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Treatment of traumatic esophageal rupture in a great white pelican (*Pelecanus onocrotalus*): A case report

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Abstract
In the present case study, an adult Great White Pelican was presented with an esophageal rupture in the neck region with ingestion of large fish; it was a complete esophageal tear exposing the throat, cervical vertebra, jugular vein, and trachea. The pelican's throat was severely congested with blood clots. Esophageal rupture is very rarely seen in birds. The case was corrected surgically under local anesthesia without intubation. The bird recovered successfully within 15 days without any secondary complications. Avoiding excess handling and providing habitat similar to nature can be extremely useful for the treatment of esophageal rupture in birds.

Keywords: surgical management, esophageal rupture, great white pelican

Introduction
The esophagus is a flexible musculo-membranous tube that connects the mouth to the crop in avian (Kumar *et al*., 2016) [1]. Unlike in animals, the large portion of the esophagus lies in the cervical region in birds. The open wounds at the cervical region may lead to tears in the esophagus, trachea, or fistulation of the crop. It is commonly seen in fighting birds, mainly stab and carved wounds are common. We have seen the cases of ingestion of unusual items by wetland birds like plastic, rubber, shells, etc in urban landscapes (B. Anjan Kumar Prusty *et al*., 2020) [4] but very barely the cases of oesophageal rupture in birds. In the 1980s, in California, a pair of Great Blue Herons were found freshly deceased with lamprey lodged in their esophagus and they choked to death (https://www.flockingaround.com/post/can-birds-choke). Indian subcontinent plays an important role to host several migratory birds, it is estimated that over a hundred species of beautiful migratory birds fly to India in some bird sanctuaries as there is sufficient availability of depth, quality of water, and availability of food (predator species) and shelter or to escape from extreme winter of their habitat. The great white Pelican (*Pelecanus onocrotalus*) is the heaviest and one of the major winter migratory birds which are visiting peninsular north India by settling down in shallow, freshwater lakes with plenty of fish. Most of these birds settle down in Pakistan, while some fly as high as Nepal. They are carnivores, prefer to be piscivores in nature. Keetam lake which is located inside Soor Sarovar Bird Sanctuary, Agra, Utter Pradesh is one of the destinations for this giant migratory bird in the winter season (November to mid-March). In February 2019, An injured Great White Pelican (*P. onocrotalus*) was rescued and treated. After surgical correction, the bird showed favorable recovery, which is detailed in the following report.

Surgical Management and Medical Care
In February 2019 evening forest patrolling team rescued an injured great white pelican (*Pelecanus onocrotalus*) to Wildlife Veterinary Hospital which is managed by Wildlife SOS. The rescued bird was showing symptoms like an extended neck with fastened fish in the esophagus (Fig. 1). Close clinical examination revealed a complete tear of the esophagus and a deep cut at neck skin which was almost 8 inches in depth from the throat. The deep cut was exposing the severely congested throat, cervical vertebra, and trachea with blood clots. The mucosal layer of the esophagus revealed severe bleeding and congestion with a laceration.

As the throat and trachea were with lacerated injury caused by the previously ingested fish, we decided not to intubate the bird to avoid further damage to the anatomical part of the pelican. The bird was restrained gently with a blindfold. The deep incised wound was flushed with 0.9% sterile isotonic solution which was followed by removal of blood clots and debris (Fig. 2). The edges of incised skin were sprayed with 2% lignocaine solution, the skin edges were brought in opposition and sutured with polyglycolic acid suture no. 4.0 in horizontal mattress pattern followed by application of Himax ointment and 2% lignocaine spray (Fig. 3). Inj. Meloxicam @ 0.2 mg/kg BW and Inj. Enrofloxacin @ 5mg/kg BW (long-acting) was administered intramuscularly.

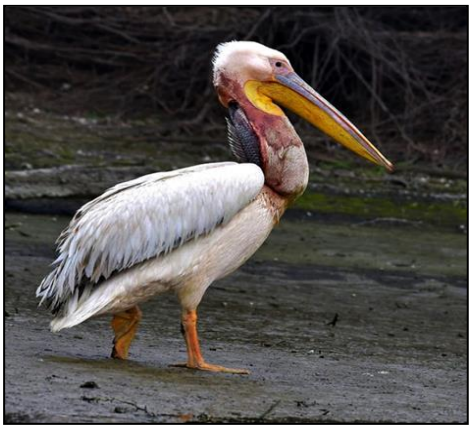

Fig 1: *P. onocrotalus* with ruprured neck due to the chocked fish.

