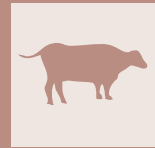


A study on the surgical management of benign oral tumours (odontomas) in buffaloes: a series of eight cases



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SUMMARY

Odontomas are commonly seen in buffaloes as compared to cattle and, particularly involve the lower mandibular incisors. This study focuses on eight cases of oral tumours in female buffaloes, documenting their clinical presentation, diagnostic approach, surgical management and follow up. The buffaloes were aged between 3 to 10 years and were presented with outgrowth on lower jaw from 1 month to 2 years. Clinical examination and radiography revealed involvement of anterior mandible, often with calcification. Histopathological analysis was done in 3 buffaloes, which reported; chronic active inflammation, myxoma, and fibroma durum.

The odontoma's were surgically resected using a wire saw or surgical blade under sedation (Xylazine or midazolam) and mental nerve block in 6 buffaloes. Silk sutures were applied for mucosal apposition and to stop bleeding followed by bandaging. Post-operative care included antibiotics and anti-inflammatory medication. Post-operative follow up at 15 days revealed the wound to be healed without complication in all the buffaloes. On long term follow up, only one buffalo showed mild re-occurrence at 4 month (16.67%) and one had mild brachygnathism visible.

The study recommends surgical resection of odontoma in buffaloes for a favourable outcome. Mucosal closure of wound with sutures helps in healing.

KEY WORDS

Buffalo; myxoma; odontoma; oral tumour; surgery.

INTRODUCTION

Odontomas are common dental tumour in bovine involving mandibular incisors. It is reported to be composed of degenerative epithelium of enamel with fluid and encapsulating fibrous tissue (1). Odontomas can vary in size and shape, from incidental to massive masses that interfere with prehension, potentially affecting the health of animal.

Odontomas have been reported in cattle, horse, dog and cat; with most frequently in cattle (2). Odontoma can be of four types; ameloblastic fibroma, complex odontoma, compound odontoma and ameloblastic fibro-odontoma (3). The extraosseous odontoma are those which occur in the soft tissue covering the tooth bearing portion of the jaws and intraosseous occur inside the bone and may erupt (erupted odontomas) into the oral cavity. The complex odontoma form an amorphous calcified mass in the region while the compound odontomas forms multiple small tooth-like structures (3). The odontoma in buffaloes always involve the incisors and though the incisors are not used as prehensile organ but they do make it difficult for the tongue to lift fodder and in the process, it gets

ulcerated on the ground or manger. So, the removal of odontomas in buffaloes is important.

This study discusses the diagnosis, surgical management, and the outcomes of odontoma cases presented in buffaloes, focusing on the practical aspects of treatment and long-term follow-up.

MATERIALS AND METHODS

The study included 8 cases of odontoma presented in buffaloes during a period of one year at a teaching hospital. The detailed signalment, history and clinical presentation of all the buffaloes were recorded. The radiographic and histopathological evaluation of the growths were performed. All the odontomas were surgically resected under sedation and nerve block anaesthesia. The buffaloes were followed for outcome through telephone and social media.

RESULTS

Case presentation

The details of the cases are tabulated in Table 1. All the buffaloes presented were adult with 2 heifers. Out of 8, 4 buffaloes were of Murrah breed (50%), 3 were Nili Ravi (37.5%) and one was local non-descript. The 50% of the buffaloes were in the sec-

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Figure 1 - Series of photographs showing the clinical presentation of buffaloes with odontoma.

ond trimester of pregnancy and which was the reason that owner of 2 buffaloes did not give consent for surgical intervention. The odontomas were chronic (30-365 days old) and were rubbing against the manger leading to ulcerations with occasional bleeding and difficulty in prehension of feed. The left side of the incisors were more involved than the right (62.5%).

Radiographic Findings

The lateral radiographs were done in all the buffaloes. The 2 buffaloes showed cystic opacities (Figure 2a and 2e). The growth

seem to be having a calcified margins as an extension from mandible in 6 buffaloes (75%). All the buffaloes except one (87.5%) showed mild to moderate calcified area in the growth, which was usually away from the incisors and mandible. The incisors were seen mal-aligned in 4 buffaloes (50%). No apparent bony or cystic abnormality was seen in one buffalo (Figure 2c).

Histopathology Findings

Histopathology was done in 3 of the 6 buffaloes operated (50%).

