

**EPIDEMIOLOGICAL AND PATHOLOGICAL ASPECTS OF HORN CANCER IN CATTLE OF GUJARAT**

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**ABSTRACT**

The present study was carried out to know prevalence, and the gross and histopathological lesions of bovine horn cancer in *Bos indicus* in Gujarat. The material was collected from college hospital, Clinics and Dept. of Surgery at Anand as well as by personal visits to other areas of Gujarat. Prevalence of occurrence of horn cancer was observed more in males (15/18) than females (3/18). The risk of this condition was found between the age group of 5 to 6 years (11.11%), 7-10 years (72.22%) and 10 to 12 years (16.66%). Prevalence of horn cancer was observed more in Kankrej breed (16/18) than Gir breed (2/18) of cattle. The most consistent clinical signs observed were frequent shaking of head, tilting of head at the affected side, bending of affected horn and increase nasal discharge from the nose of affected side in advance cases. Microscopic examination of cancerous tissue collected from middle region of horn core in all the three stages of horn cancer revealed typical keratinizing squamous cell carcinoma with characteristic epithelial pearls. The cell mass consisted of concentric layer of squamous cells showing gradually increasing keratinization towards the center.

**KEY WORDS:** Gujarat, Zebu cattle, Horn cancer, Histopathology

**INTRODUCTION**

Neoplasm is considered as one of the major concerns to the bovine population as is to the human life, as it causes extensive economic loss by virtue of its wide spread prevalence and the adverse effect on general health and productivity of the animal. Amongst the tumours of cattle, horn cancer is considered to be most common in India and has attracted great attention of both farmers and scientists. This tumour occurs almost exclusively in India, where it affects approximately 1% of the cattle population (Naik *et al.*, 1969).

**MATERIALS AND METHODS**

The material for the study of bovine horn cancer was obtained from college hospital, clinics and Dept. of Surgery at Veterinary College, Anand as well as by personal visits at Panjarapoles of Rapar and Bharuch and Veterinary Division of Amul Dairy. A total of 18 spontaneously occurring bovine horn cancer were made available during the period from January to December, 2006 and tumor tissues were collected along with detailed history and gross observations of each individual case. The samples were collected in 10% neutral buffered formalin for histopathological examination.

The tumor tissues fixed in 10 % neutral buffered formalin were processed by paraffin wax embedding method of tissue sectioning. 6 to 7 micron thick Sections were cut and stained with haematoxyline and eosin (Luna, 1968), and viewed under microscope for histopathological diagnosis of tumor.

**RESULTS AND DISCUSSION****Breed and sex wise prevalence**

The breed and sex wise prevalence of horn cancer in randomly selected 18 cases under study showed the prevalence of occurrence of horn cancer was highest in Kankrej (16/18, 88.88%) followed by Gir (2/18, 11.11%) breed of cattle. Incidence of the horn cancer was higher in bullocks (15/18, 83.33%) as compared to cows (3/18, 16.66%). Not a single case was recorded in bulls during the present period of study. The observations were in close agreement with those made by earlier workers ( Naik and Randelia, 1978; Joshi, 1983 and Prajapati, 1984).

As observed in the present study and also reported by the earlier workers, the high incidence of horn cancer in Kankrej breed of cattle appears to be of genetic predisposition of this breed. Big and massive horns might also contribute to this factor. Horns in Gir cattle are smaller and lighter in weight. Again the prevalence was very high in bullocks and low in cows. This probably indicated the role of stress in the causation of this condition. Bullocks are exposed to more stress than cows and bulls. They are used for ploughing, transport and are made to work under scorching heat of the sun. The horns of the bullocks are pared for beautification. This paring causes thinning of the cornified layer of the horn and are continuously exposed to hot sun. The actinic rays appear to cause continuous irritation on the inner epithelial lining of the core of horn and may result into cancerous growth. Gupta and Sandana (1981) suggested chronic irritation, actinic sun rays, hormonal imbalance, viruses etc. as the possible major factors associated with causation of horn cancer.

### **Age wise prevalence**

In present study all the cases of horn cancer were recorded from 5 to 12 years of age. Not a single case was reported below 5 years of age. The frequency of occurrence of horn cancer was highest in the age group of 7 to 10 years (72.22%) followed by 10 to 12 (16.66%) and 5 to 6 years (11.11%) of age. Naik et al. (1969) reported 70-80% of the horn cancer cases in the age group of 8 to 10 years. Kaul and Kalra (1973) reported more than 90% of the affected animals in the age group of 5 to 10 years. They did not notice this condition in animals below four years of age. The high incidence of horn cancer during 7 to 12 years of age suggested that the disease occurs in the adult stage during their prime working age indicating a long incubation period.

### **Gross Lesions**

Gross pathological lesions of cancerous growth were recorded after surgical amputation of horn. In cases where affected horns found already detached, the growth at the base was observed. The stage-wise lesions were as under.