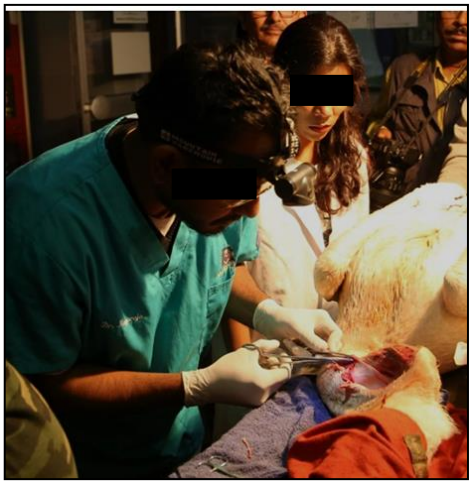

Fig 2: Lacerated injury at throat, cervical vertebrae and trachea observed after mauanl restrain

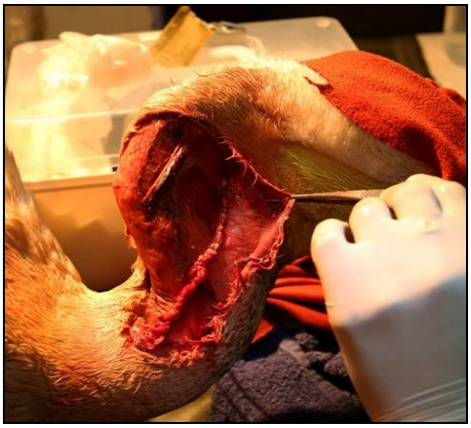

Fig 3: Esophageal tear sutured in horizontal mattress pattern with polyglycolic acid suture

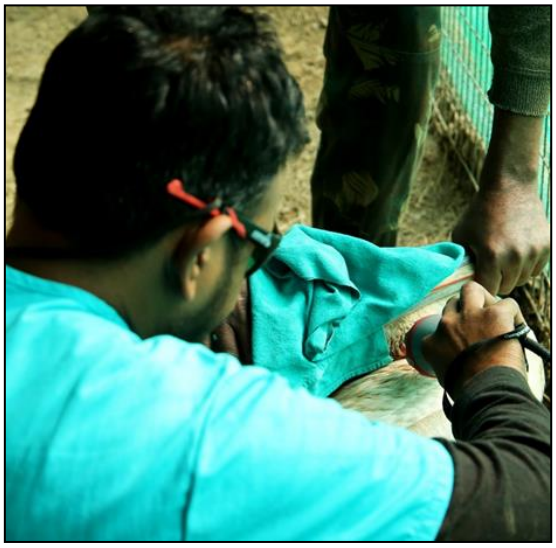

Fig 4: Therapeutic laser application to reduce inflammation and postoperative pain management

Post-operative Care and Management

The bird was kept in the observation pen to monitor bird for any sign of respiratory distress, swelling of the throat for post-operative care and management. The bird was provided with ad libitum potable water access by providing an artificial water pond in the observation pen (Fig. 5) Next day morning bird was found active and alert with normal movement in the pen without dropping the head. The bird was maintained on glucose water mixed with multivitamin supplement orally and for pain management and healing, the bird was provided with laser therapy on the surgical site (Fig. 4). for the next two days. On the third day bird seems to be more active and defensive so we decided to offer small size live fish by cutting their fins to prevent any damage to the healing wound, as the bird was with normal activities had live fish on its own without any difficulties which were monitored by a camera trap. The bird was offered with live fish @ 2 kg/day and was kept in the observation area for the next 7 days. From 7 days onwards we offered as such live fish for next 3 days. The bird was recovered uneventfully and released successfully back into the lake (Fig. 6).

Fig 5: Post-operative management; observation pen provided with water access

Fig 6: *P. onocrotalus* released back into natural habitat after uneventfully recovery

Discussion

Esophageal obstruction in seabirds is well documented (Kathryn *et al*., 2004 and B. Anjan Kumar prusty *et al*., 2020) [2, 4] but the cases of esophageal rupture are rarely reported in birds. Spontaneous rupture of the esophagus is a rare and long recognized clinical entity in birds. Ingestion of live fish resulting in airway obstruction is rare and the most fatal occasion (Ben Van Der Hoven *et al*., 2019) [3]. Laser therapy is best for the management of hemostasis in highly vascular areas. The present case is the first reported intentional ingestion of tilapia fish. The osteology and anti-predator behavior of tilapia fish had a bad choice for the drinking game. Tilapia fish have a very sharp dorsal, anal, pectoral, and caudal fin which leads to severe and deep incisions. In the present study it is clear that, after ingestion of the tilapia fish, fish went under distress and tried to come outside the pouch and ended up being stuck in the bird esophagus.

Furthermore, the case illustrates how a reckless drinking game, imitating jackass, wanda fish, and catfish can turn into a critical and dangerous medical situation with serious consequences. When confronted with an ingested fish it is important to identify the specimen for the proper line of treatment. In this case, the decision to operate the bird without intubation and general anesthesia proved to be a reasonable option and resulted in a favorable outcome for the bird.

Acknowledgement

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