VETERİNER HEKİMLER DERNEĞİ DERGİSİ
JOURNAL OF THE TURKISH VETERINARY MEDICAL SOCIETY
ISSN: 0377-6395
e-ISSN: 2651-4214
Dergi ana sayfası /*Journal homepage:* http://dergipark.org.tr/vetheder
OPEN ACCESS

10.33188/vetheder.1455874

Araştırma Makalesi / Research Article

Retrospective evaluation of diseases in wild birds brought to Aksaray University VeterinaryFaculty Animal Hospital Surgery Clinics: 102 cases (2020-2023)

Fehmiye GÜMÜŞ [1,a*], Nihan AVCI [1,b], Deva Başak BOZTOK ÖZGERMEN [1,c], Mehmet SAĞLAM [2,d]

[1] Aksaray Üniversitesi, Faculty of Veterinary Medicine, Department of Surgery,Aksaray,Türkiye
[2] Siirt Üniversitesi, , Faculty of Veterinary Medicine, Department of Surgery,Siirt,Türkiye

0000-0003-1670-0709[a]; 0000-0001-6789-8474[b]; 0000-0001-7039-8956[c]; 0000-0001-8934-8529[d]

MAKALE BİLGİSİ / ARTICLE INFORMATION:

Geliş / Received:
20 Mart 24
20 March 24

Revizyon/Revised:
05 Haziran 24
05 June 24

Kabul / Accepted:
07 Haziran 24
07 June 24

Anahtar Sözcükler
Kırık
Yumuşak doku
zedelenmesi
Tedavi
Vahşi kuşlar
Yara

Keywords:
Fracture
Soft tissue injuries
Treatment
Wild birds
Wound

ABSTRACT

This retrospective study aimed to evaluate surgical diseases in wild birds that were brought to Aksaray University Veterinary Faculty Animal Hospital. A total of 102 wild birds with orthopedic and/or soft tissue diseases were included in the study. The orthopedic diseases encountered were arthrosis (n=3), luxation (n=5), and fracture (n=38). The most frequent type of fracture was ulna fractures (33.33%), followed by radius fractures (27.45%), metacarpus fractures (9,80%), humerus fractures (9,80%), tibiotarsus fractures (9,80%), carpus (5,88%), and finally femur fractures (3.92%). The fractures were treated using an '8'-shaped bandage (n=15), intramedullary pin and cerclage application (n=12), and external fixator (n=1). In cases of infection, nerve damage, joint arthrosis, bone necrosis, and muscle macerations, wing amputation (n=10) was performed. The most prevalent soft tissue diseases were wounds and injuries (n=45), followed by general condition disorders (n=15), ophthalmological diseases (n=6), and neurological diseases (n=5) respectively. Wounds were treated with sutures or wound dressings. Infectious ophthalmologic diseases and neurological diseases were medically treated. All wild birds that are brought to a veterinary clinic should undergo a detailed physical and radiological examination for an accurate diagnosis. In cases where emergency intervention is required, it is crucial to perform the indicated treatment without delay and to maintain follow-up care. This will ensure that the birds can be safely returned to their natural habitats.

Aksaray Üniversitesi Veteriner Fakültesi Hayvan Hastanesi Cerrahi Anabilim Dalına getirilen yabani kuşların retrospektif değerlendirilmesi:102 Olgu (2020-2023)