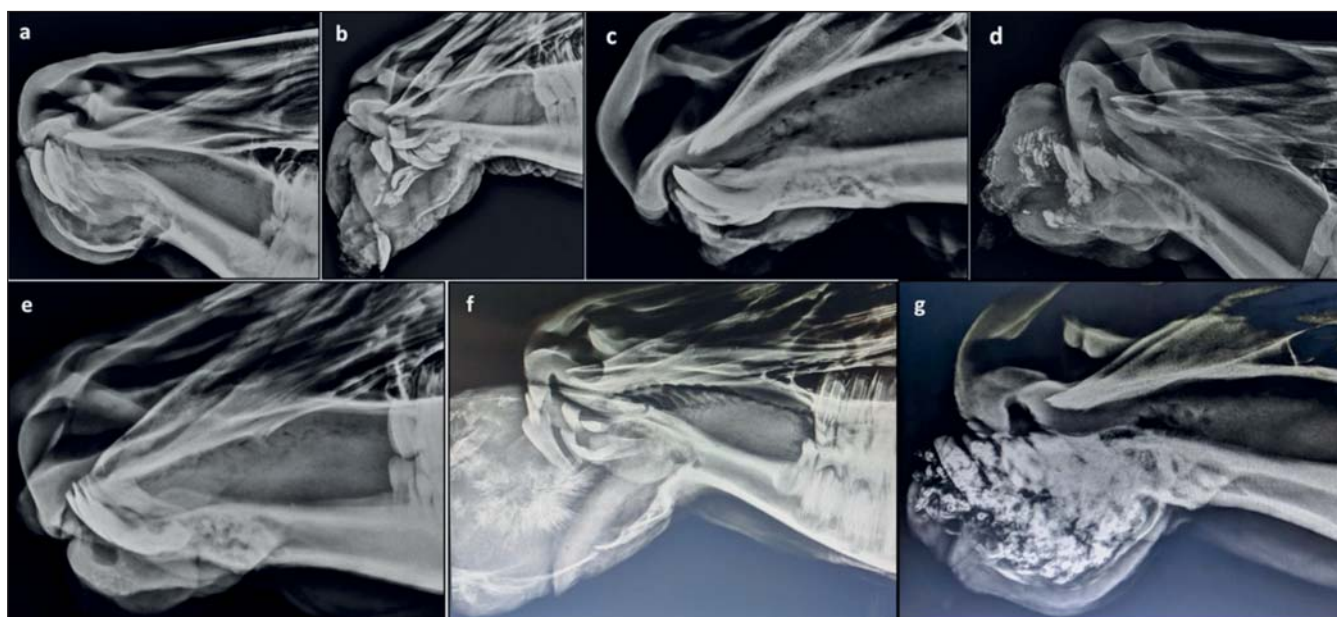


Figure 2 - Radiographs of the buffaloes presented with odontoma in lateral view. Radiographs showing cystic opacity with calcified margins (a), dislodged incisors with diffuse calcification and partially encapsulated calcified margins (b), no calcified area of incisor involvement seen (c), mildly mal-aligned incisors with diffuse calcified areas (d), Mild calcification seen cranial to incisors (e), mal-aligned incisors with sunburst calcification seen in the middle of the growth and calcified margins (f), Diffuse calcification seen cranial to incisors with suspected mal-aligned incisors (g).

