

SOLITARY CUTANEOUS MELANOMA IN A CROSSBRED JERSEY HEIFER

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ABSTRACT

A one and half year old heifer was presented with a hard mass hanging from brisket region. The mass was oval shaped, 10 x15 cm in size, pedunculated with the base at the level of carpal joint. Cytological examination revealed melanocytes with the presence of numerous blackish melanin pigments in the cytoplasm. Histopathological examination revealed that the tumor was comprised of heavily pigmented spindle shaped cells, arranged in sheets with a large nuclei and abundant granular black pigment in the cytoplasm. Following surgical removal of the mass, the animal recovered with no recurrence. Based on clinical examination, cytology and histopathological findings, the growth was diagnosed as cutaneous melanoma.

Key words: Heifer, cytology, melanin pigments, histopathology, melanoma.

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Melanomas are benign or malignant neoplasm arising from neuroectodermal melanoblasts, which migrate during developmental stage into the epidermal-dermal junction of the skin, follicles and dermis (Pulley and Stannard, 1990). Melanocytic tumors are most common in dogs, gray horses, and miniature pigs;

uncommon in goats and cattle; and rare in cats and sheep. However, some of the melanoma cases had been reported in cattle (Pazhanivel *et al.*, 2003; Sharma *et al.*, 2010; Naveen *et al.*, 2013 and Madheswaran *et al.*, 2019). The incidence of melanoma in cattle is 5 to 6 % of all bovine tumors (Godoy *et al.*, 2003). They can be found at any age but are most commonly recognized in young animals especially those with red, gray or black skin and congenital forms have also been recognized (Miller *et al.*, 1995). Melanocytic neoplasms in cattle develop infrequently anywhere on the body (Beytut *et al.*, 2018, Pandey *et al.*, 2015).

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Most commonly, the tumors are large, nodular masses, densely pigmented on cut surface, and benign. Excision is curative for most; however, rare malignant variants have been recognized with distant metastasis (Mesaric *et al.*, 2002). The present case report describes the cytological and histopathological features of cutaneous melanoma in cattle and its prognosis.

A one and half year old crossbred Jersey heifer was presented to the Veterinary Clinical Complex, Veterinary College and Research Institute, Udumalpet with the history of a progressively growing mass hanging from the brisket region since one month. The base of the mass was at the level of carpal joint (Fig 1), hard on palpation, oval in shape, measured 10 x 15 cm in size, pedunculated, not attached to the surrounding muscles and evinced no pain on palpation. All the vital parameters of the animal were normal.

Fine needle aspiration biopsy (FNAB) was taken for the cytological examination, stained with Leishman-Geimsa (LG) stain. The mass was surgically resected under local infiltration of 2 % lignocaine HCl. Representative tissue samples were collected and fixed in 10% neutral buffered formalin. After fixation, tissue samples were kept overnight in running tap water, dehydrated with ascending grades of alcohol and cleared with xylene. Then the tissues were embedded in paraffin wax, sections of 5 µm thickness were taken and stained using Haematoxylin and Eosin stain for histopathological examination.

Grossly, on the cross-section, the cut surface of the mass was moderately firm in consistency with diffuse dark black in colour (Fig 2). FNAB smear examination revealed high cellularity with round to polygonal cells, moderate amount of cytoplasm, large nuclei and prominent nucleoli. The cytoplasm of melanocytes was packed with brownish black melanin pigments, the back ground of the smear also highly presented with free melanin pigments (Fig 3). Fine needle aspiration biopsy of prescapular and axillary lymph node did not reveal any presence of melanocytes. Melanomas are classified as epithelioid, spindle cell, mixed and whorled or dendritic melanomas based on the predominant cell type (Brito *et al.*, 2009). Diagnosis of the neoplasm is based on the histological and cytological evaluation. The presence of melanin pigment is the most valuable marker for the identification of melanocyte tumors (Sreenu *et al.*, 2003). However, amelanotic melanoma also had been reported in cattle (Winslow *et al.*, 2017). The causes of melanomas are not known. But predisposing factors had been reported in animals (Miller *et al.*, 1995). In bovines, the melanoma is reported to be caused by secondary mutations due to ultra-violet radiation of the types UVA (320-400 nm) and UVB (290-320 nm) (Slominski *et al.*, 2001).

On histopathological examination, the tumor comprised of heavily pigmented spindle shaped cells, arranged in sheets. Cells had large nuclei and abundant granular black pigment in the cytoplasm (Fig 4). The tumor was confined to dermis (Fig 5). Scott (1998) reported that the malignancy of melanoma

was very uncommon, but metastases could occur. Post-surgical follow up for one year in this case did not reveal any reoccurrence of growth.

In conclusion, based on cytomorphology and histopathology the case was diagnosed as solitary dermal melanoma.



