

## TREATMENT OF A MANDIBULAR FRACTURE IN A GRAY HERON

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### Keywords

Beak,  
broken,  
fixation,  
grey heron

### ABSTRACT

Trauma in poultry can be caused by attacks from other animals, foreign objects penetrating the body, getting trapped in cages, injuries caused by hunters, and hitting hard objects during flight. In literature, non-displaced fractures caused by beak injuries in poultry have been reported to have a good prognosis. Cases of fractures with displacement between fragments can also be treated, but situations where complete anatomical reduction cannot be achieved or occlusion disorders that may occur during the postoperative period can cause misalignment of the beak, feeding difficulties in the future, and difficulties in grasping during other daily activities. This study aims to present the treatment of a mandibular fracture in a gray heron.

### INTRODUCTION

Traumas in birds may occur due to attacks from other animals, penetration of hard foreign objects such as wire or metal, entrapment in cages, injuries caused by hunters, and collisions with hard objects during flight. In the literature, non-displaced fractures related to beak traumas in birds have been reported to have a good prognosis. Cases of fractured fragments with displacement can also be treated, but situations where full anatomical reduction cannot be achieved or occlusion disorders that may occur during the postoperative process can lead to improper alignment of the beak, difficulties in feeding in the future, and difficulty in grasping during other daily activities. The prognosis for multi-piece fractures is often poor due to the possibility of infection and potential bone necrosis. Additionally, in cases where vascularization is damaged, ischemic necrosis of the bone and surrounding soft tissues may occur. Prognosis for fractures near the joint is poor, so achieving full anatomical reduction is more important in treating these fractures. Surgical interventions can also lead to iatrogenic damage and consequently a poor prognosis. The aim before treating the fracture should be to reduce pain, control any bleeding in the fractured area, and improve the general condition of the animal. If the animal cannot feed due to the fracture, hand feeding or placement of an esophagostomy tube should be considered. Once the animal's condition has been stabilized through these measures, surgical intervention can be initiated. In cases of material loss lesions in the beak, filling procedures can be performed using acrylic materials after the affected area is cleaned. In cases of mandible and maxilla fractures, fixation of the fractured fragments can be achieved using pins and cerclage wires. Tissue adhesives can also be used in small cracks and fractures in the beak. Most birds can easily adapt to the treatment method applied and continue their lives<sup>1,2,3,4,5,6,7</sup>. This study aims to present the treatment applied in a grey heron with a mandible fracture.

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**CASE REPORT**

A grey heron bird found accidentally in nature was brought to our clinic by the officials of the Sivas Provincial Directorate of Forestry Nature Conservation and National Parks Unit. During

the clinical examination, an abnormal angle and gap between the maxilla and mandible were detected, which was found to be caused by bilateral mandibular fractures (Figure 1a and 1b). Food and water restriction were applied during the preoperative period.



Figure 1. Clinical view of mandibular fracture in the grey heron bird, a) from the left side, b) from the right side.

Sevoflurane was used for anesthesia of the grey heron. After general anesthesia was achieved, the patient was fixed on the operation table in a lateral position using medical adhesive tape. The

patient was monitored. The area was prepared according to aseptic and antiseptic rules, and covered with sterile drapes, leaving the mandible exposed (Figure 2).



Figure 2. Sterile draping of the area.

The superficial curettage of the fracture line was performed using a No. 11 blade. A 0.8 mm diameter Kirschner wire was inserted caudally from the fracture line using a low-speed medical drill (Figure 3a). After the free end of the pin exited the mandibular canal, it was disconnected from the drill and the same procedure was applied

with a contralateral Kirschner wire of the same diameter. The free ends of the pins were then removed from the caudal surface of the mandible on both sides (Figure 3b), and the fracture was reduced and pushed cranially using a retrograde technique inside the mandible.

