A Rare Case of Cutaneous Ganglioneuroma in a Buffalo

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ABSTRACT

The case of a Murrah buffalo of five years and four month of age was presented with a medium sized growth on the skin close to the lateral canthus of the left eye, thereby interfering the natural movement of eyelids. Due to the location of tumor close to the eye, surgical removal was preferred as the treatment of choice. The excised tumor mass was subjected to detailed histopathological analysis. Detailed microscopic evaluation of hemotoxylin eosin stained tissue sections revealed many mature ganglion cells intermixed with neuromatous cells and nerve fibers. On the basis of these gross and histopathological findings, the tumor was diagnosed as cutaneous ganglioneuroma, a rarely encountered tumor in cattle.

Keywords: Ganglioneuroma, murrah buffalo.

INTODUCTION

Cutaneous ganglioneuroma, a benign tumor of ganglion cells and neuromatous cells is rarely encountered in domestic animals. Many oncologists assume that the ganglioneuromas are generally derived from the cells of neural crest which migrate, differentiate and proliferate in different sites of the body (1). Only one or two ruminant cases especially in cattle and buffaloes have been documented. Sporadic occurrences of these tumors have been reported in other animals like dogs, cats, pigs, and horses (2-8). These tumors are more common in humans as compared to animals. This tumor has been reported to occur at different locations along the autonomic nervous system in the skin, adrenal medulla, gastrointestinal tract, peritoneal cavity and mediastinum (9). Ganglioneuroma can be solitary or multicentric (10). Though benign in nature, it can be a serious threat if it involves the normal functioning of any vital organ. This paper describes the case of cutaneous ganglioneuroma, its diagnosis and successful surgical management in a Murrah buffalo.

CASE HISTORY

A five year and four month old Murrha buffalo with a medium sized growth close to eye was presented to the Government Veterinary Dispensary Grade I, District Thane, India. On physical examination, a grayish solitary growth measuring 3-4 cm in length, was found close to the lateral canthus of the left eye impeding the natural movement of eyelid. The growth appeared painless without evidence of any regional metastasis. Considering the location of growth, surgical removal was preferred as a treatment of choice.

MATERIAL AND METHODS

The animal was premedicated with sedative Xylazine Hydrochloride (Xylaxin, Indian Immunologicals, Hyderabad, India) and under local ring block infiltration with 2% Lignocaine Hydrochloride (Xylocard 2%, Astra Zenea, Bangalore, India), the tumor mass was excised. Along with affected part, small healthy tissue of ad-

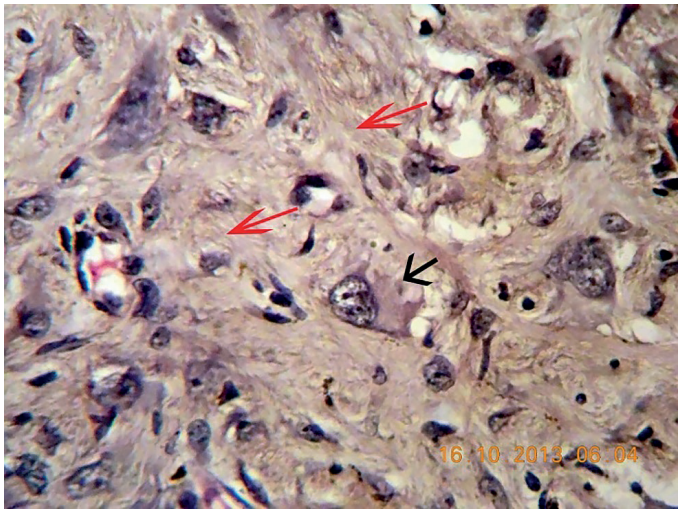

Figure 1: Neoplastic ganglion cells surrounded by schwann cell (Black arrow) intermixed with bundles of nerve fibres (Red arrow) H&E ×1000.

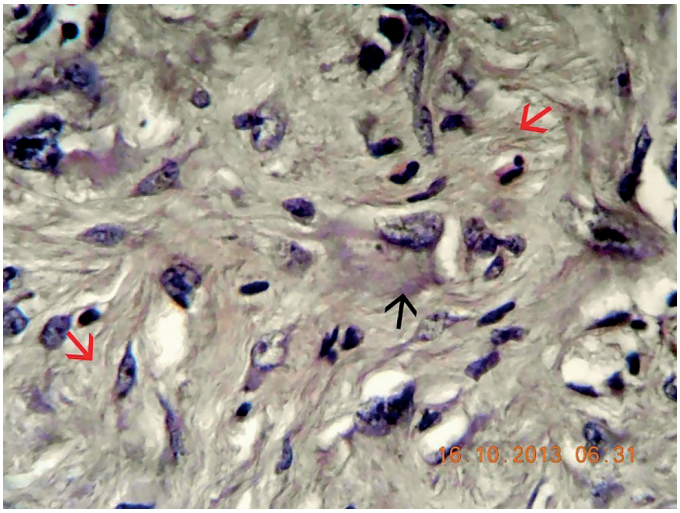

Figure 2: Marginally placed nissl substance (Black arrow) and wavy bundles of nerve fibres H&E ×1000.

joining area around tumor was also removed. The edges of skin were sutured with Nylon using the simple interrupted method. The animal was given post operative medications with Enrofloxacin (Enrocin, Vetnex, Delhi, India), Metamizole (Analgin, Intervet SPAH, India) and regular dressing with Iodine ointment. Sutures were removed after 10th postoperative day. The sections of excised mass were preserved in 10% neutral buffered formalin and processed for routine histopathology using Hematoxylin and Eosin stain (H&E).