ÖZET

Bu retrospektif çalışmada Aksaray Üniversitesi Veteriner Fakültesi Hayvan Hastanesi'ne getirilen yabani kanatlılarda cerrahi hastalıkların değerlendirilmesi amaçlandı. Çalışmaya ortopedik ve/veya yumuşak doku hastalığı olan toplam 102 yabani kuş dahil edildi. En sık görülen kırık tipi ulna kırıklarıydı (%33,33), bunu takiben radius kırıkları (%27,45), metakarpus kırıkları (%9,80), humerus kırıkları (%9,80), tibiotarsus kırıkları (%9,80), carpus (%5,88) ve son olarak femur kırıkları (%3,92) izledi. Kırıklar "8" şeklinde bandaj (n=15), intramedullar pin ve serklaj olgusu (n=12) ve eksternal fiksatör (n=1) kullanılarak tedavi edildi. Enfeksiyon, sinir hasarı, eklem artrozu, kemik nekrozu, ve kas maserasyonları durumlarında kanat amputasyonu (n=10) uygulandı. En sık görülen yumuşak doku hastalıkları yara ve yaralanmalar (n=45) olup, bunu sırasıyla genel durum bozuklukları (n=15), göz hastalıkları (n=6) ve nörolojik hastalıklar (n=5)takip etmiştir. Yaralar dikiş veya yara pansumanıyla tedavi edilmiştir. Enfeksiyöz oftalmolojik hastalıklar ve nörolojik hastalıklar medikal olarak tedavi edildi. Bir veteriner kliniğine getirilen tüm yabani kuşlar, doğru teşhis için ayrıntılı bir fiziksel ve radyolojik muayeneden geçirilmelidir. Acil müdahalenin gerekli olduğu durumlarda, belirtilen tedavinin gecikmeden uygulanması ve takip bakımının sürdürülmesi çok önemlidir. Bu, kuşların doğal yaşam alanlarına güvenli bir şekilde geri dönebilmelerini sağlayacaktır

How to cite this article: Gümüş F, Avcı N, Boztok Özgermen DB, Sağlam M. Retrospective evaluation of diseases in wild birds brought to Aksaray University Veterinary Faculty Animal Hospital Surgery Clinics: 102 cases (2020-2023). Vet Hekim Der Derg 95(2): 140-148, 2024. DOI: *10.33188/vetheder.1455874*

* *Sorumlu Yazar e-posta adresi / Corresponding Author e-mail address:* fehmiyegumus@aksaray.edu.tr

1. Introduction

Turkey is a suitable country for many bird species to shelter and find nutrition due to its geographical location, diverse climates, rich natural resources, and location on the migration route of birds (1,2). Approximately 465 bird species have been observed in Turkey and a quarter of these bird species being non-breeding birds that migrate to Turkey only in winter (3).

A study conducted in Aksaray Ihlara Valley in 2010-2011 examined 171 bird species. Of these, 60 were native, 77 migrated in summer, and 34 migrated in winter. According to international conservation criteria, three of these species were vulnerable, four were threatened, and seven were near threatened (4).

The natural habitats of wild animals have been reduced and restricted due to rapid urbanization, technological advances, poaching, and climate change. This situation poses a threat to the survival of animals (5). Wild birds are also crucial for maintaining a healthy natural balance (6,2). As with other animals, surgical diseases in birds can be classified into two groups: orthopedic and non-orthopedic diseases, such as soft tissue disorders and ophthalmic diseases. Avian species are particularly sensitive and require careful management, including hospitalization, appropriate treatment, post-operative care, and rehabilitation (7).

The objective of this study was to identify the diseases found in wild birds brought to the Aksaray University Faculty of Veterinary Medicine Animal Hospital Department of Surgery Clinic between 2020 and 2023, and to investigate the distribution of these diseases and to ensure that the results obtained provide information for future studies. The survival rates and treatment outcomes of the animals were not included in the scope of the study.

2. Material and Methods

The study material consisted of a total of 102 wild birds of various species, breeds, and sexes, that were brought to Aksaray University Veterinary Hospital, Department of Surgery, by the Directorate of Nature Conservation and National Parks between 2020 and 2023. The study material consisted of 37 red hawks, 16 storks, 7 owls, 5 pelicans, 5 pigeons, 4 swifts, 2 sandpipers, 4 kestrels, 3 crows, 2 hawks, 2 falcons, 3 cuckoos, 2 flamingos, 3 goldfinches, 2 ibis, 3 gray herons, 1 raven and 1 skylark (Table 1).

