

Surgical correction of transverse fracture of maxilla in an Indian ringneck parakeet (*Psittacula krameri*)- A case report

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Abstract

A 3-year-old female Indian ringneck parakeet (*Psittacula krameri*) was presented in the emergency ward with a history of traumatic injury. Clinical examination revealed a transverse fracture of the maxilla. The patient was taken under immediate surgical correction right after completing the physical parameters assessment. The correction was done under injectable anaesthesia with ketamine @ 40 mg kg⁻¹ and xylazine @ 3 mg kg⁻¹. The fracture reduction was done by manual compression and stabilized by using an orthopaedic wire and prolene suture. The present study describes the successful management of a fractured maxilla in an Indian ringneck parakeet.

Keywords: Fracture, Indian ringneck parakeet, Maxilla

Highlights

- A fracture was detected in the maxilla of an Indian ringneck parakeet caused by ceiling fan trauma.
- The parakeet was successfully anaesthetized using ketamine and xylazine combination.
- Through and through orthopaedic wiring was done in figure eight fashion manner.
- Prolene suture was further applied to stabilize the fracture.

Indian ringneck parakeet, also known as rose-ringed parakeet, is a common bird reared as a pet in a lot of Indian households. Most of the time, they hold hanging wooden sticks with their tying leg on them. The chances of this bird getting injured are therefore common compared to other pet birds.

In birds, the beak represents the opening of the oral cavity, which consists of both living and non-living tissues. The maxillary and mandibular jaw bones form the beak, the maxilla is also known as the upper mandible. The presence of numerous blood vessels and nerve endings in the maxilla makes it vulnerable to pain and bleeding if injured (Worell, 2013).

A 3-year-old female Indian ringneck parakeet was presented in the ward with a history of traumatic injury 8-10 hours prior to presenting in the ward. On physical examination, the beak showed a complete transverse fracture of the maxilla and an avulsion of the proximal fractured part with extensive bleeding.

The bleeding was checked temporarily with sterile gauze soaked with diluted adrenaline (1 mL adrenaline 1:1000, with 9 mL of 0.9% of normal saline), and a temporary dressing was done (Fig. 1) for better observation of the wound area (Ring *et al.*, 2014).

Due to the seriousness of the condition and bleeding, the patient was taken into the operating room for further detailed intervention. The patient was anaesthetized by

injecting ketamine and xylazine @ 40 mg kg⁻¹ and @ 3 mg kg⁻¹, respectively (Vesal and Eskandari, 2006) and administered intramuscularly by mixing them into the same syringe. The bird was fully anaesthetized within 2 minutes of the injection. The injury was further assessed and planned for reduction and immobilization of the fracture by wiring. The operative site was prepared for aseptic surgery. Supplementary oxygen and an electronic heating pad were installed as supportive care.

The surgery was initiated by gently drilling holes with the help of a 1.5 mm Steinmann pin across the maxilla proximally and rostrally to the fracture line (Fig. 2).

A 24-no. stainless steel orthopaedic wire was passed through both holes in a figure-eight (8) fashion, thereby reducing the fracture ends manually with the help of the fingers and tightening the wire gently (Fig. 3).

A size-0 prolene suture was further applied in through and through manner across the maxilla and tightened gently to avoid unwanted access tension (Fig. 4).

The bird was given meloxicam @ 1 mg kg⁻¹ (Beaufrère *et al.*, 2019) body weight intramuscularly as analgesia and injection enrofloxacin @ 15 mg kg⁻¹ intramuscularly (Flammer *et al.*, 1991). Following surgery, the site was further cleaned with betadine (5%) solution, and cleared off of debris and blood. Metrogyl DG ointment was applied as dressing measures. The bird was administered with oral enrofloxacin drops twice

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Upper maxillary fracture repair in a parakeet



Fig. 1. Transverse fracture in maxilla of an Indian ringneck parrot due to the hit from ceiling fan



Fig. 2. Drilling hole through the maxilla



Fig. 3. 24 no. orthopedic wire tightened in an eight (8) wave fashion



Fig. 4. Through and through prolene suture along with orthopedic wire tightened in eight (8) wave fashion

daily for 5 days along with Melonex suspension orally for 3 days @ 15 mg kg⁻¹ and @ 1 mg kg⁻¹, respectively.

With this protocol of anaesthesia, the patient recovered completely from the anaesthesia after 45 minutes. The bird was offered liquid food, i. e. fruit juice for 3 weeks. From 3 weeks onward, it started picking its normal food. On day 45 the external wire and sutures applied over the fracture line were removed. The bird was observed for a period of 60 days post-operatively and recovery was uneventful.

