

Case Study

Surgical management of rectal prolapse in ostrich chicks (*Struthio camelus*)

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Abstract

Out of 300 ostrich chicks imported from South Africa, five chicks of age two months faced rectal prolapse problems at once in the Ostrich Farm Private Limited Rupandehi, Nepal. The feather around the red protruded mass was removed and the protruded mass was cleaned with normal saline. The protruded mass was pushed with gentle pressure and corrected through surgical correction. A blood sample was taken for the analysis of the Hematological profile and the fecal sample was observed under the microscope through floatation and sedimentation techniques. On the fecal examination, no parasites were found. Feed management was done for the first day and Calcium with vitamins and other minerals was given. On the next day, two birds having small protruded masses were recovered. The protruded mass of the next three chicks was restored. Local anesthesia was given with 2ml 2%xylocaine solution around the vent region. Purse string suture is done with silk thread around the anal orifice. Blood serum examination reveals that severe low level of calcium i.e. 6.7,7.1,6.5,6.8,6.9 respectively in all 5 ostrich chicks which should be in the normal range of 9-24. As per my case study, the main cause of this prolapse is the low calcium level, the low fiber in the diet and cold stress due to the winter season.

Introduction

Ostrich is truly a relic of the dinosaur age and are the only existing two-legged species from that era. Current scientific knowledge of diseases of ratite birds (ostriches, emus, and rheas) is curtailed, fragmented, and in most cases superficial or limited to anecdotal reports. The domestic ostrich (*Struthio camelus domesticus*) is the result of more than 100 years of selective breeding in the waterless regions of South Africa for superior reproductive traits (eggs produced per breeding season), feather quality, and improved docility, and is the most well-known member of this family in terms of global trade (live ostriches, fertile eggs and ostrich meat, leather and feathers). Commercial ostrich farms are largely dependent on improved health and well-organized production techniques. They are characterized by beautiful feathers and the absence of the keel of the sternum.

Ostrich (*Struthio camelus*), a member of the ratitae family, is

the largest rustic non-flying bird in the world. Highly resistant to diseases that are common in other birds and it is looked at as a 'cash cow' in South Africa and the most potential red meat-producing industry in the USA.

Since the mid-1980s, there has been worldwide interest in the farming of ostriches for feathers, meat, skin, and oil. Domestication began in the 1980s at oudtshoorn, the cape colony of South Africa. It has been bred successfully now in Canada, the United States, Australia, Spain, Italy, the U.K, etc [1].

Ostrich Nepal Pvt. Ltd, Gongolia-1, Rupandehi, is the first ostrich breeding farm in Nepal established in 2010 AD rearing around 1000 ostriches in semi-intensive practices along with about 200emus. Now there is 2300 ostrich and it spread its branch in other two areas, altogether rearing about 3400 ostrich and 3000 emus. It has started hatching both ostrich and emus.

Rectal prolapse is the protrusion of one or more layers of the rectum from the anal sphincter due to multifactorial causes like nutritional deficiencies, severe endoparasite infestation, toxins, impaction, constipation, rectal damage, estrogenic compound(phytoestrogen), cold stress or variable temperature, abnormal fermentation, low fiber diet. A complete inversion of the posterior portion of the rectum through the anus is usually characterized by the protrusion of a large cylindrical mass covered with a congested, inflamed, and often hemorrhagic mucosa(The Merck Veterinary Manual, Fourth Addition) [2]. Rectal prolapse usually occurs as a consequence of tenesmus, weakness of perirectal and perianal connective tissues or muscles, uncoordinated peristaltic contractions and inflammation or edema of rectal mucous membranes predispose patients to rectal prolapse [3]. It is liable for suffering and spontaneous deaths in ostriches, making it an important health and production issue [4].

Rectal prolapse is a common condition in ostriches associated with severe diarrhoea, impaction of the intestine, and nutritional deficiencies [5]. Particularly in emus and ostriches, the Prolapse condition has been associated with cryptosporidiosis [6,7], *Aspergillus flavus* and *Candida albicans* induced enteritis, and immunosuppression due to the quality of feed, water and hygiene [7]. The Prolapse condition in Ostrich chicks is directly related to nutritional deficiencies either in the diet of the chick, or the diet of the Breeder Birds laying the egg that the affected chick was hatched from, or from some condition that is causing the chick to be nutrient deficient (Daryl Holle, Blue Mountain Ostrich Feeds) [8]. Rectal prolapse has also been linked with impaction due to poor nutrition or eating habits of the ratites. Impaction and Rectal prolapse are one of the major problems seen in ratites, especially on the farm suffering from insufficient nutritional management in the ostrich chicks.