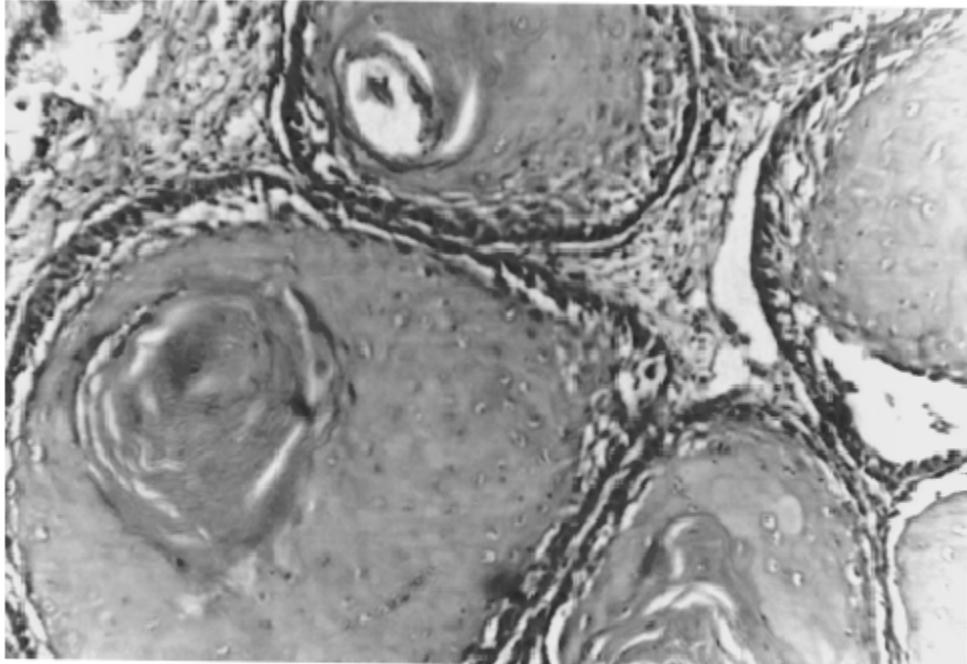
The animals affected with first stage of horn cancer revealed tilting of affected horn and there were no gross lesions at the base of horn. The cancerous growth in the initial stage of the disease started from the middle and/or distal region of the horn core, which subsequently filled the entire horn core and progressed towards the base and frontal sinus.

In the second stage of horn cancer, nearly entire horn core was found filled with the cancerous growth. Cancerous tissue in the middle region of the horn core was dry, hard and dirty grey in colour. Cancerous growth at the basal region revealed two types of changes. Towards the middle region, the tissue was moist, soft, highly vascularised and reddish grey in colour. The other type of tissue projecting towards the base comprised of round to ovoid myxomatous bodies.

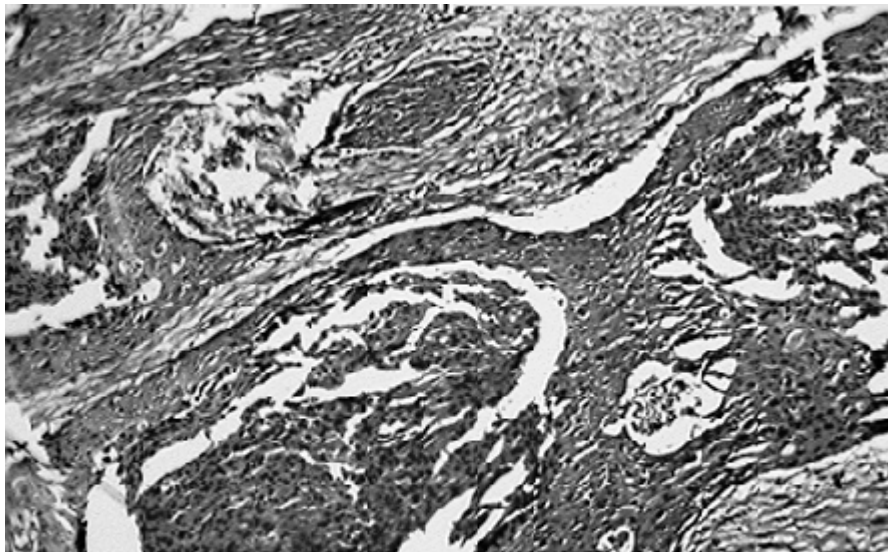
In the third stage, the base of affected horn was completely filled with cauliflower like cancerous growth. The cancerous tissue was dry, granular and dirty yellow in colour. Cancerous tissues towards the middle region of affected horn showed foul smelling turbid fluid.

### **Histopathological Studies**

Microscopic examination of cancerous tissues revealed typical squamous cell carcinoma with keratinization in all the cases studied irrespective of stage of the horn cancer (plates 1 and 2). These findings were in agreement with these of Naik and Randelia (1978), Gupta et al. (1980), Joshi (1983), Prajapati, (1984) and Shukla, (1990). Clinical stages were mainly due to progressive nature of the disease, extent of growth in horn core and frontal sinus and metastasis in regional lymph nodes. Tumor tissues collected from the middle region of horn core in all the three stages of horn cancer revealed typical keratinizing squamous cell carcinoma with characteristic epithelial pearls. Mitotic figure were frequently seen in this area. The cell mass consisted of concentric layers of squamous cells showing gradually increasing keratinization towards the center.



**Plate 1** Section of horn cancer tissue showing typical keratinizing squamous cell carcinoma. Note, concentrically arranged keratin pearl in centre



**Plate 2** Section of horn cancer tissue showing concentric layers of squamous cells with keratinization

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