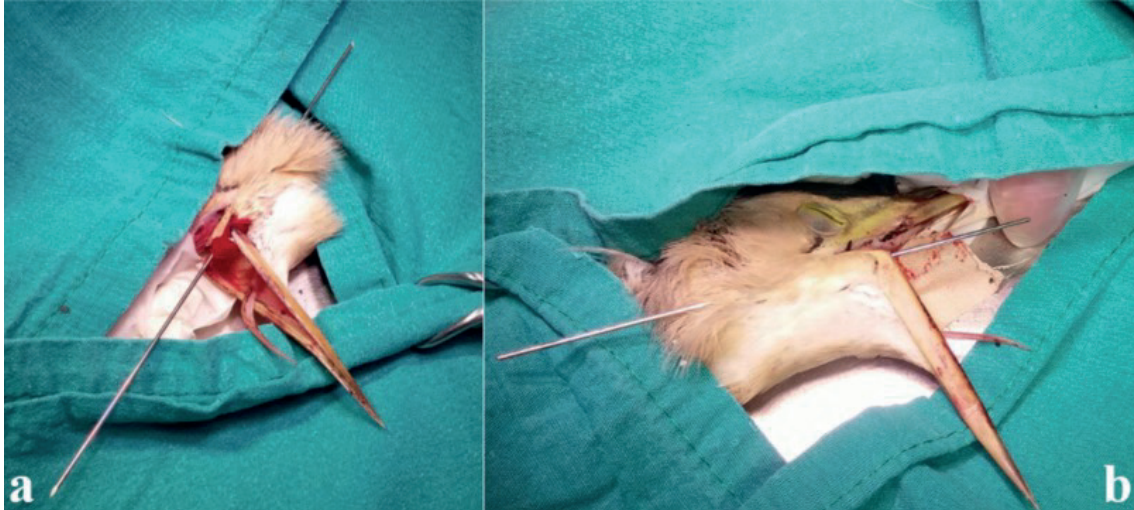


Figure 3. a) Kirschner wire application to left and b) right Corpus mandibulae.

The occlusion of the beak was checked (Figure 4a and 4b). After confirming that the occlusion

was achieved, anesthesia was discontinued and the patient was awakened.



Figure 4. a and b) Evaluation of the occlusion of the beak.

After evaluating the vital parameters and ensuring that they were at physiological levels, the patient was handed over to the authorities of the Nature Conservation and National Parks Department. Feeding through a feeding tube was recommended. The patient returned for a post-

operative examination 10 days later and was found to be in good general condition. Control radiographs were taken, and the patient was handed over to the authorities again (Figure 5a and 5b). The patient could not be followed up on in the subsequent period.

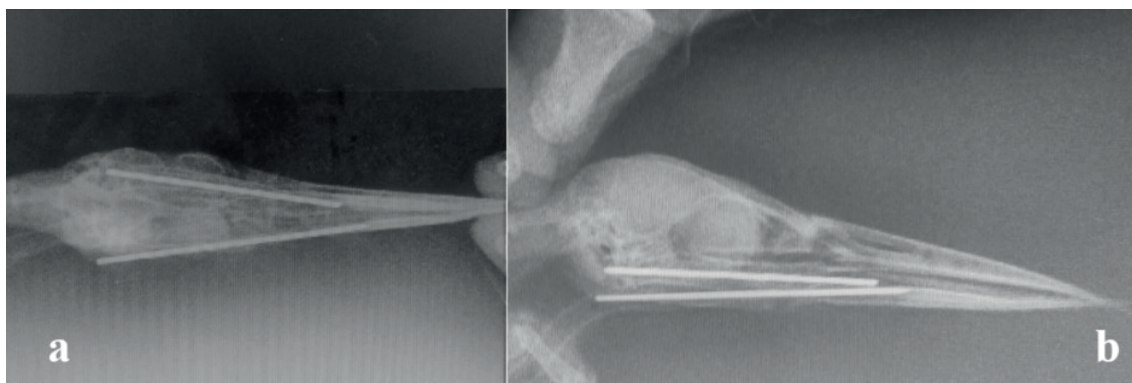


Figure 5. 10th day postoperative control radiographs of the grey heron in a) ventro-dorsal, b) latero-lateral plane.