Materials and methods

Out of 300 ostrich chicks imported from South Africa, five chicks of age two months faced rectal prolapse problems at once in the ostrich farm private limited in Rupandehi, Nepal (Figures 1-3). The feather around the Red protruded mass was removed

and the protruded mass was cleaned with normal saline. The protruded mass was pushed with gentle pressure and the protruded mass was restored. A blood sample was taken for the analysis of the blood profile and the fecal sample was observed under the microscope through floatation and sedimentation techniques. On the fecal examination, no parasites were found. Feed formulation formula and its constituents ration were observed and found that the low quality of fiber materials (low fiber diet) and lack of sufficient maize, soya bean and grass.

Feed management was done for the first day and Calcium with vitamins and other minerals was given. on the next day, two birds having small protruded masses were recovered. The protruded mass of the next three chicks was restored. Being the Registered Veterinary Doctor of Nepal, the treatment protocol was followed in a cheap and best way without harming any chicks. Local anesthesia was given with 2 ml 2% xylocaine solution around the vent region. The protruded mass was cleaned with lukewarm normal saline as the previous day followed by dilute providine iodine solution and left for 5 minutes to shrinkage or relieve edema. Prolapse mass was gently pressed inward and a ball pen from the backside is introduced in the anal canal remaining the other half on the outside. The reason for inserting the ball pen is to act as a pipe to avoid the anal canal blockage while suturing. Purse string suture is done with silk thread around the anal orifice and the ball pen is withdrawl out leaving the canal open to defecate normally. Similarly, the other two are also done in the same way. Melone x 1 ml I/m for analgesic, anti-inflammatory, anti-exudative, and antipyretic effects. In addition, hemax ointment is applied externally, and calcium, vitamins, minerals, and OTC were given in feed. After 4 days suture material was removed.

Blood sampling and analysis

Blood was collected from the wing vein into Non-Ethylene diaminetetraacetic acid (EDTA) (non-EDTA) vials. The serum was prepared through centrifuging from the blood sample of the non-EDTA vials in the Lab of Ostrich Farm Pvt. Ltd. The sample was sent to Lumbini Zonal Hospital, Rupandehi for analysis.



Figures 1-3: Five chicks of age two month faced rectal prolapse problems at once in the ostrich farm.

Fecal analysis

The fecal sample was observed under the microscope through floatation and sedimentation techniques.

Result and discussion

There is no sign of repeated prolapse after surgical correction. Fecal examination revealed no presence of parasite and blood serum examination reveals that there is a severe low calcium level in the blood which is the main reason for the prolapse in these ostrich chicks L Table 1.

The treatment was adopted as per the research paper of srinivas, et al. [9]. on surgical management of complete colorectal prolapse in a grower emu chick (*drommaius novaehollandiae*). As per my case study, the main cause of this prolapse is the low calcium level, the low fiber in the diet, and cold stress due to the winter season [10–12].

Table 1: Five ostrich chicks of blood serum examination levels.

Parameters	Units	Ostrich no.1	Ostrich No.2	Ostrich No.3	Ostrich No.4	Ostrich No.5	Normal range
Glucose	mg/dl	174	180	166	185	179	90-230
Totalprotein	g/dl	3.61	3.45	3.62	3.91	3.82	2-5
Albumin	g/dl	1.54	1.35	1.5	1.8	1.63	1-3
Globulin	g/dl	2.05	2.06	2.11	2.03	2.09	2-4
Urea	mg/dl	14	17	13	14	15	5-13
CK	u/l	3012	4156	3345	3980	4213	3269-6145
ALP	u/l	511	434	422	453	412	115-730
AST	u/ml	71	81	75	80	73	61-80
ALT	u/ml	174	168	159	177	183	115-200
Calcium	mg/dl	6.7	7.1	6.5	6.8	6.9	9-24
Phosphorus	Mg/dl	7.1	6.8	7.8	8.4	9.5	6-18

Conclusion

Rectal prolapse can be easily prevented with a proper and balanced diet of all nutrients required by the bird including Protein, Energy, Fat, Fiber, Minerals, Trace Minerals, and Vitamins in adequate amounts. Calcium level is one of the most important elements which deficiency predisposes the chick to prolapse. Heavy parasitic infestation may also leads to prolapse. With the increase of ostrich farming around the world, more information is needed on methods to reduce ostrich chick mortality. Ostrich chicks are highly susceptible to rectal prolapse. Once it occurs then it can be managed by simple manipulation or by having a purse string suture around the vent region, If not then ultimately it is exposed to death in most cases. Out of 900 ostrich chicks about 2.7% chicks faced prolapsed problems within 3 months of age (Adhikari, B.P. 2016. Internship final report IAAS, T.U.) Low calcium levels, low fiber diet, and stress are the major cause to cause rectal prolapse in ostrich.

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