MICROSCOPIC FINDINGS

Detailed microscopic examination of (H&E) stained tissue sections (Figure 1) revealed presence of mature ganglion cells with an eosin pink cytoplasm intermixed with proliferating neuromatous cells and wavy bundles of nerve fibers. The ganglion cells were encircled by Schwann cells. The nuclei of proliferating cells were eccentric, vesicular, hyperchromatic and showed mild anaplasia with one or two prominent nucleoli. Mitotic figure were absent. The degenerating nissel substance (Figure 2) was also noticed as basophilic cytoplasmic granules in some ganglion cells.

DISCUSSION

The gross and microscopic profile of the growth were suggestive of a cutaneous ganglioneuroma. Lesions detailed in this case were in conformity with those described by Une *et al*. 1984 and Kheirandish *et al*. 2011 (1, 8). Although the microscopic features presented here are of diagnostic importance in ganglioneuroma, however, in some cases additional tools such as immunohistochemistry are advisable to avoid diagnostic dilemmas. Immunolocalization of protein markers such as S100 in tumor cells can be used to confirm cells of neural origin and to differentiate it from other conditions like fibromatosis (11).

As a benign tumor it does not metastasize to other parts of the body. Complete surgical excision is the treatment of choice for such cases. In cases of skin involvement prognosis of ganglioneuroma is always good, however, it can be at risk if it involves vital organs. Unusual location of tumor in the body may pose serious health complications (12, 13). The development of tumor on or near to the eye may impede the vision and may lead to anxiety and discomfort to the animal. Involvement of the gastrointestinal tract will interfere with the normal digestive process and may cause death by obstructing the intestinal lumen. Development of large tumors in the mediastinal cavity may interfere in respiration or even functioning of the heart (12).

REFERENCES

1. Kheirandish, R., Sami, M. and Dabiri, S. Cutaneous ganglioneuroma in cattle (case report). Comp. Clin. Pathol. 20:269–271, 2011.
2. Allen, D., Swayne, D. and Belknap, J. K.: Ganglioneuroma as a cause of small intestinal obstruction in the horse: a case report. Cornell Vet. 79:133–141, 1989.
3. Hermeyer, K., Kühnt, M., Kuchelmeister, K., Laiks, C., Baumgärtner, W. and Wohlsein, P.: Multiple cutaneous ganglioneuromas in a dog. Vet. Dermatol. 18:360–364, 2007.
4. Murphy, M., Hoss, D., Berke, A., Kerr, P., Gart, G., and Grant-Kels, J.: Cutaneous Ganglioneuroma. Int. J. Dermatol. 46: 861–863, 2007.
5. Nakamura, K., Ochiai, K., Kadosawa, T., Kimura T. and Umemura T.: Canine ganglioneuro blastoma in the oral mucosa. J. Comp. Pathol. 130:205–208, 2004.
6. Patnaik, A. K., Lieberman, P. H. and Johnson, G. F.: Intestinal ganglioneuroma in a kitten—a case report and review of literature. J. Small Anim. Pract. 19:735–742, 1978.
7. Sokale, E. and Ladds, P. W.: Multicentric Ganglioneuroma in a Steer. Vet. Pathol. 20: 767-770, 1983.
8. Une, Y., Iwama, K., Yoshida, H., Shirota, K., Nomura, Y. and Saito, Y.: Multiple ganglioneuroma derived from intramural plexus of jejunum in a sow. Jpn. J. Vet. Sci. 46:247–250, 1984.
9. Gershon, T. R., Shirazi, A., Qin, L-X., Gerald, W. L., Kenney, A. M., and Cheung, N. K.: Enteric Neural Crest Differentiation in Ganglioneuromas Implicates Hedgehog Signaling in Peripheral Neuroblastic Tumor Pathogenesis. PLoS ONE. 4(10): e7491, 2009.
10. Maie, M. G. and Youssef, S.: Nervous System. In: Maxie, M. G. (Eds): Jubb, Kennedy, and Palmer's pathology of domestic animals, Elsevier Saunders, Edinburgh, pp-45, 2007.
11. Ammanagi, A. S., Chikkannaiah, P., Yenni, V. V. and Domle, V. D.: Ganglion cell like, diagnostic dilema. Indian J. Dermatol. 58: 328, 2013.
12. Kobayashi, R., Ohsaki, Y., Yasuno, K., Ogihara, K., Kasai, T., Chambers, J., K. and Shirota, K. A.: malignant and metastasizing feline cardiac ganglioneuroma. J. Vet. Diagn. Invest. 24:412-7, 2012.
13. Chen, C-H., Boag, A. H., Beiko, D. T., Siemens, D. R., Froese, A. and Isotalo, P. A.: Composite paraganglioma-ganglioneuroma of the urinary bladder: a rare neoplasm causing hemodynamic crisis at tumour resection. Can. Urol. Assoc. J. 3:E45-E48, 2009.