



RESEARCH ARTICLE

Retrospective evaluation of canine neoplasms in Konya region between 2006 and 2010

Semih Altan¹, Fahrettin Alkan², Yılmaz Koç², Özgür Özdemir³, Orhan Yavuz³

¹Dicle Üniversitesi Veteriner Fakültesi, Cerrahi Anabilim Dalı, Diyarbakır, ²Selçuk Üniversitesi Veteriner Fakültesi, Cerrahi Anabilim Dalı,

³Selçuk Üniversitesi Veteriner Fakültesi, Patoloji Anabilim Dalı, Konya, Türkiye

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*semih.altan@dicle.edu.tr

Özet

Altan S, Alkan F, Koç Y, Özdemir Ö, Yavuz O. Konya ve yöresinde köpeklerde 2006-2010 yılları arasında rastlanılan tümörlerin retrospektif değerlendirilmesi. **Eurasian J Vet Sci, 2013, 4, 185-191**

Amaç: Bu çalışmada 2006-2010 yılları arasında üniversite hayvan hastanesine getirilen 58 köpekte klinik, radyolojik, operatif ve histopatolojik muayeneleri neticesinde teşhis edilen neoplazma vakalarının geriye dönük değerlendirilmesi yapıldı.

Gereç ve Yöntem: Tümöral vakalar köpeklerin ırk, yaş ve cinsiyetine, tümörlerin özellikleri ve yerleşim yerleriyle birlikte tedavi şekillerine göre değerlendirildi.

Bulgular: Tümörlerin %48.3'üne cerrahi uygulama, %20.7'sine kemoterapi, %5.2'sine hem cerrahi hem kemoterapi ve %13.8'ine ise levamisol ve/veya otovaksinasyon uygulandı. Köpeklerin %12'sine ise ötenazi uygulandı. Kemoterapi, transmissible venereal tümör vakalarında yapılırken, papilloma vakalarında levamisol ve otovaksinasyon yapıldı. Tümörlerin %53.4'ü benign karakterde iken %46.6'sı malign karakter gösterdiği belirlendi.

Öneri: Bu değerlendirme ile Konya ve yöresindeki köpeklerde gözlenen tümöral vakalar ve bunların tedavi sonuçları ortaya konmuştur. Ayrıca, venereal tümörler kemoterapi uygulamasıyla (vinkristin), papillomalar ise levamisol ve otovaksinasyon işlemiyle tedavi edilebilir.

Anahtar kelimeler: Köpek, retrospektif değerlendirme, neoplazma, kemoterapi, cerrahi.

Abstract

Altan S, Alkan F, Koc Y, Ozdemir O, Yavuz O. Retrospective evaluation of canine neoplasms in Konya region between 2006 and 2010. **Eurasian J Vet Sci, 2013, 4, 185-191**

Aim: It was conducted that a retrospective evaluation of cases diagnosed as neoplasms according to operative, clinical, histopathological and radiological examinations in 58 dogs that were examined at University Animal Hospital between 2006 and 2010.

Materials and Methods: The tumoral cases had been evaluated according to race, gender, age of dogs, characteristics and location of the neoplasms, and applications of treatment.

Results: Surgical treatment was applied in 48.3% of the cases, chemotherapy was applied in 20.7%, both surgical treatment and chemotherapy were applied in 5.2% of cases, and levamisole and/or autovaccination were applied 13.8% of cases. Euthanasia was applied in 12% of cases. Chemotherapy was used primarily on transmissible venereal tumors, and papillomatosis cases were treated with levamisole and autovaccination. Among the diagnosed neoplasms, 53.4% were benign and 46.6% were malignant.

Conclusions: This retrospective evaluation revealed differences in the treatment methods and results of dog neoplasia in Konya region. Moreover, venereal tumors could be treated with chemotherapy (vincristine), while papillomas could be treated with levamisole and/or autovaccination.

