

## SHORT COMMUNICATION

# Use of Modified Custom-made Mask for Induction Technique in Avian Anaesthesia

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### ABSTRACT

This study was aimed to evaluate the effects of modified custom-made masks in the induction technique of avian anesthesia. The study was conducted on 24 clinical avian cases undergoing minor or major surgical procedures. A modified custom-made face mask was found conveniently useful for induction of anesthesia in avian patients with widely diverse anatomical features. Modified custom-made mask induction was observed superior, safer, and cost-effective. It produced an effective induction procedure, minimum requirements of physical restraint, and simplified management.

**Keywords:** Avian patients, Induction technique, Modified custom made mask, Sevoflurane.

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### INTRODUCTION

Mask induction techniques are the most common anesthetic induction methods used in avian anesthesia. It has its greatest applications for birds, puppies, small size dogs, various species of rodents, and lagomorphs (Sawyer, 2007). In avian patients, anesthetic induction is commonly accomplished via mask induction rather than intravenous induction. The marked efficiency of the respiratory system coupled with a low functional residual capacity of birds allows for rapid anesthetic induction with inhalational agents (Schroeder, 2018). Sevoflurane is a safe and versatile inhalation anesthetic agent as compared with currently available other agents. Sevoflurane characteristics include inherent stability, low flammability, non-pungent odor, lack of irritation to airway passages, low blood gas solubility allowing rapid induction and emergence from anaesthesia, minimal cardio-respiratory side effects, minimal end-organ effects, minimal effect on cerebral blood flow, low reactivity with other medications, and a vapor pressure and boiling point that enables delivery using standard vaporization technique (Delgado-Herrera *et al.*, 2001). Sevoflurane is an excellent, albeit more expensive option for avian patients. The advantages of using sevoflurane versus isoflurane in birds include faster induction and recovery due to decreased blood and tissue solubility and smoother recoveries with less ataxia (Degernes, 2008). Hence, this study was aimed to evaluate the effects of modified custom-made masks in the induction technique of avian anesthesia.

### MATERIALS AND METHODS

A total of 24 avian patients of different species were presented at the Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, AAU, Anand with different types of minor or major injuries caused

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by threads (*Manja*) during kite flying during the *Uttarayan* festival. Avian patients were registered with unknown age, sex, and most of them were wild in origin. Fasting wasn't carried out, as almost all avian patients were dehydrated and in negative metabolic status. Before the surgical procedure, a pre-operative stabilization was carried out in the birds.

Different sizes of clear plastic bottles were cut in an appropriate manner and balloons were placed over the mask, with an opening in the diaphragm with a central hole cut for insertion on the patient's head. The hole was kept roughly of the same size as that of the patient's neck (Fig. 1). All the masks were ensured to fit firmly with the chosen anesthetic breathing system. In all the birds, mask induction was performed with 5 to 7% sevoflurane along with an oxygen flow rate of 0.5 to 1.5 lit/min depending on the size of avian patient and tidal volume.

### RESULTS AND DISCUSSION

Birds commonly get traumatic injuries by threads (*Manja*) during the celebration of the kite flying festival in Gujarat.



Fig. 1: Modified custom made face mask for bird's anesthesia

Avian patients enrolled in the present study had a huge variation in their body weight, ranging from 0.171 kg (Red-wattled lapwing) to 3.998 kg (Indian peacock) with a mean b.wt. of  $1.58 \pm 0.44$  kg.

Birds were captured and transported to the hospital by the volunteers, trained to handle injured birds. The pre-operative stabilization was carried out in these birds to extend their survival probabilities during anesthesia and surgical management. During pre-operative stabilization, the avian patients received at the hospital were placed in a quiet and dark environment with supplemental heat by heating pads to reduce stress and control hypothermia. Further managerial inputs included administration of dexamethasone sodium @ 0.05 to 2.0 mg/kg, IM/IV, in the critical avian patients. Enrofloxacin was also administered @ 15.0 mg/kg, IM/IV. When avian patients were found depressed and dehydrated, a lukewarm Ringer's Lactate solution was administered @ 50 to 100 ml/kg/day and 100 ml/kg/day for maintenance and rehydration, IV or intraosseous (IO), respectively. Meloxicam was administered @ 0.5 to 1 mg/kg, IM, for pain management in the non-emergency cases of the avian patient covered in the study.

The masks were suitably modified to accommodate avian species' widely diverse anatomic variations. Modified custom-made masks provided an advantage of the desired fitting in birds. Commercially available face masks may not provide fitting around the neck and are very costly. Clear plastic bottles were utilized to provide adequate monitoring and minimize the cost of anesthesia. Modified custom-made face masks produced effective induction and minimized anesthetic contamination in operation theatre (Fig. 1). Smaller

birds were induced by placing their entire head within a smaller to medium-sized modified custom-made mask. Avian patients with long beaks required modification of long plastic soda bottles.

No mortality was observed among 24 avian patients induced with the mask induction technique. The Mask induction technique was found to be successful and safe in all avian patients. The present findings of mask induction were in accordance with the observations of Sawyer (2007). Birds did not struggle during induction and no adverse reaction was elicited during intubation.

Sevoflurane is particularly suitable for avian anesthesia. Low solubility allows for faster induction and recovery and more rapid changes in depth of anesthesia. Sevoflurane is less irritating during mask induction than isoflurane (Gunkel and Lafortune, 2005). It is costly, but the benefit of not relying on organ function for excretion as elimination is predominantly by exhalation and through some hepatic metabolism (Delgado-Herrera *et al.*, 2001).

The findings concluded that the modified mask induction technique is safe, smooth, and cost-effective in birds and provides adequate monitoring and minimum chances of operation theatre contamination.

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