Two groups of animal diseases were examined: orthopedic and non-orthopedic. Orthopedic conditions were assessed as fractures, dislocations, and arthrosis. While non-orthopedic issues were categorized as soft tissue, ophthalmologic, neurologic, and other diseases. After a routine physical examination, ophthalmologic, orthopedic, and neurologic evaluations were conducted. Direct and indirect radiographic examinations were performed using the Fujifilm Fcr Prima T2 FVS-1000 X-ray machine. At least two-way radiographic images were obtained using 45-55 kV 1.3-5 mAs and archived.

Table 1: Distribution rates of bird species.
Tablo 1: *Kuş türlerinin dağılımları.*

Bird species	Number of cases (n)	Ratio
Red Falcon	37	36.27%
Stork	16	15.69%
Owl	7	7%
Pelican	5	4.90%
Pigeon	5	4.90%
Kestrel	4	3.92%
Others	28	27.45%
Total	**102**	**100%**

Following an orthopedic and radiographic examination, the diagnosis was made and the location of the dislocation in the wing and extremity was determined. An analgesic, Butorphanol tartrate (Butomidor®, Richter Pharma AG, Austria) 0.5 mg/kg, was administered intramuscularly before osteosynthesis. For anesthesia induction, intramuscular administration of ketamine hydrochloride (Keta-Control®, Turkey) at a dose of 1.5-2 mg/kg and medetomidine HCl (Domitor®, Zoetis, Finland) at a dose of 60-85 mg/kg was administered. Isoflurane (Forane, Abbott Lab. UK) was used to maintain anesthesia during prolonged operations. Enrofloxacin (Baytril® 50 injectable; Bayer Korea, Korea) was administered subcutaneously daily (15 mg/kg) during the postoperative period. The treatment method was chosen according to the type of fracture.

3. Results

The study identified three orthopedic diseases: arthrosis (n=3), dislocation (n=5) and fracture (n=38). The highest number of fractures by anatomical region was found in the ulna with a rate of 33.33%, while the rate of fractures in the radius was 27.45% (Figure 1). Table 2 provides the number of fractures detected by anatomical region and the proportions of fractures found in the bones.