Keywords: Canine, retrospective evaluation, neoplasia, chemotherapy, surgery



Introduction

Neoplasms are described as abnormal cellular growths with constant, irregular, and faster growth attributes that distinguish them from normal tissue. Although any tissue can develop into a neoplasm via the effects of various agents (viruses, mutagenic compounds, radiation etc), the general attribute of all neoplasms is a genomic defect in the cells. Neoplasms are classified according to host breed, age and gender as well as tissue, organ and system of origin. Benign and malignant are defined according to growth and attributes of a neoplasm. The incidence of neoplasms in dogs is highest in the mammary gland, followed by the cutaneous, urogenital, and head-neck regions, respectively (Morris and Dobson 2001, Cullen et al 2002, Vural et al 2007).

The treatment and prognosis of a patient with a neoplasm are strictly linked to the nature of the neoplasm. Thus, it is imperative to understand the histological structure, dimensions and anatomical location of neoplasms. Surgery, radiotherapy and chemotherapy are the three methods used to treat human neoplasms. The most effective treatment method for solid neoplasms in animals is surgery (Morris and Dobson 2001).

Numerous studies have evaluated neoplasms in dogs in Turkey according to host breed, gender, age, location and characteristics (Pamukçu and Ertürk 1962, Ertürk et al 1971, Erer and Kiran 1993, Sönmez and Özmen, 1996, Gülçubuk and Gürel 2003).

We evaluated cases with a neoplasm diagnosis according to clinical, radiological, histopathological and operational diagnoses in dogs treated at the University Animal Hospital between 2006 and 2010.

Materials and Methods

We retrospectively evaluated cases with a diagnosis of a neoplasm in various tissues among 58 dogs of various ages and breeds that presented at the University Animal Hospital between 2006 and 2010 according to the clinical, radiological, histopathological and operational diagnoses. The cases were treated with surgery, surgery accompanying chemotherapy, adjuvant therapy (levamisole) and autovaccination or euthanasia with consent of the owners, according to the histopathological diagnosis (Table 2).

Chemotherapy was the most applied to transmissible venereal tumor (TVT). For the chemotherapy, vincristine sulfate (Vincristine 1 mg/mL, Orna İlaç, İstanbul, Turkey) was used to treat TVT cases at 0.025 mg/kg IV (0.5-0.7 mg/m²) per day a week (for 3-5 weeks). Papillomatosis cases were treated with levamisole and/or autovaccination. Levamisole

was used at 3 mg/kg SC (Actipar, Alke ilaç, İstanbul, Turkey), together with/without autogenic vaccination. The treatment applications were presented in Table 2.

Results

The locations and origins of the neoplasms from the dogs are presented in Table 1. Surgery was applied to 28 of the 58 (48.3%) canines with a neoplasm diagnosis, whereas chemotherapy (Vincristine) was performed in 20.7% of cases. Surgery with chemotherapy in 5.2% of cases and levamisole and/or autovaccination in 13.8% of cases were performed. Approximately 12% of cases were euthanized at the request of the owner of the animal.

Among the diagnosed neoplasms, 53.4% were benign (Figure 1D) and 46.6% were malignant (Figs. 1A-C). Of the benign neoplasms, 52% were TVT, 32% were papillomas, and 16% were other benign neoplasms (seminoma, benign dermal melanoma, fibrolipoma, hepatoid gland adenoma and fibroadnexal hamarthoma) (Figures 1 and 2). Of the malignant neoplasms, 37% were sarcomas, 30% were carcinomas, 11% were malignant melanomas, 8% were malignant mixed neoplasms, (Figure 2) and 15% were other malignant neoplasms (malignant TVT, trichoblastoma, adamantinoma and malignant schwannoma).

Of the 58 dogs with a neoplasm, the ages of 12 could not be determined. The mean age of the remaining 46 canines was 6.1±4.1 years, whereas 11% were <1 year old, 52% were 1-5 years, 17% were 6-10 years and 20% were >10 years.

