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Role of vincristine sulphate along with anthiomaline for treatment of oral tumours in bovine

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Abstract

The present study was carried out on eight cattle and buffaloes had tumorous growth of different origin in oral cavity. Osteolysis, teeth displacement, calcification and soft tissue changes were found in radiographic examination. Histopathological examination revealed that all oral tumours were benign in nature. Vincristine sulphate @ 0.75mg/m² body surface area intravenously at weekly interval for 4 to 6 times and anthiomaline @ 15-20 ml total dose by deep intramuscular injection six times on alternate days were administered. Out of eight animals, three animals showed recovery, four animal's showed no or partial recovery while one animal died during the course of chemotherapeutic treatment. Inappetence to anorexia condition was common in all the animals. Results showed that vincristine sulphate with anthiomaline may give promising result in small size tumorous growth but large tumorous growth should be debulked by surgery before chemotherapy.

Keywords: Bovine oral tumour, vincristine sulphate, anthiomaline and ameloblastoma

Introduction

Incidence of tumours in bovine has relatively increased and occupied second place after canine tumours [1]. Tumours of odontogenic origin are common in cattle [2] and are mainly found at mandibular incisor region and it has been associated with the development of permanent incisor teeth [3]. Oral tumours in cattle and buffaloes are benign in nature and fibroma is the most common tumour in oral cavity [4]. Monotherapy with vincristine sulphate is considered to be effective for tumours, but treatment time until complete clinical remission may vary [5]. Vincristine sulphate is safe for most patients, but potential side effects can occur as gastrointestinal alterations, myelosuppression and extravasation injury [6]. Autohaemotherapy was found to be most effective with a cure rate 92% followed by anthiomaline (81%), oral administration of thuja extract (70%) and topical application of thuja ointment (57%) for papillomatosis in jersey cows [7]. Chemotherapeutic drugs were effective as a sole treatment for small size of tumour, but it was recommended that larger growths should be surgically debulked prior to chemotherapeutic treatment [8]. Vincristine sulphate in combination with anthiomaline gave better result in verrucous, nodular and occult type of sarcoids in equine [9]. Vincristine sulphate alone as a chemotherapeutic agent may give promising result in small size oral tumorous growth in bovine [4]. Hence the present study was designed to observe the efficacy of vincristine sulphate along with anthiomaline for oral tumours in bovine.

Materials and Methods

The present study was conducted on eight cattle and buffaloes had tumours of different origin in oral cavity presented to Veterinary Clinical Complex, LUVAS, Hisar. For radiological examination large animal X-ray machine having maximum mA of 600 and KVP of 150 was used. Radiographic examination was done to see the invasiveness of tumours, osteolytic changes, teeth displacement, calcification or any other changes. Vincristine sulphate (1mg/ml) (Cytocristin® Aqueous, Cipla) at the dose rate of 0.75mg/m² body surface area intravenously at weekly intervals for 4 to 6 times and anthiomaline (Lithium Antimony Thiomalate, Novartis pharmaceuticals) at the dose rate of 15-20 ml deep intramuscular injection on alternate days for six times was administered. Supportive therapy was also included with administration of liver tonics, vitamin C and B-complex at routine doses. The representative tissue samples from tumorous growths were collected in 10% buffered formalin. After proper fixation the samples were subjected to routine histopathological examination [10].

The cases were followed during the entire course of the treatment and it was observed whether cases respond completely or not.

Results

The details regarding age, sex, site of tumour and histopathological findings of the animals are described in Table 1. The age of the affected animals varied between two to twelve years. The most common affected age group was 4-8 years and mandibular region was the most common site (Fig. 1). All the affected animals were female except two male. All tumours were hard in consistency except two, pinkish white in colour, 4 to 20 cm in size and irregular round to oval in shape. Radiographic examination revealed osteolytic changes, tooth displacement, calcification in three tumorous growths respectively and soft tissue swelling in all

tumorous growth. In one case there was a cyst below the first molar tooth and in other case there was fracture of incisor tooth with dispersal in the tumours growth (Fig. 2).