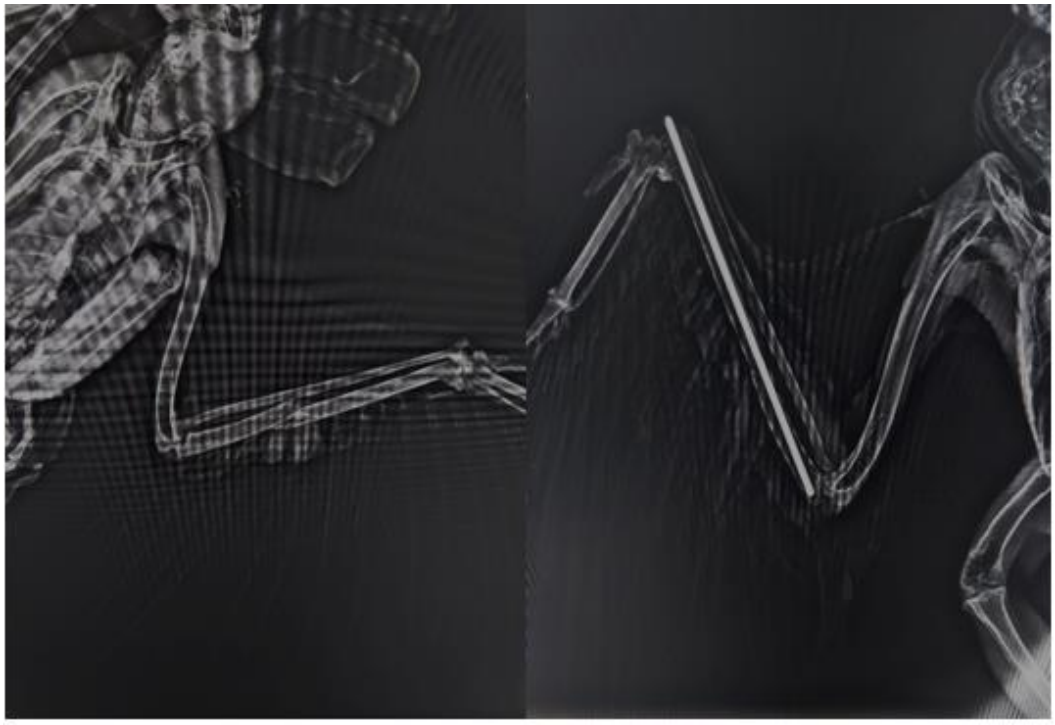

Figure 1: Treatment of ulna fracture in a Red Hawk with an intramedullary pin
Şekil 1: *Kızıl şahindeki ulna kırığının intramedullar pin ile sağaltımı*

Management was based on whether the fractures were comminuted or non-comminuted, open, or closed. For this purpose, an '8'-shaped bandage was used in 15 cases, while intramedullary pins and Cerclage wires were used in 12 cases and, rarely, external fixation was used in one case (n=1). In cases where there is infection accompanying fractures, nerve damage, joint arthrosis, bone necrosis, and muscle maceration, wing amputation (n=10) was the preferred treatment option.

Table 2: Distribution rates of fractures based on their anatomical regions.
Tablo 2: *Anatomik bölgelere göre kırıkların dağılım oranları.*

Anatomical Region	Number of Fractures	Ratio
Humerus	5	9.80%
Radius	14	27.45%
Ulna	17	33.33%
Carpus	3	5.88%
Metacarpus	5	9.80%
Femur	2	3.92%
Tibiotarsus	5	9.80%
Total	**51**	**100%**

Table 3: Classification of other diseases in the birds.
Tablo 3: *Kuşlardaki diğer hastalıkların karşılaştırılması*.

			Number (n)
OTHER DISEASES	**Ophthalmologic Diseases**	Blepharitis	2
		Conjunctivitis	1
		Nystagmus	1
		Hyphema	1
		Microphthalmia	1
	Neurological Diseases	Head Trauma	3
		Paralysis	2
	Soft Tissue Diseases	Wound	24
		Soft Tissue Injury	19
		Bowel Perforation	2
	General Condition Disorders	Hemothorax	1
		Gastric Dilation	1
		Hypothermia and Hypoglycemia	13

The most common soft tissue diseases were wounds (n=24), followed by soft tissue injuries (n=19), and gastrointestinal tract perforations (n=2) (Figure 2). Fresh wounds without discharge or infection were treated with sutures, while chronic and infected wounds were treated with wound dressings. For infections of chronic wounds, the wound area was covered with 0.2% nitrofurazone soluble dressing (Furacin, Zentiva) and Centella Asiatica (1% Madecassol pomade, Bayer). Gastrointestinal tract perforations were sutured with suitable suturing techniques.

Figure 2: A case of intestinal perforation in a red hawk.
Şekil 2: *Bir kızıl şahinde kursak perforasyonu olgusu.*

The study identified several ophthalmologic diseases, including blepharitis (n=2) and conjunctivitis (n=1) due to infections, nystagmus (n=1) and hyphema (n=1) resulting from trauma, and congenital microphthalmia (n=1). Treatment for blepharitis (n=2) and conjunctivitis (n=1) involved administering topical oxytetracycline hydrochloride and polymyxin B (Terramycin eye ointment 5 mg/gr, Pfizer) and tobramycin (Tobrased 0.3% eye drop). Dexamethasone (Onadron Simple 0.1%, İ.E Ulugay) was administered to a bird with hyphema. The nystagmus (n=1) recovered spontaneously after treatment for head trauma.