The locations of the neoplasms were genital-perineal-inguinal (36%), head and neck region (33%), extremities (15.5%) and abdominal-thoracic region (15.5%). Of the neoplasms, 67.2% were epithelial, 20.7% were mesenchymal, 6.9% were melanocyte neoplasms, 3.5% were mixed neoplasms, and 1.7% were odontological neoplasms (Table 1).

Of the 58 dogs with a neoplasm diagnosis, 38% were a cross-breed, 17% were Terriers, 17% were Turkish Shepherds, 10% were German Shepherds, 5% were Pointers and Huskies, 4% were Rottweiler, and 2% were Boxers and Cocker Spaniels. Among the dogs with a neoplasm diagnosis, 21 were female and 37 were male (Table 2).

Discussion

The ages of 12 of the 58 subject dogs could not be determined. This was possibly due to the inclusion of unrecorded dogs belongs to at the Konya Society of Protection of Nature and Animals.

The incidence of neoplasms among dogs ages 6-10 years is





Table 1. Localization, origin and type of the neoplasms.

Origin and type of the tumors	Genital-Perineal- Inguinal	Head-Neck	Extremities	Abdomen- Thorax	Total
Epithelial tumors					
Complex carcinoma				1	1
Trichoblastoma (ribbon-like type)		1			1
Bazosquamous cell carcinoma		1			1
Well differentiated papillary adenocarcinoma	1				1
Papillary adenocarcinoma		1			1
Adenocarcinoma	1				1
Sebaceous adenocarcinoma		1			1
Squamous cell carcinoma		1			1
Well differentiated sebaceous carcinoma				1	1
Malign TVT	1				1
TVT	14	1		1	16
Hepatoid gland adenoma	1				1
Fibroadnexal hamarthoma	1				1
Seminoma	1				1
Papilloma		9	1		10
Total	20	15	1	3	39 (67.2%)
Mezenchymal tumors					
Fibromixosarcoma				1	1
Mixosarcoma				1	1
Fibrosarcoma			1		1
Osteosarcoma			7		7
Fibrolipoma				1	1
Malign Schwanoma	1				1
Total	1		8	3	12 (20.7%)
Mixed tumors					
Malign mixed tumor (Carcinosarcoma)				1	1
Malign mixed tumor				1	1
Total				2	2 (3.5%)
Melanocytic tumors					
Benign dermal melanoma		1			1
Malign melanoma (Epitheloid type)		1			1
Malign melanoma (Mixed type)		1		1	2
Total		3		1	4 (6.9%)
Odontogenic tumors					
Adamantinoma		1			1
Total		1			1 (1.7%)
Sum of total	21 (36%)	19 (33%)	9 (15.5%)	9 (15.5%)	58 (100%)





Table 2. Treatment applications and clinical outcome of the tumoral dogs.