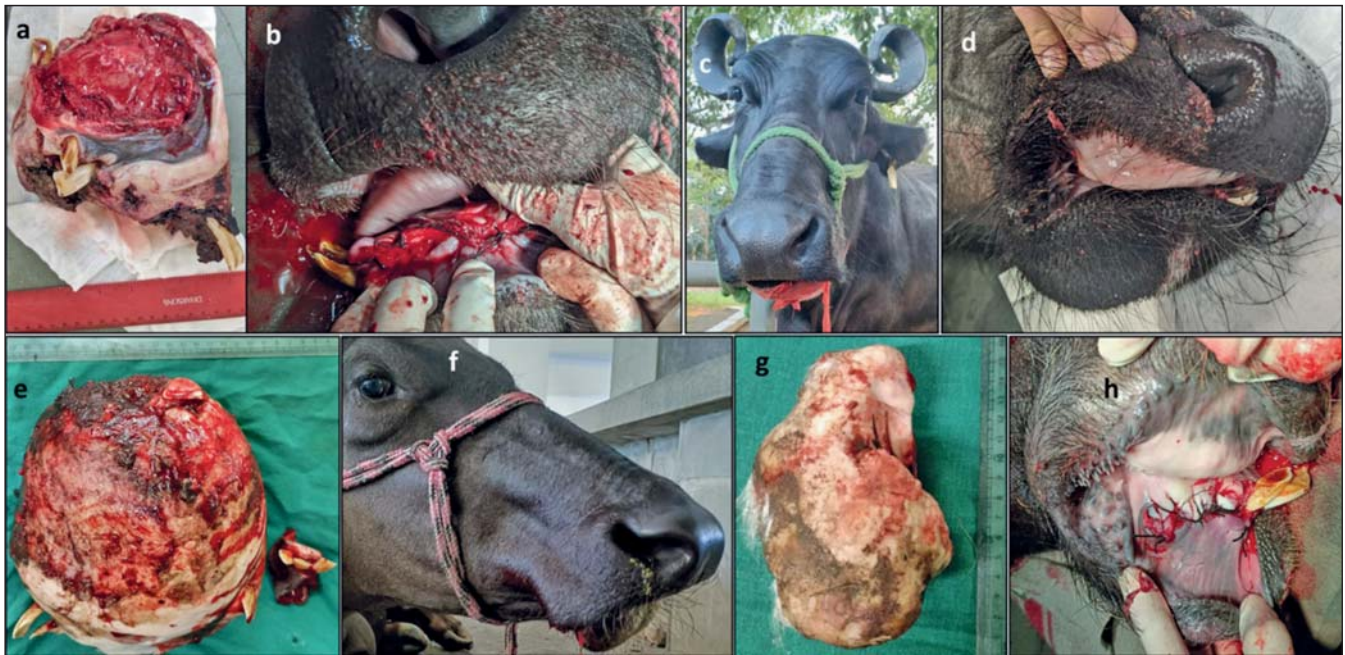


Figure 3 - Series of photographs showing the surgical findings in various cases of odontoma in Buffaloes. The resected odontoma (a, e, g) with measuring scale, the resected odontoma after placement of silk sutures (b, h), the buffalo with bandaging after resection of odontoma (c) and the immediate post-operative look of the buffalo after surgery and suturing (d and f).

Table 1 - Table showing the signalment, clinical presentation, radiography, histological and surgical findings and outcome of buffaloes with odontomas.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Age (Years)	3.5	7	10	9	7	3	5	8
Breed	Murrah	Local	Murrah	Nili Ravi	Nili Ravi	Murrah	Murrah	Nili Ravi
Gender	Female	Female	Female	Female	Female	Female	Female	Female
Body weight	400	450	550	520	500	390	460	550
Pregnancy status	Non-pregnant	Non-pregnant	Non-pregnant	Non-pregnant	6 month	5 months	5 months	5 months
Age of odontoma (days)	90	30	135	30	365	60	60	20
Clinical presentation	Encapsulated growth. (Figure 1a)	Ulcerated growth with broken incisors. (Figure 1b)	Ulcerated growth. (Figure 1c)	Encapsulated growth (Figure 1d)	Encapsulated growth. (Figure 1e)	Encapsulated growth. (Figure 1f)	Encapsulated, ulcerated growth (Figure 1g)	Encapsulated growth (Figure 1h)
Side affected	Left	Left	Left	Right	Left	Left	Right	Right
Primary complaint	Growth	Difficulty in prehension, bleeding	Occasional bleeding.	Prehensile difficulty, bleeding.	Mild prehensile difficulty	Difficult prehension	Prehensile difficulty	Mild prehensile difficulty
Radiography (Lateral view)	Cystic opacity underneath incisors with calcified margins. (Figure 2a)	Multiple broken and displaced incisors seen with mild calcified area. (Figure 2b)	No bone or incisor involvement seen. (Figure 2c)	Diffuse calcification seen. Mild mal-alignment of incisors (Figure 2d)	Mild calcified area seen cranial to incisors with a cystic opacity. (Figure 2e)	All incisors mal-aligned. A calcified area seen in growth with encapsulating calcified margins (Figure 2f).	A diffuse calcified area seen cranial to incisors with few incisors mal-aligned (Figure 2g).	A calcified area 4.2X 3 cm seen cranial to incisors in a soft tissue growth.
Histological findings	Not done	Not done	Not done	Chronic active inflammation	Not done	Myxoma	Not done	Fibroma Durum
Surgical findings	5 incisors removed. Silk sutures applied.	The 14cm growth was resected using wire saw and BP blade (Figure 3a). 5 incisors removed. Silk sutures applied. (Figure 3b)	The growth was resected with wire saw and bandaging done. (Figure 3c)	Growth resected using wire saw and BP blade. Silk sutures applied for apposition. (Figure 3d)	Not operated	21cm growth resected with wire saw along with all incisors (Figure 3e). Silk sutures applied for apposition (Figure 3f).	Not operated	The 15cm growth was resected (Figure 3g) using wire saw and silk sutures applied (Figure 3h).
Short term Outcome	The wound healed	The wound healed.	The wound healed	The wound healed.	NA	Wound healed	NA	The wound healed
Long term Outcome in 4 months	No re-occurrence (Figure 4a)	No re-occurrence	No re-occurrence. (Figure 4b)	Mild re-occurrence seen. (Figure 4c)	NA	No re-occurrence. Mild brachygnathism seen (Figure 4d).	NA	No re-occurrence