Figure 3: A Red Hawk presented with a case of hyphema in the eye following head trauma.
Şekil 3: *Bir Kızıl şahinde kafa travmasını sonucu gözde şekillenen hifema olgusu.*

Within the scope of neurological disorders, head trauma (n=3) and wing nerve injuries (n=2) were encountered. Among ophthalmologic diseases, two cases of head trauma were accompanied by hyphema and nystagmus. Three cases with head trauma were administered intravenous 20% mannitol, resulting in complete recovery for two cases and unfortunately, one patient died. In two cases with paralysis, limb and wing amputation were performed.

One case of hemothorax and one case of gastric dilatation were detected, along with 13 cases of hypoglycemia due to malnutrition, all of which are shown in Figure 4. Birds that were experiencing hypothermia and hypoglycemia were transferred to the intensive care unit to regulate their body temperature and some were fed orally. Intravenous 5% dextrose was administered to the birds with poor general condition.

Figure 4: Image of an owl with hypothermic shock and hypoglycemia.

Şekil 4: *Hipotermik şok ve hipoglisemi görülen bir baykuşa ait görüntü.*

4. Discussion and Conclusion

In the study conducted by Sarıerler and Kılıç (8) at the Faculty of Veterinary Medicine of Aydın Adnan Menderes University between 1999 and 2003, a total of 48 avians were recorded. Aslan et al (2) identified 26 wild animals with wounds or fractures over two years. Pamuk et al (9) reported a total of 45 domestic and wild avians recorded during their 8-year study at Afyon Kocatepe University Faculty of Veterinary Medicine. A 13-year retrospective study conducted at Aydın Adnan Menderes University Faculty of Veterinary Medicine reported the recording of 120 avians,85 cage birds, and 35 wild bird animals (3). The present study found that Salt Lake and its surroundings, as well as Melendiz Stream located within the borders of Aksaray province, are home to hundreds of bird species that provide shelter, wintering, and incubation opportunities. It is believed that the number of wild birds brought to our veterinary hospital has reached 102 in just 3 years.

In a study conducted in Brazil, 413 wild birds were investigated by necropsy. Of the 413 cases most common causes of death was metabolic/nutritional diseases (12.10%) followed by traumatic injuries (8.47%) and

infectional diseases (19.11%) (16). In another study conducted in Toronto Wildlife Centre, Canada collision injuries of Songbirds were investigated. A total of 563 birds with different species were evaluated from 2013 to 2016. Of these birds the most common injury was eye trauma (n=414) followed by head trauma (n=75), fractures (n=69), soft tissue trauma (n=62), internal trauma (n=42), and others (n=136) (18). In our study, of the 102 birds most common diseases were soft tissue diseases (46%) followed by orthopedic lesions (45.09%), general condition disorders (12%), ophthalmologic diseases (5.88%) and neurological diseases (4.9%) respectively.

In a retrospective study on beak deformities in 26 birds, 5 of the cases were trauma-related beak fractures of the wild birds (19). It was concluded that the hemostasis was very important in beak fractures. In cases that hemostasis couldn't be achieved quickly the mortality rate was high due to traumatic shock and hemorrhage. In our study none of the birds had beak deformities. This may be due to the type of the trauma the bird was exposed.

In cases of bird injury, first aid and emergency intervention are crucial (10). Additionally, it is essential to conduct a general examination of the injured bird and obtain anamnesis, if possible, regarding the cause of injury and wound condition. Complicated fractures may lead to malnutrition, dehydration, and shock in a short time. To prevent complications such as shock, emergency treatments should be administered, and fractures should be temporarily stabilized. After the general condition has improved, osteosynthesis should be planned (11,10). In our study, we regulated the general conditions of hypothermal shock and hypoglycemia due to malnutrition with appropriate fluid treatments and drug administration, aiming to prevent dehydration and shock.