No	Race	Gender	Age	Histopathological characteristic	Treatment	Clinical outcome
1	Crossbreed	F	11 y	Fibromixosarcoma	Total extirpation	Bad
2	Turkish Shepherd	M	4 y	TVT	Total extirpation-chemotherapy	Good
3	German Shepherd	M	4 y	Benign dermal melanoma	Total extirpation	Good
4	Terrier	F	8 y	Complex carcinoma	Total extirpation	Bad
5	Crossbreed	F	U	Trichoblastoma (ribbon-like type)	Total extirpation	Bad
6	Crossbreed	M	2 y	Papilloma	Total extirpation	Good
7	Terrier	F	10 y	Fibrolipoma	Total extirpation	Bad
8	Turkish Shepherd	M	6 y	TVT	Chemotherapy (Vincristine)	Good
9	Crossbreed	M	4 y	Bazosquamous cell carcinoma	Total extirpation	Bad
10	Turkish Shepherd	M	1 y	Osteosarcoma	Total extirpation	Bad
11	Husky	M	7 m	Papilloma	Levamisole and autovaccination	Good
12	Crossbreed	M	8 y	TVT	Chemotherapy (Vincristine)	Good
13	Crossbreed	M	8 m	Papilloma	Levamisole	Good
14	German Shepherd	M	2 y	TVT	Chemotherapy (Vincristine)	Good
15	German Shepherd	M	12 y	Seminoma	Orchidectomie	Good
16	Turkish Shepherd	F	3 y	Osteosarcoma	Euthanasia	Bad
17	Crossbreed	M	5 y	TVT	Chemotherapy (Vincristine)	Good
18	Rottweiler	M	4,5 y	Osteosarcoma	Euthanasia	Bad
19	Crossbreed	M	3 y	TVT	Chemotherapy (Vincristine)	Good
20	Terrier	F	15 y	Well differentiated papillary adenocarcinoma	Total extirpation	Bad
21	Pointer	M	2 y	Papillary adenocarcinoma	Total extirpation	Bad
22	Crossbreed	F	U	Mixosarcoma	Euthanasia	Bad
23	Crossbreed	M	4 y	TVT	Chemotherapy (Vincristine)	Good
24	Crossbreed	F	5 y	Adenocarcinoma	Total extirpation	Bad
25	German Shepherd	M	U	Sebaceous adenocarcinoma	Total extirpation	Bad
26	Terrier	M	U	Papilloma	Autovaccination	Good
27	Pointer	M	U	Osteosarcoma	Euthanasia	Bad
28	Crossbreed	M	5 y	Squamous cell carcinoma	Biopsy-Euthanasia	Bad
29	Terrier	F	13 y	Malign melanoma (Epitheloid type)	Total extirpation	Bad
30	Turkish Shepherd	F	7 y	Malign melanoma (Mixed type)	Euthanasia	Bad
31	Turkish Shepherd	F	8 y	Malign melanoma (Mixed type)	Total extirpation	Bad
32	Crossbreed	F	U	Fibrosarcoma	Total extirpation	Bad
33	Crossbreed	M	8 y	TVT	Total extirpation	Good
34	Pointer	F	9 y	Papilloma	Total extirpation	Good
35	Turkish Shepherd	M	6 y	TVT	Chemotherapy (Vincristine)	Good
36	Husky	M	2 y	TVT	Chemotherapy (Vincristine)	Good
37	Terrier	F	6 y	Malign Schwanoma	Total extirpation	Bad
38	Husky	M	2 y	Malign TVT	Total extirpation and Chemotherapy	Bad
39	Turkish Shepherd	M	11 m	Papilloma	Levamisole	Good
40	Turkish Shepherd	M	4 y	TVT	Chemotherapy (Vincristine)	Good
41	Crossbreed	M	3 y	TVT	Total extirpation	Good
42	Crossbreed	F	13 y	TVT	Total extirpation	Good
43	Crossbreed	F	U	Hepatoid gland adenoma	Total extirpation	Good
44	Terrier	F	13 y	Malign mixed tumor	Total extirpation -Chemotherapy-Euthanasia	Bad
45	Turkish Shepherd	M	2 y	TVT	Chemotherapy (Vincristine)	Good
46	Crossbreed	M	3 y	TVT	Chemotherapy (Vincristine)	Good
47	Terrier	F	U	Papilloma	Levamisole	Good
48	Boxer	M	U	Papilloma	Levamisole	Good
49	Turkish Shepherd	M	15 y	Osteosarcoma	Euthanasia	Bad
50	Turkish Shepherd	M	1 y	Papilloma	Levamisole and autovaccination	Good
51	Crossbreed	M	4 y	Fibroadnexal hamarthoma	Total extirpation	Good
52	Rottweiler	F	6 y	Osteosarcoma	Euthanasia	Bad
53	Crossbreed	M	U	Papilloma	Autovaccination	Good
54	Crossbreed	M	U	Osteosarcoma	Biopsy+Euthanasia	Bad
55	Spaniel Cocker	M	10 y	Adamantinoma	Total extirpation	Bad
56	Terrier	F	11 y	Well differentiated sebaceous carcinoma	Total extirpation	Bad
57	Crossbreed	M	U	TVT	Chemotherapy (Vincristine)	Good
58	Terrier	F	12 y	Malign mixed tumor (Carcinosarcoma)	Total extirpation	Bad