Histopathology revealed chronic active inflammation (Case 4), Myxoma (Case 6) and Fibroma durum (Case 8).

Surgical Findings

All the buffaloes (n=6) were operated under recumbency and xylazine sedation (at the dose rate of 0.02mg/Kg, IV) for non-pregnant and midazolam (0.2mg/Kg, IV) for pregnant buffaloes. Mental nerve block was given with 2% lignocaine (10ml) injected in the mental foramen of the side involved.

The growth was resected from the base using wire saw and if required, fine resection with surgical blade. The involved or loose incisors were also removed. The bleeding was controlled using pressure and mucosa to mucosa sutures were applied using no. 2 silk (Figure 3b and 3h). Temporary padded bandaging of the operated site was done if bleeding persisted (Figure

3c). The size of the growth resected varied from 8 to 21 cm.

Post-Operative Care and Follow Up

All the buffaloes were prescribed antibiotics inj. Ampicillin-Cloxacillin @10mg/Kg, BID for 5 days, inj. Gentamicin @4mg/kg, in two divided doses for 3 days and painkiller as inj. meloxicam @ 0.2mg/kg, OD, for 3 days, intra-muscular. The wound was advised for daily cleaning with water. Suture removal was advised at 14 days post-operative.

All the operated buffaloes were followed up at 15 days (short term) and 4 months interval (long term). Among the 6 operated buffaloes, all were healthy and were eating fine with no ill effect on the foetus of the pregnant ones. No re-occurrence was recorded in 5 of the operated buffaloes (83.33%). One buffalo showed (Figure 4c) mild reoccurrence at 4 month follow up.

