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# A case report on management of goat pox of a doe in Rangamati, Chittagong

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### Abstract

Goat pox is a contagious viral disease, which is common in small ruminants. It causes economic losses resulting from decreased milk production, damage to the quality of hides and wool, and other production. This case study enumerates the clinical signs, lab finding as well as detail diagnosis and treatment protocol. A one year five months old Jamnapari doe, weighing 12 kg brought to the Upazilla Veterinary Hospital, Rangamati with a history of high fever, loss of appetite and dullness. On the basis of clinical signs followed by lab diagnosis and blood parameters, the case was diagnosed as goat pox. The condition of the goat was gradually improved and finally cured after two weeks of antibiotic treatment.

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**Keywords:** Contagious viral disease, Rangamati, Goat pox

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### 1. Introduction

Goat and sheep pox viruses of small ruminants belong to family Poxviridae, subfamily Chordopoxvirinae, and genus Capripoxvirus (Buller et al., 2005). The viruses are broad (170-260 nm by 300-450 nm), enveloped and ds- DNA viruses (Tulman et al., 2002). Sheep pox virus (SPV) pre-eminently causes illness in sheep and goat pox virus (GPV) mainly affects goats (Singh et al., 1979). Sheep pox virus and goat pox virus be unable to differentiate from each other with serological techniques and were once thought to be strains of a single virus (Kitching et al., 1986). Genetic sequencing has currently revealed that these viruses are distinct; nevertheless recombination can ensue between them. Intermediate host specificity normally found in recombinant strains. Sheep pox virus and goat pox virus are nearly related to the virus that causes lumpy skin

disease in cattle (LSDV). The relationships between these three capripoxviruses are still being established, but one recent analysis suggests that GPV and LSDV are more closely related to each other than SPV is to LSDV. Sheep and goat capripoxviruses cause disease only in these two species. Many SPV isolates are specific for sheep, and many GPV strains are specific for goats, but some strains of these viruses readily affect both species (Sarkar et al., 1980). Infections have not been reported in wild ungulates. Sheep pox and goat pox are found in parts of Africa and Asia, the Middle East, and most of the Indian subcontinent. Rangamati is the hilly area of Bangladesh under Chittagong division. A large number of goats are reared by local people. In every year goat pox is encountered in this area. The outbreak is mainly seen in late winter and autumn (From October to April). Usually severe economic losses occur. SPV and GPV are often transmitted by the respiratory route during close contact, but they may also enter the body through other mucous membranes or abraded the skin. These viruses can be found in saliva, nasal and conjunctival secretions, milk, urine, and feces, as well as in skin lesions and their scabs (Bhanuprakash et al., 2003). Ulcers on the mucous membranes are important sources of virus. Whether SPV and GVP can be transmitted in semen or embryos has not been established. Animals are most contagious before neutralizing antibodies develop, which occurs approximately a week after the onset of clinical signs (Suhaci et al., 1939). Experimentally infected sheep and goats can shed poxviruses in nasal, conjunctival and oral secretions for 1 to 2 months, but shedding peaks during the second week after inoculation, then declines rapidly. Chronically infected carriers are not seen. SPV and GPV can also be spread on fomites or transmitted mechanically by insects such as stable flies (*Stomoxys calcitrans*), although the latter route may be uncommon. These viruses can remain infectious for up to six months in shaded sheep pens. They may also be found on the wool or hair for as long as three months after infection, and possibly longer in scabs. Whether the viruses in scabs are infectious is unknown; these viruses are complexed with antibodies and can be difficult to recover on tissue culture media (Murray et al., 1973). The incubation period varies from four to 21 days, but it is usually 1 to 2 weeks. Clinical signs generally appear sooner when the virus is inoculated by insects than when it is transmitted in aerosols. After experimental inoculation into the dermis, primary lesions can develop at the site within 2 to 4 days. The agents of sheep and goat pox could be used in agroterrorism, and are listed in the USDA National Select Agent Registry (Rao et al., 2000). In Bangladesh, there are a few number of studies have found in literature about sheep and goat pox. Therefore, the present study was aimed to diagnose, treat and management of cutaneous goat pox in a doe.

equencing has now demonstrated that these viruses are distinct, but recombination can occur between them. Recombinant strains usually have intermediate host specificity. SPV and GPV are closely related to the virus that causes lumpy skin disease in cattle (LSDV). The relationships between these three capripoxviruses are still being established,

## **2. Case Presentation**

### *2.1. Case History*

A one-year-five-months old Jamnapari doe weight of 12 kg was brought by farm owner to the Upazilla Veterinary Hospital, Rangamati located in hilly area of Chittagong division. This case was confirmed as a goat pox on the basis of clinical history, clinical signs and laboratory diagnosis.

### *2.2. Clinical signs*

At the first day of my observation, there was high temperature (106°F), loss of appetite, rough hair coat, and pock lesion in head and teat region, emaciation, and erosion on the tongue. Next day same lesions were noted. These lesions were progressively raised and slightly blanched that presents erythema with edema in the

central part of the lesion (papule). After five days of my study, the pock lesions were observed on the mouth, fore limb, and hind limb. The center of the lesion then became depressed and gray (necrotic) and was surrounded by an area of hyperemia. Surprisingly, on the tenth day of study, the lesions were clearly visible in eye and nose. The lesions were found with transudate representing the vesicular stage of the pox, however, gross vesicle on the skin was rare. After the fifteenth days of study, a lesion was ruptured on the leg which was confused with dog bite by the owner. On the twentieth day, the scar forming lesion was begun to start.