U: Unknown, M: Male, F: Female, y: year, m: month.





increasing (Cotchin 1954, Erer and Kiran 1993, Gülçubuk and Gürel 2003). However, we identified few neoplasms in dogs of this age (Table 2). Approximately 52% of benign neoplasms in this study were TVT, which occurs only in dogs at 2–5 years of age (Purohit 2009). In 13 of the 17 TVT cases, the dogs were <6 years old, which supports our view. Furthermore, the incidence of neoplasm was higher in dogs of ages 1–5 years and >10 years. In another study (Erer and Kiran 1993), 48.1% of 34 dogs with a neoplasm diagnosis were ages 6–10, compared to 20% in our study. Similarly, in another study (Gülçubuk and Gürel 2003), the incidence of neoplasm was 4% in dogs of age <1 year and 52% among dogs of age 6–10 years. However, in the present study, the neoplasm incidence was 11% among dogs of age <1 year and 17% among dogs of age 2–6 years. We found malignant neoplasms generally in dogs >10 years of age, whereas benign neoplasms were seen at any age (Table 2). According to this retrospective evaluation, age is thus not the sole indicator of the incidence of neoplasm among dogs. According to the study conducted by Erer and Kiran (1993) in Konya region, TVT cases found as 14.7%, whereas in our study, TVT cases found 29.3%. The other data presented was similar to Erer and Kiran (1993).

The incidence of malignant neoplasms in previous studies is higher than that of benign neoplasms (Mialot and Lagadic 1990, Eren and Kiran 1993, Sönmez and Özmen 1996, Gülçubuk and Gürel 2003), but here only 46.6% of neoplasms were malignant, which was possibly due to the high-quality care and environmental conditions in which the dogs were kept (Table 1). In this study, the incidence of neoplasm was higher among Turkish Shepherds and Terriers out of cross-breeds (Table 2). This is possibly due to the national breeding status and popularity of Turkish Shepherds in Turkey.

Terriers and Turkish Shepherds were the most susceptible to neoplasms, and the number of malignant neoplasm cases among Terriers was higher ($n=7$) when compared to Turkish Shepherds, whereas benign neoplasms were higher in number among Turkish Shepherds ($n=6$). The average age of Turkish Shepherd (5 ± 4.1 years) is shorter than that of Terrier (11 ± 2.9 years). Over the age of 10 is the period during which malignant neoplasms occur most commonly (Morris and Dobson 2001, Cullen et al 2002). Indeed, the susceptibility of Terriers were more susceptible to mammary and cutaneous neoplasms (Muller et al 2000, Gülçubuk and Gürel 2003). Owing to five of the seven malignant neoplasms cases which were mammary, it is supporting above mentioned reports (Table 2). The most common neoplasm in Turkish Shepherds was TVT. This was most likely due to the outdoor living environment of the Turkish Shepherd, which can lead to uncontrolled sexual behavior and the spread of disease.

Osteosarcoma is most common in larger breeds (Erer et al 1998, Cullen et al 2002). In this study, osteosarcomas were

identified in three Turkish Shepherds, two Rottweiler (Fig. 1A and 2A), a Pointer, and a crossbreed, which supports previous reports (Table 2).