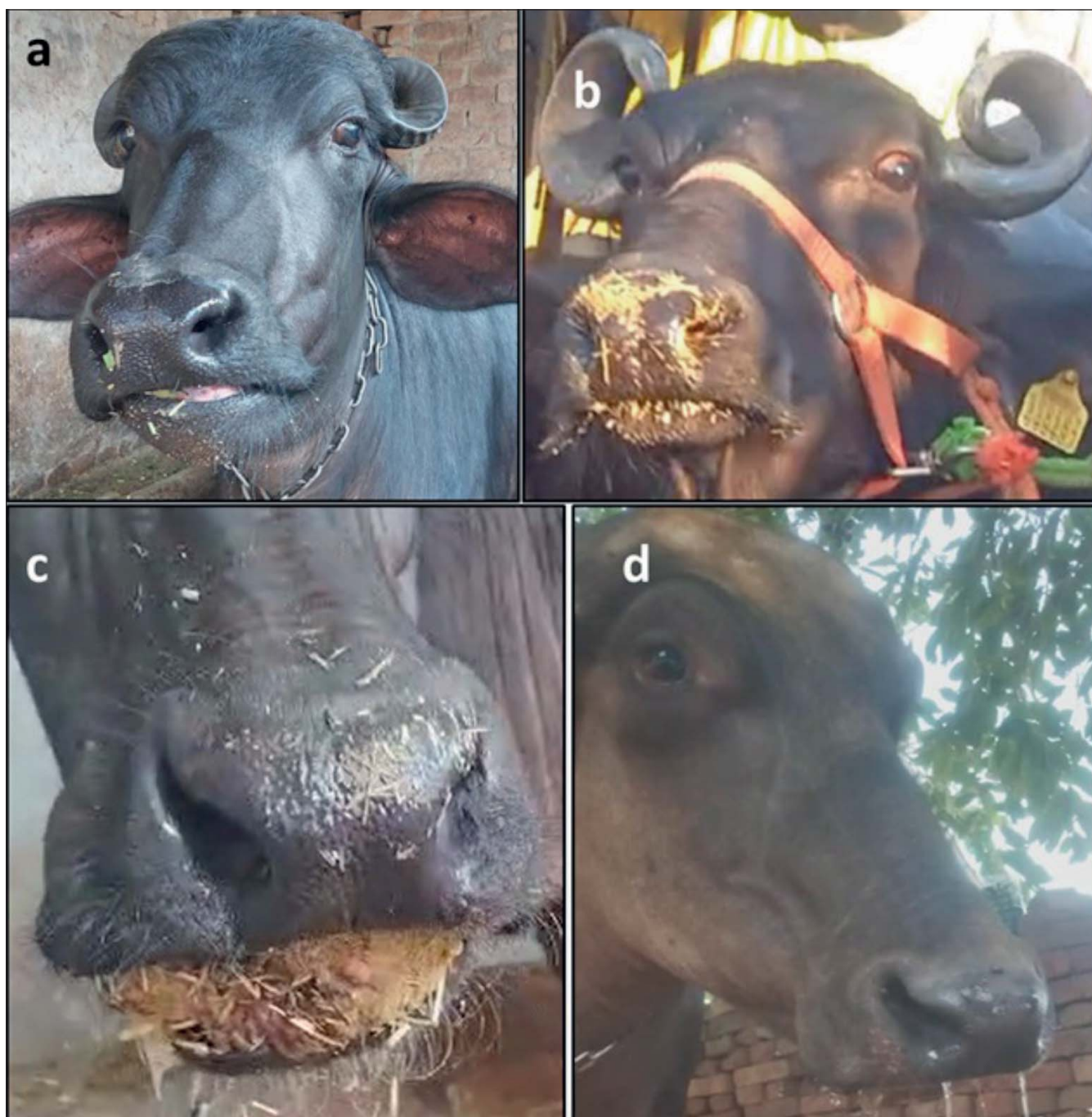


Figure 4 - Photographs showing the 4 month follow up outcome of the buffaloes operated for odontoma. Mild re-occurrence is seen (c).

DISCUSSION

Buffaloes are often presented with odontomas but the aetiology is not known. Any missed trauma in the cranial mandibular region is suspected to be a triggering factor for the outgrowth/odontoma. Most of the odontomas in buffaloes are reported to be benign (4).

Odontomas are hamartomas of aborted tooth formation and are reported to be compound or complex. Compound odontoma had multiple small tooth-like structures while the complex odontoma had an amorphous calcified mass (3). The odontomas reported in the study were all complex type as per the radiographic presentation. There is another classification of odontoma as extraosseous and intraosseous. The intraosseous odontomas occur inside the bone and may erupt into the oral cavity, while extraosseous odontomas occur in the soft tissue covering the tooth bearing portion of the jaws (5). The x-rays of the 6 buffaloes of the present study showed a calcified margin of the growth which seem to be an extension of ventral cortex of mandible, which may define them to be intraosseous but they did not erupt into the oral cavity rather cranial to incisors as an outgrowth. Most of the odontomas are reported to grow a certain size and then cease to grow (5), may be due to regular wearing on the manger surface by the buffaloes. Two of the buffaloes showed a gas opacity in the region of the growth on x-ray, which might be correlated to dentigerous cyst. Although dentigerous cyst along with odontoma is rarely reported in humans (6) and is not reported in buffaloes.

Surgical removal of odontoma in buffaloes can be done under lateral recumbency under mild sedation and mental nerve block. Mucosa to mucosa sutures help in apposition of wound margins and control bleeding (7).

Fibroma and myxoma are uncommon tumours in large animals (8). Myxomas are tumours of fibroblastic origin distinguished by their abundant myxoid matrix rich mucopolysaccharides (9). Fibroma durum are reported to be discrete, raised, hairless nodules in the dermis or subcutaneous fat and are mostly reported in senior dogs but may be present in domestic animals. They palpate as firm and rubbery and are benign (10).

CONCLUSION

The study reports the clinical presentation, radiographic, histological and surgical findings and follow up outcome of buffaloes operated for odontoma. The study recommends surgical removal of the odontoma along with suturing of mucosa for a positive outcome and minimal re-occurrence.

Conflicts of interest

The authors have no conflicts of interests with anyone.

Authors contribution

The study is the MVSc research work of Author 1 who did all the follow up and compilation of data. Author 2, 3 and 5 are the surgeons in various cases. Author 4 is the pathologist.

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