Akın et al. (3) found that orthopedic diseases were more prevalent than other diseases. Kibar and Bumin (6) reported that wing fractures were the most common (80%). In studies conducted on wild birds, humerus, radius, and ulna were the most frequently reported wing fractures (6,10,11). Aslan et al. (2) reported that fractures of the wings occurred more frequently in the radius, ulna, humerus, and metacarpus, respectively. In the present study, we found that 61.97% of the fractures occurred in the wing. Ulna fractures (33.33%) were more common than radius fractures (27.45%). Based on the literature provided by Kurtdede (13), this study found that a common clinical finding in cases of wing fractures is that the affected wing hangs downwards. A study was conducted on 119 wild birds of prey with femur fractures, and either conservative treatment (cage rest) or surgical repair was performed. The healing rate for comminuted fractures was found to be 91%. The authors reported that surgical complications occurred in 10 cases and led to euthanasia in 4cases (14). In the present study, we found that the femur had the lowest fracture incidence rate at 3.92%.

Demir and Gerbaga Ozsemir studied trauma-related ocular and neurological diseases in 114 birds (17). Of the 114 birds, 102 were wild birds and 12 were cage birds. 26.3% of the cases had ocular problems involved the anterior segment (86.6%), posterior segment (13.3%) and both segments (3.3%). In 30 of the ophthalmologic cases 12 had hyphema, 8 had periorbital swelling, 5 had corneal ulcer, 2 had corneal perforation, 4 had palpebral laceration and 2 had cataract. In our study 6 bird had ocular disorders due to trauma. 2 birds had blepharitis and one bird had conjunctivitis due to infections, one bird had nystagmus and one bird had hyphema, and one bird had congenital microphthalmia. The previous studies (17) showed that the most common ocular disease of the birds was hyphema. In contrast to Demir and Gerbaga Ozsemir's results in our study the most common ocular disease was blepharitis.

It is important to perform necessary interventions promptly following injury or fracture in wild birds. Failure to do so may result in open fractures that can quickly become infected, reducing the likelihood of successful treatment (15, 2).In our study, wing amputation was the first choice of treatment (n=10) in chronic cases with delayed intervention in the presence of infection, nerve damage, joint arthrosis, the presence of bone necrosis, and muscle maceration.

As a conclusion, all wild animals that have somehow ended up in human hands should be subjected to a detailed physical examination, even if they appear intact at first sight. A rapid diagnosis should be made,

preferably with the aid of a radiological examination. Especially in cases that require emergency intervention, it is crucial to perform the indicated treatment without delay and to maintain follow-up care. In current conditions, the advancement of technology and widespread communication have made it easier for veterinarians to access wild animals. This enables correct diagnosis and treatment interventions to be administered, allowing the animals to be returned to their habitats.

Conflict of Interest

The authors declared that there is no conflict of interest.

Funding

This work is not supported by any Project.

Authors' Contributions

Motivation / Concept: Fehmiye Gümüş, Mehmet Sağlam
Design: Fehmiye Gümüş, Başak Boztok Özgermen
Control/Supervision: Nihan Avcı, Mehmet Sağlam
Data Collection and / or Processing: Fehmiye Gümüş
Analysis and / or Interpretation: Nihan Avcı
Literature Review: Başak Boztok Özgermen
Writing the Article: Fehmiye Gümüş
Critical Review: Başak Boztok Özgermen, Mehmet Sağlam

Ethical Statement

All procedures involving study animals in the experiment were approved by Aksaray University Animal Experiments Local Ethics Committee (No:2024/2-15).