Some reports suggest that females are more susceptible to neoplasms than males (Mialot and Lagadic 1990, Sönmez and Özmen 1996, Gülçubuk and Gürel 2003), whereas others (Cotchin 1954, Cotchin 1959, Erer and Kiran 1993) refute any such association. In our study, 36% of diagnosed neoplasm cases were in females and 64% were in males. However, subjects were evaluated at the surgery clinic; thus female genital system neoplasms (TVT, mamma, etc.), which are addressed by the Department of Obstetrics and Gynecology, were not evaluated. This could lead to inaccurate conclusions regarding the incidence of neoplasms in females. Most cases of female genital neoplasms involve the mammary gland (Cotchin 1954, Cotchin 1959, Köküslu and Akkayan 1972, Erer and Kiran 1993, Gülçubuk and Gürel 2003). In this study, the most common neoplasms among females were mammary neoplasms (48%), which support previous reports (Fig. 1B).

TVT that is mainly located genital region was often observed among males (Morris and Dobson 2001, Cullen et al 2002). A previous study (Sönmez and Özmen 1996) of 89 canines found TVT cases in 31 (35%) dogs; 15 females and 16 males. In this study, 17 TVT cases were found in the 58 cases (29.3%), which comprised 1 female and 16 male. While the incidence rates were higher, and in agreement with previous reports (Sönmez and Özmen 1996), the actual incidence of TVT among females could not be determined as the dogs were lost to follow-up at the Department of Obstetrics and Gynecology.

Oral papillomatosis is a common disease of puppies (Koç et al 2001). Oropharyngeal neoplasms were found to comprise 21% of papillomas in a study (Vural et al 2007). However, in this study, approximately 53% of head–neck region neoplasms were papillomas. Furthermore, the high frequency of papillomas in dogs <1 year of age supports the opinions of Vural et al (2007).

Surgery, radiotherapy, and surgery accompanying chemotherapy are the three main treatment methods for neoplasms. The most effective treatment method for solid neoplasms among animals is thought to be surgery (Morris and Dobson 2001). In this study, approximately half of the cases underwent surgery, 20.7% chemotherapy, and 5.2% both surgery and chemotherapy.

Conclusions

In conclusion, the number of cases of neoplasms is increasing due to the increase in the Konya region pet population. Neoplasms such as TVT and papilloma are generally treated successfully, whereas malignant neoplasms are not treated