To the author's knowledge, there is a paucity of reports on the above-discussed type of beak trauma, and the present technique used to manage the condition was novel in an Indian ringneck parakeet. Cases like this sometimes prevail as an emergency, and correction of these needs to be done instantly after assessing the situation. Sometimes help of diagnostic modalities is necessary to gain access to more information. However, in this case, physical examination revealed enough information, and the physical status of the bird warranted immediate surgical intervention. In earlier studies, the surgical management of similar fractures has been discussed, where it showed good reduction and management of palatine bone luxation in a blue and gold macaw (Foerster *et al.*, 2000). Surgical intervention in the pterygoid bone of macaw cadavers has been reviewed, though the procedure was not ideal for that type of fracture. Cases were reviewed to gain knowledge

regarding the management of beak-related clinical conditions, where a case of rostromaxillopalatal luxation was managed using hypodermic needles in a red-crowned parakeet (Hébert, 2019). Beak fracture or broken beak generally heals by growth and infiltration of keratin protein by ¼ to ½ inch per month, though there is a chance of infection from opportunistic bacteria present in oral flora (Speer and Powers, 2016).

In break fractures of parakeet, early response and management is a crucial part, which includes the haemostasis and stabilizing the bird with necessary steps, as in birds, excessive blood loss can cause both haemostatic and traumatic shock in a short time. The proper mode of immobilization of the fractured beak can further secure the fore coming health status and recovery of the bird.

Conflict of interest: Authors have no conflict of interest in this study.

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REFERENCES

- Beaufrère H, Laniès D, Kabakchiev C, Axelson R and Zur Linden A, 2019. Multiple fractures and luxations of palatofacial bones in a hawk-headed parrot (*Derophtus accipitrinus*). J Am Vet Med Assoc, 254(2): 251-256, doi: 10.2460/javma.254.2.251
- Flammer K, Aucoin DP and Whitt DA, 1991. Intramuscular and oral disposition of enrofloxacin in African grey parrots following single and multiple doses. J Vet Pharmacol Ther, 14(4): 359-366, doi: 10.1111/j.1365-2885.1991.tb00849.x
- Foerster SH, Gilson SD and Bennett RA, 2000. Surgical correction of palatine bone luxation in a blue-and-gold macaw (*Ara ararauna*). J Avian Med Surg, 14(2): 118-121, doi: 10.1647/1082-6742(2000)014[0118:SCOPBL]2.0.CO;2
- Hébert JA, 2019. Closed reduction of a rostromaxillopalatal luxation in a red-crowned parakeet (*Cyanoramphus novaezelandiae*). J Avian Med Surg, 33(3): 285-288, doi: 10.1647/1082-6742-33.3.285
- Ring J, Beyer K, Biedermann T, Bircher A, Duda D *et al.*, 2014. Guideline for acute therapy and management of anaphylaxis: S2 Guideline of the German Society for Allergology and Clinical Immunology (DGAKI), the Association of German Allergologists (AeDA), the Society of Pediatric Allergy and Environmental Medicine (GPA), the German Academy of Allergology and Environmental Medicine (DAAU), the German Professional Association of Pediatricians (BVKJ), the Austrian Society for Allergology and Immunology (ÖGAI), the Swiss Society for Allergy and Immunology (SGAI), the German Society of Anaesthesiology and Intensive Care Medicine (DGAI), the German Society of Pharmacology (DGP), the German Society for Psychosomatic Medicine (DGPM), the German Working Group of Anaphylaxis Training and Education (AGATE) and the patient organization German Allergy and Asthma Association (DAAB). Allergo J Int, 23: 96-112, doi: 10.1007/s40629-014-0009-1
- Speer B and Powers LV, 2016. Anatomy and disorders of the beak and oral cavity of birds. Vet Clin North Am Exot Anim Pract, 19(3): 707-736, doi: 10.1016/j.cvex.2016.04.003
- Vesal N and Eskandari MH, 2006. Sedative effects of midazolam and xylazine with or without ketamine and detomidine alone following intranasal administration in ring-necked parakeets. J Am Vet Med Assoc, 228(3): 383-388, doi: 10.2460/javma.228.3.383
- Worell AB, 2013. Dermatological conditions affecting the beak, claws, and feet of captive Avian species. Vet Clin North Am Exot Anim Pract, 16(3): 777-799, doi: 10.1016/j.cvex.2013.05.005

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