## DISCUSSION

Among the surgical treatment techniques applied in the beaks and bone fractures of winged animals, external fixation applications occupy an important place. Obtaining the desired stabilization can be difficult due to the thinness of the bones and beak during the application of such implants. In addition, pin site infection is one of the most common complications encountered after the application of external fixators<sup>5</sup>. The treatment of the mandibular fracture that occurred in the grey heron bird, which was brought to the clinic after being found in nature, was performed by applying Kirschner wire intramedullary into the beak. Due to the location of the fracture and the thinness of the beak, the pin was applied retrogradely into the mandibular medulla to prevent possible stress fractures that could occur in the future by piercing the beak with multiple pins. No complications were observed during the postoperative follow-up period up to day 10, during which the patient could be monitored.

Before any corrective surgery is performed on the beak of any bird species, clinicians should always assess whether growth plates are closed or not; however, clinical evaluation may be challenging<sup>9</sup>. In the grey heron brought to our clinic, a fracture was detected in the mandibular corpus as a result of clinical and radiological examination, and an application that could cause growth deformities in the beak of the grey heron bird was avoided.

Although no clear percentage or prevalence can be determined, mandibular fractures in the lower beak in Psittacine birds, songbirds, and raptors, and upper or lower beak (mandible and premaxilla) fractures in long-billed birds (such as storks, herons, and ibises) are common injuries. The beak of water birds such as ducks, geese, and swans is thin and soft, which can lead to higher fracture rates due to traumatic events<sup>8</sup>. The grey

heron bird brought to the clinic is a long-billed bird, and the mandibular fracture that occurred was thought to be due to hunting or gripping.

Malocclusion or misalignment of the mandible disrupts normal beak function and endangers the ability to eat normally. In such cases, encountering feeding problems is inevitable. If the resulting malocclusion cannot be corrected, euthanasia must be considered as an alternative outcome<sup>5</sup>. The treatment of the mandibular fracture detected in the grey heron bird that is the subject of the study was performed by applying Kirschner wires into the mandibular medullary canal. After reduction, it was evaluated whether the beak could open and close properly to perform its physiological function. In addition, it was observed that occlusion was successfully achieved.

For predatory birds living in nature, the use of the beak is very important for survival. The treatment of mandibular fractures that may occur in predatory birds with thin and long beak structures, such as herons, using Kirschner wires, can be evaluated as an alternative treatment method.

## Conflict of interest statement

The authors declare that they have no conflicts of interests.

## Acknowledgements

None.

## REFERENCES

1. Altman RB. Beakrepair: Acrylics. In: Avian Medicine and Surgery. Philadelphia, WB Saunders, p. 787-799; 1997.
2. Chitty J. Beakrepair in a red-crowned crane. Association of Avian Veterinary. 2014; 113–115.
3. Clipsham R. Rhamph orthotics and surgical corrections of maxillofacial defects. Seminars in Avian and Exotic Pet Medicine. 1994;3:92–9.
4. Gill JH. Avian Scin Disease. Veterinary Clinics of North America: Exotic Animal Practice. 2001;4(2):463-492.
5. Monks D, Miles S, Sciacca E, Tozer K. Treatment of Bilateral Mandibular Fractures in a Goose (*Anser anser domesticus*). Annual Conference Proceedings Auckland New Zealand. 2017;25:51-54.
6. Morris PJ, Weigel JP. Methacrylate beak prosthesis in a marabou stork. Journal of the Association of Avian Veterinarians (*Leptoptilos crumeniferus*). 1990;4(2):103–107.
7. Worell AB. Dermatological condition saffecting the beak, claws, and feet of captive avian species. Veterinary Clinics of North America: Exotic Animal Practice. 2013;16(3):777–799.
8. Carrasco DC, Dutton TAG, Shimizu N, Sabater M, Forbes NA. Distraction Osteogenesis Correction of Mandibular Ramis Fracture Malunion in a Juvenile Mute Swan (*Cygnus olor*). Journal of Avian Medicine and Surgery. 2016;30(1):30-38.