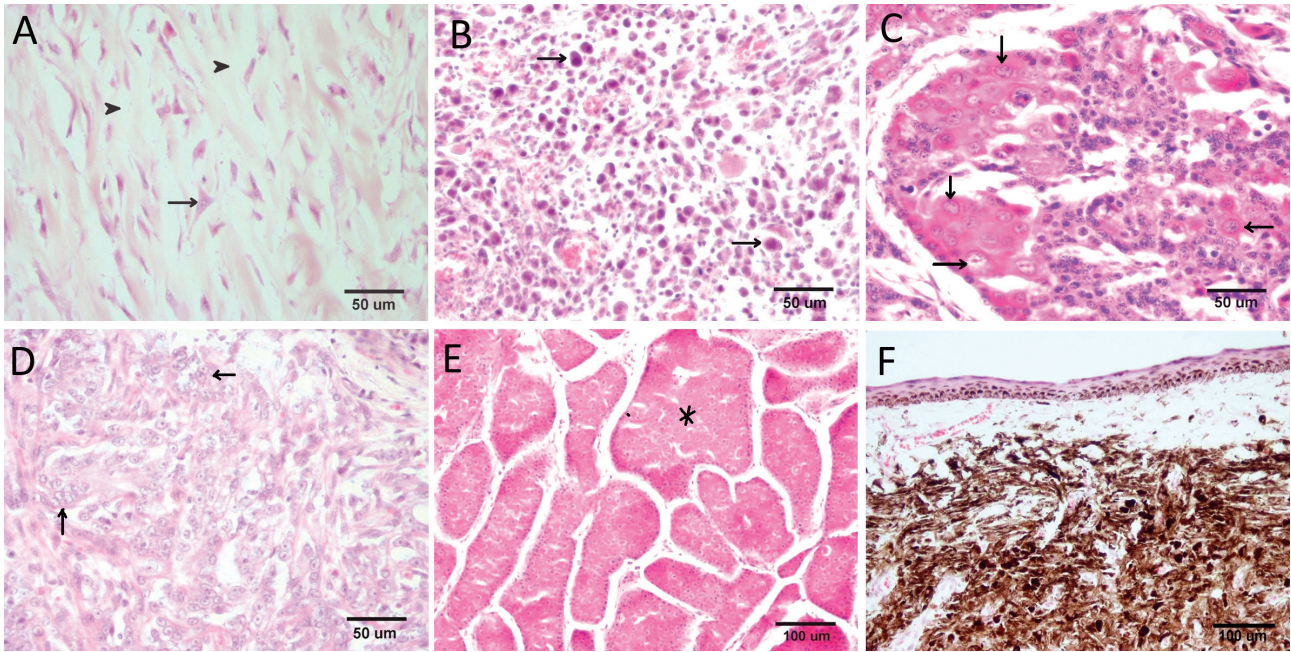


Figure 2. Histopathological samples of various tumor tissues. (A) Osteosarcoma. Atypical osteoblast (arrow) and osteoid tissues (arrow head), (B) Malign melanoma (Mixed type). Malignant cells containing melanin (arrow), (C) Sebaceous adenocarcinoma. Atypical epithelial cells (arrows), (D) Papillary adenocarcinoma. Atypical epithelial cells (arrows), (E) Hepatoid gland adenoma. Benign epithelial cells and glandular formations (asterisk), (F). Benign dermal melanoma. Dermal cells containing melanin. H&E.

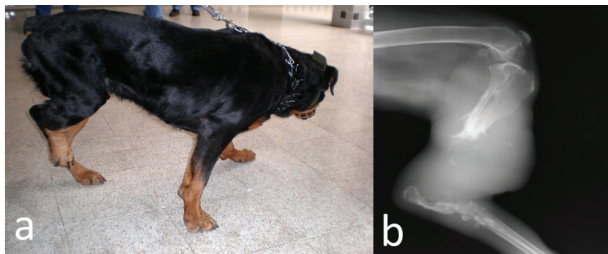


Fig. 1.A. Clinical (a) and radiological (b) view of the osteosarcoma in the right tibia in a Rottweiler, male, 4,5 years old.

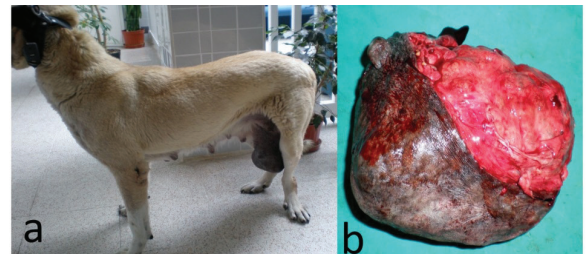


Fig. 1.B. Clinical view (a) and removed mass (b) of malign melanoma (mixed type) in mammary gland in a Turkish shepherd, female, 8 years old.



Fig. 1.C. Clinical view of sebaceous adenocarcinoma on cheek in a German shepherd, male, unknown age.

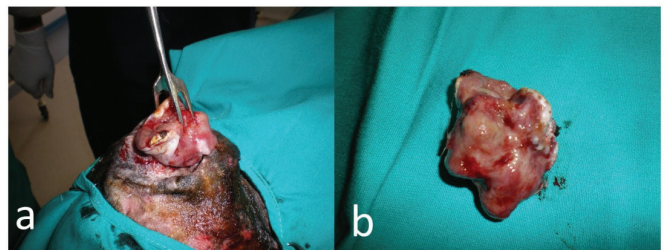


Fig.1.D. Clinical view (a) and removed mass (b) of benign dermal melanoma in auricle in a German shepherd, male, 4 years old.

Figure 1. Some views belong to animals with tumors.





appropriately. The majority of neoplasms occurred in Turkish Shepherds and Terriers, and the majority of malignant cases were in Terriers.

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