] [PMC]
14. Capello V. Pet hamsters: selected anatomy and physiology. EXOTIC DVM 3.2. 2001. p.23-7. [Link]
15. Ros L, Holst BS, Hagman R. A retrospective study of bitches with pyometra, medically treated with aglepristone. Theriogenology. 2014;82(9):1281-6. [Crossref] [PubMed]