Fig 1 (A-B): Gross picture of tumorous growth in oral cavity of buffalo



Fig. 2: Radiograph (lateral view) showing fractured tooth and osteolytic changes in oral tumorous growth at rostral mandible region

Table 1: Description of cases of bovine oral tumours

Sr. No.	Animal species	Age (Years)	Sex	Site of growth	Diagnosis based on histopathological finding
1	Buffalo	6	F	Rostral mandible	Ameloblastoma
2	Buffalo	2.5	F	Left cheek	Fibroma
3	Bullock	12	M	Right mandibular gingiva	Fibroma
4	Buffalo	7	F	Rostral mandible	Ameloblastoma
5	Bullock	2	M	Rostral mandible	Myxoma
6	Buffalo	8	F	Left mandibular gingiva	Chondromyxoma
7	Buffalo	4	F	Left mandibular gingiva	Ameloblastoma
8	Buffalo	8	F	Left maxillary gingiva	Fibromatous epulis with adenoma

Histopathological examination revealed that fibroma, ameloblastoma and myxoma are the most common tumours in bovine oral cavity.

Ameloblastoma

Microscopically, ameloblastoma revealed islands of odontogenic epithelium surrounded by a fibrous connective tissue stroma. Neoplastic cells were lined up in a palisade

fashion while inside cells were arranged in different directions. Tumour cells were columnar in shape having elongated hyperchromatic nuclei with indistinct cytoplasmic outlines (Fig. 3).

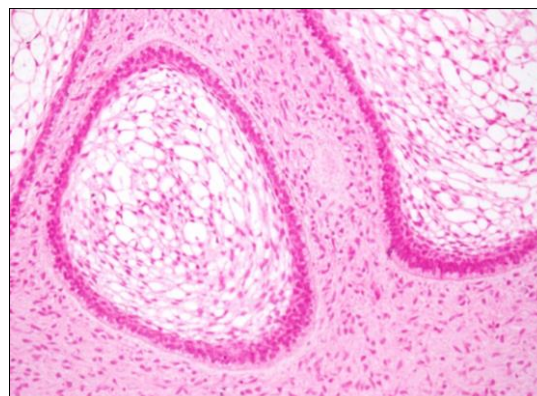


Fig. 3: Oral cavity tumour growth showing peripheral layer of columnar cell with elongated nuclei enclosing multiple cells resembling stellate reticulum of the enamel organ characteristics of ameloblastoma (H&E 200X)

Fibroma

Microscopically, fibroma was characterized by interlacing bundles of fibrocytes accompanied with collagen fibres. At places fibres were arranged in whorl like structures. Neoplastic cells were spindle shaped with ovoid to elongated nuclei (Fig. 4).

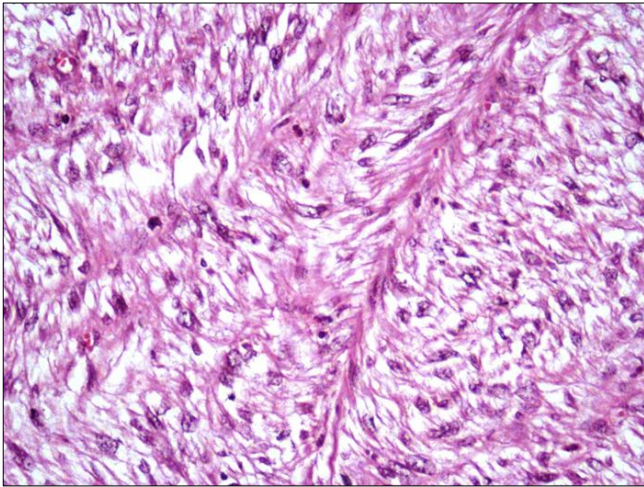


Fig 4: Oral cavity tumour growth showing whorls and interlacing bundles of fibroblasts and collagen fibres characteristics of fibroma (H&E 400X)

Myxoma

Microscopically, the tumour section was poorly cellular and had abundant light blue stained amorphous ground substance. Neoplastic cells were either large stellate triangular or rounded fibroblasts with prominent vesicular nuclei and small nucleoli. These cells were characterized by presence of prominent cytoplasmic processes forming a meshwork.

Fibromatous epulis with adenoma

Microscopically, fibromatous epulis with adenoma was characterized by presence of small stellate to spindle fibroblasts regularly arranged in a dense fibrillar collagenous background with pleomorphic irregular lobules and cords of large, polyhedral cells surrounded by small, dark staining reserve cells. Epithelial remnants of dental laminae and fibroblastic stroma was characteristic of fibromatous epulis (Fig. 5).