References

1. Kiziroğlu İ. Türkiye kuşları. Orman Genel Müd. Eğitim Dairesi Başkanlığı Yayın ve Tanıtma Şube Müd. Basım Tesisleri, 1989; 312s., Ankara.
2. Aslan L, Özdemir A, Karasu A, Özkan C, Gençcelep M, Durmuş A, Akgül Y. Van Gölü havzasında 2006-2008 yılları arasında yabani kuşlarda yaralanma ve kırık olgularının tedavileri. Yüzüncü Yıl Üniversitesi Veteriner Fakültesi Dergisi 2009; 20(2):7-12.
3. Akın İ, Yaygıngül R, Derincegöz OÖ, Tatlı ZB, Şen ZB, Bellek CG, Bulut O, Sarıerler M, Belge A, Kılıç N. Adnan Menderes Üniversitesi Veteriner Fakültesi Cerrahi Kliniğine getirilen kanatlı hayvanların değerlendirilmesi: 120 olgu (2000-2013). Animal Health Production and Hygiene 2015, 4(1), 355 – 358.
4. Tabur M. Ihlara vadisinin (Aksaray) kuşları. Erciyes Üniversitesi Fen Bilimleri Enstitüsü Dergisi 2014; 30(3):162-173
5. Parlak K, Arıcan M. Travma hastaliklarinin görülme insidansi. Turkiye Klinikleri J Vet Sci Surg-Special Topics 2015;1(3):82-7
6. Kibar M, Bumin A. Yırtıcı kuşlarda ateşli silah yaralanması sonucu oluşan kırıkların değerlendirilmesi: 85 Olgu (1998-2005). Kafkas Üniversitesi Veteriner Fakültesi Dergisi 2006, 12(1):11-16.
7. Altıntaş G. Evcil ve yabani kanatlı hayvanlarda görülen cerrahi hastalıkların etiyolojisi, klinik bulguları ve sağaltımı üzerine çalışmaların değerlendirilmesi. Yüksek Lisans Tezi 2021.
8. Sarıerler M, Kılıç N. Adnan Menderes Üniversitesi (ADÜ) Veteriner Fakültesi Cerrahi Kliniğine getirilen hastalara toplu bir bakış (1999-2003). Uludağ Univ J Fac Vet Med 2003;22:75-79.
9. Pamuk K, Sarıtaş KZ, Demirkan İ, Korkmaz M. Afyon Kocatepe Üniversitesi Veteriner Fakültesi Cerrahi kliniğine getirilen hastaların değerlendirilmesi: 1090 olgu (2001-2008). Kocatepe Veteriner Dergisi 2009; 2(1): 29-33

10. Degernes LA, Lind PJ, Olson DE, Redig PT. Evaluating avian fractures for use of methyl methacrylate orthopedic technique. J Assoc Avian Vet 1989;3(2):64-67
11. Joseph V. Emergency care of raptors. Vet Clin North Am Exot Anim Pract 1998; 1: 77-98.
12. Özsoy S. Yabani kuşlarda ekstremitelerin ortopedik problemlerinin klinik değerlendirilmesi. İstanbul UniVet Fak Derg 1996, 22(1):107-125.
13. Kurtdede A. Kafes Kuşlarının Muayenesi ve Hastalıkları. Ankara: Azim Matbaası, p.68, 70; 2002.
14. Vigneault A, Fitzgerald G, Desmarchelier M. A retrospective study of femoral fractures in wild birds of prey: 119 cases. Journal of zoo and wildlife medicine: official publication of the American Association of Zoo Veterinarians, 2021; 52(2), 564–572. https://doi.org/10.1638/2020-0192
15. Komnenou AT, Georgopoulou I, Savvas I, Dessiris A . A retrospective study of presentation, treatment, and outcome of freeranging raptors in Greece. J Zoo Wildl Med 2005; 36(2): 222-228.
16. Echenique, JV, Soares MP, Albano APN, Bandarra PM, Schild AL. Doenças de aves silvestres no sul do Rio Grande do Sul. Pesquisa Veterinária Brasileira 2020; 40:121-128.
17. Demir A, Gerbaga Ozsemır K. Ocular Lesions and Neurologic Findings in Traumatic Birds: A retrospective evalution of 114 cases. Erciyes Üniversitesi Veteriner Fakültesi Dergisi 2021;18(1):19-25. https://doi.org/10.32707/ercivet.878004
18. Hudecki J, Finegan E. Songbird collision injuries during migration season. J Wildlife Rehab 2018; 38(2): 7-11.
19. Demir A, Gerbaga Ozsemir K. Retrospective study of beak deformities in birds beak deformities in birds. Turk Vet J 2021; 3(1):13- 20.