### 2.3. Sample collection:

For confirmatory diagnosis, we had collected skin scrapping from affected area at 20th day that contains papules. And the sample was preserved in viral transport media (Stuart transport media). Meanwhile, blood sample was drawn from jugular vein at 1st day and 7th day for comparing blood parameter. It was sent to Dept. of Microbiology & Public Health lab, CVASU by following appropriate procedure.

### 2.4. Lab diagnosis:

**Blood:** Collected blood samples were tested in Dept. of Physiology, Biochemistry and Pharmacology lab, CVASU.

**Egg inoculation:** After preparing viral inoculum, it was inoculated in CAM (Chorio allantoic membrane) route at 9 days embryonated egg.

### 2.5. Treatment:

For checking secondary bacterial infection the goat was treated with antibiotic (Combipen®), antihistaminic (Histavet®), antiinflammatory (Fevasol®) for 7 days as there was no drug for viral diseases. And the animal was washed with antiseptic (Povisep®) at alternative days.

## 3. Results

### 3.1. Egg inoculation:

After 5 days of inoculation the embryo was found dead and characteristics pock lesion was noted in the embryo. That indicated that it was goat pox.



**Fig 1.** Broken embryo after days of inoculation



**Fig 2.** Pock lesion in Chicken Embryo

### 3.2. Blood parameter:

In blood parameter there was a significant change in eosinophils, on the 1st day it was so high about 16% but

after 7 days it was 4% came to normal (1-8%) level. Neutrophil was gone low at 1st day but became higher at 7th day and lymphocyte was remained normal.

**Table 1:** Blood parameter of goat at 1<sup>st</sup> and 7<sup>th</sup> day

Name of the test	1 <sup>st</sup> day	7 <sup>th</sup> day	Normal range
Hemoglobin	5	6.6	8-12gm %
ESR	1	0	
Total count of RBC	8.29	8.39	8-18million/cumm
Total count of WBC	5.55	9.29	8-12(Thousand/cumm)
PCV	24	28	50-70%
Lymphocyte	75	33	50-75%
Neutrophils	15	59	30-48%
Eosinophils	16	4	1-8%
Monocytes	2	4	0-4%
Basophils	2	0	0-1%

### 3.3. Condition of animal:

After 7 days of treatment, the goat was gradually improved and finally cured after one month. But it left scar lesion in goat body.

### 3.4. Complication:

No complication has occurred in this case.

## 4. Discussion

In this study, outbreak of goat pox was seen in February to April which is similar to previous studies. In previous studies it found in November to May but peak outbreak occurred during March (Bhanuprakash et al., 2005; Yeruham et al., 2007; Zangana et al., 2013). The clinical sign and lesion observed in this case are agreement with the study of (Nasroallah Moradi kor et al., 2012) and (Kamran Mirzaie et al., 2015).

In present studies, field strain was inoculated in Chorioallantoic Membrane (CAM) route. The sample produced characteristics 'Pock' lesion on 14 days old embryo. At preliminary passage, the Chorioallantoic Membrane (CAM) became opaque, edematous and dense. In previous studies, similar type's character was found. Sphere shape, opaque raised area of 3-5 mm in diameter was manifested in three successive passages (Gilhare Varsha Rani et al., 2014). But in this study, only single time the sample was inoculated in CAM routes. Further inoculation can help more for confirmatory diagnosis. In blood examination, there was found increased eosinophils (16%) but lymphocyte percentage was normal. We thought that there was a concurrent parasitic infection but unable to find it. We also collected blood from the animal before vaccination and after vaccination to see the change of the antibody level. But due to inadequate lab facilities, we did not perform this. Pox viruses can produce both cellular and humoral immunity. Sheep and goat which are recovered from SGP infection contained immunity for lifelong (Kitching, 2004; Panchanathan, 2008; Sadri et al., 2010;

Bhanuprakash, 2011). Penicillin along with other drugs was used to treat goat pox in this study. These findings are supported by the findings of (Kamran Mirzaie et al., 2015). Penicillin was used to prevent secondary bacterial infection. Antihistaminic was used to prevent the adverse effect of antibiotic and allergic reaction. Metamizole was used to reduce body temperature. Antiseptic was used to wash the affected area regularly (Blackwell, 1998).

## 5. Conclusions

The effective control measures may simplify by live attenuated vaccines and noble diagnostic tests. By active surveillance particularly for the detecting viruses control programs should be monitored, as serological tests unable to differentiate between infection and vaccination. Socio-economic and political fixity, availability of veterinary services, and bountiful infrastructure and logistic back ups are exigent for accomplishing feasible control programs. Insufficient infrastructure is one of the key components which contest with fruitful implementation of forming herd immunity.

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## Conflicts of interest

The authors declare no conflicts of interest.

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