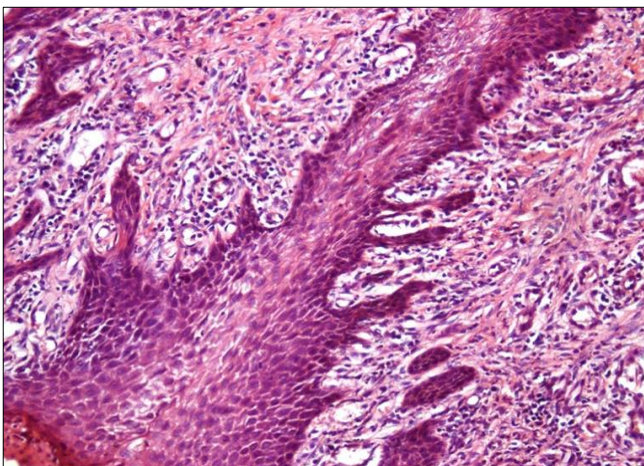


Fig 5: Oral cavity tumour growth showing epithelial remnants of dental laminae and fibroblastic stroma characteristic of fibromatousepulis (H&E 200X)

Chondromyxoma

Microscopically, lobules of hyaline cartilage surrounded by chondroblasts arranged in singly lacune and stellate cells dispersed in abundant mucoid ground substance characteristics of chondromyxoma (Fig. 6).

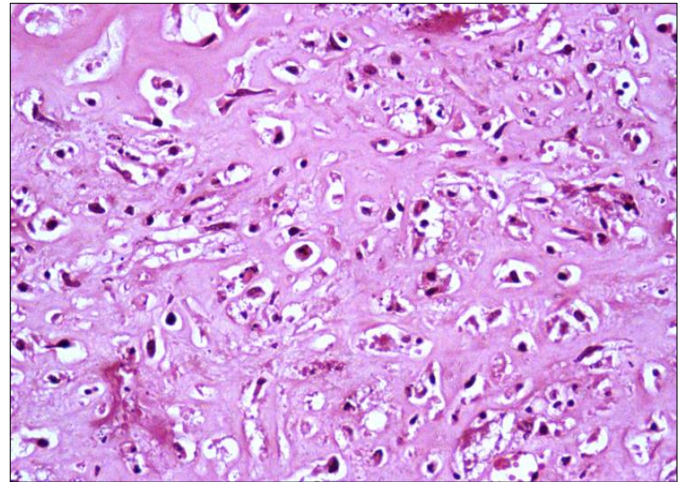


Fig 6: Oral cavity tumour growth showing lobules of hyaline cartilage surrounded by chondroblasts arranged in singly lacune and stellate cells dispersed in abundant mucoid ground substance characteristics of chondromyxoma (H&E 400X)

Therapeutic efficacy

Animals were treated by administering vincristine sulphate (1mg/ml) (Cytocristin® Aqueous, Cipla) at the dose rate of 0.75mg/m² body surface area intravenously at weekly intervals for 4 to 6 times and anthiomaline (Lithium Antimony Thiomalate, Novartis pharmaceuticals) at the dose rate of 15-20 ml deep intramuscular injection on alternate days for six times. Out of eight animals, three animals recovered completely and four animals shown no or partial recovery while one case died during the course of treatment. Death occurred mainly because of anorexia. Inappetance to anorexia condition was seen in all the animals. Three animals who recovered had tumours of small size with soft consistency.

Discussion

In the present study mandible was the most common site for oral tumour in bovine. Oral tumour may occupy a position anywhere in mandible or maxilla but mostly involves lower jaw [11]. Odontogenic tumour occurs predominantly in the mandibular incisor region of bovine [12]. Radiographic examination revealed tooth displacement, osteolytic changes and calcification in 38% oral tumourous growth. Displacement of neighbouring teeth due to tumour expansion is much more common than root resorptions in oral tumours [13]. Tooth displacement, osteolytic changes and calcification are common findings for oral tumourous growth in bovine [4]. Fibroma and ameloblastoma was the most common tumour observed in oral cavity of bovine. Fibroma followed by ameloblastoma was the most common tumour of the oral cavity of bovine in a retrospective study of bovine tumours in between 2004-14 in Haryana state [14]. In the present study small size tumourous growths respond to chemotherapeutic treatment. Intralesional vincristine and prednisalone injections were found effective for the treatment of squamous cell carcinoma in a puma [15]. Chemotherapy drugs can be administered as a sole treatment to small size of tumour, but it

is recommended that larger lesions should be surgically debulked prior to drug treatment^[8]. Vincristine sulphate alone as a chemotherapeutic agent may give promising result in small size tumorous growth but for large tumorous growth surgical intervention is required^[4].

The present study concluded that most of the oral tumours in cattle and buffaloes are benign in nature. Vincristine sulphate along with anthiomaline as a chemotherapeutic agent may give promising result in small size oral tumorous growth in bovine but large tumorous growth must be surgically removed before chemotherapy.

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