Fig 1. Tumor mass hanging from brisket region



Fig 2. Tumor mass- cut surface- blackish appearance

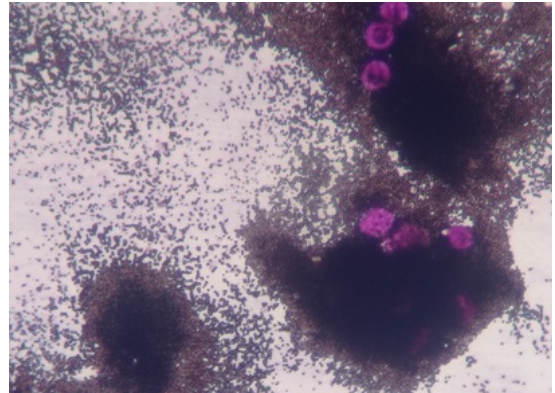


Fig 3. FNAB Cytology -Tumor cells containing melanin pigments in the cytoplasm. Free melanin granules in the background. LG x 400

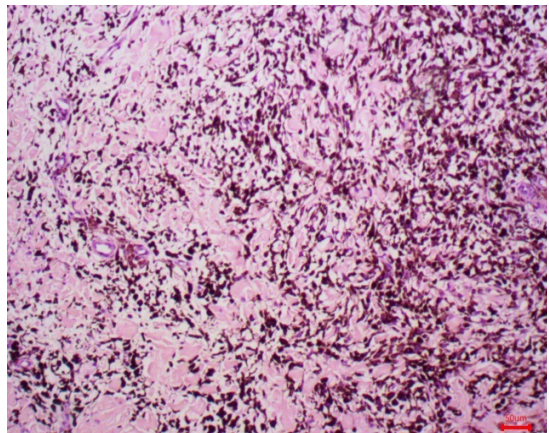


Fig 4. Histopathology - Heavily pigmented spindle shaped melanocytes. H and E x 100

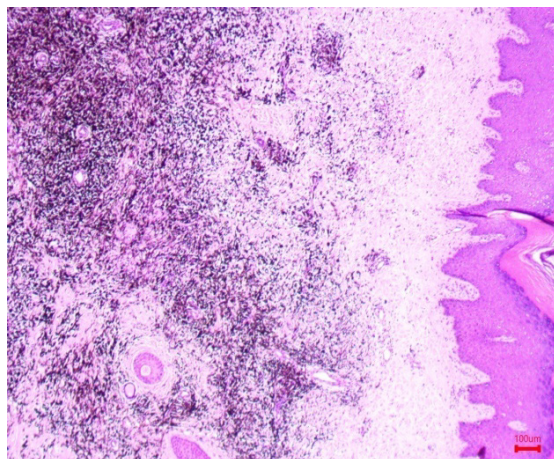


Fig 5. Histopathology - Tumor confined to dermis. H and E x 4

REFERENCES

- Beytut, E., Kili, E. and Yayla, S. (2018). Histopathological and immunohistochemical evaluation of congenital cutaneous melanomas in calves (3 cases). *Ankara Universitesi Veteriner Fakultesi Dergisi*, **65**: 425-432.
- Brito, M.F., Franca, T.N., Jabour, F.F., Seixas, J.N., Andrade, G.S., Oliveira, L.I. and Peixoto, P.V. (2009). Metastasizing oral melanoma in a cow. *Ciência Rural*, Santa Maria. **39**: 1248-1252.
- Godoy, G.S., Borges, V.P., Borges, J.H.S., Prata, L.F., Valadao, C.A.A., Marques, L.C. and Alessi, A.C. (2003). Neoplasias melanocíticas em bovinos da raça Nelore: relato de dois casos. In: *Encontronacional de patologíaveterinária, Fmvz-Unesp. Anais. Botucatu, SP: UNESP*, p. 276.
- Madheswaran, R., Shahana, S., Gopal, K. and Sankar, P. (2019). A case report of non-systemic highly aggressive melanoma in a cow. *Indian Journal of Veterinary Pathology*, **43**(2): 124-126.
- Mesaric, M., Zadnik, T. and Manca, C. (2002). Malignant melanoma in a cow. *Acta Veterinaria*, **52**(1): 59-64.
- Miller, M.A., Weaver, A.D., Stogsdill, P.L., Fischer, J.R., Kreeger, J.M., Nelson, S.L. and Turk, J.R. (1995). Cutaneous melanocytomas in 10 young cattle. *Veterinary Pathology*, **32**: 479-484.
- Naveen, B.R., Chandrasekar, M., Vishwaradhya, T.M., Shambulinga, M., Kumar, P., Singh, D. and Rao, S. (2013). Malignant melanoma in indigenous cattle- a case report. *Haryana Veterinarian*, **52**: 135-136.
- Pandey, M.K., Tripathi, R.M., Tripathi, S.M., Raghuvanshi, P.D.S. and Gupta, N. (2015). Benign melanocytoma in a non-descript cow: A case report. *Indian Journal of Animal Research*, **50**(4): 632-633.
- Pazhanivel, N., Napoleon, R.E., Manohar, B. M. and Ravi, U. (2003). A case of cutaneous melanoma in a bull. *Indian*

- Journal of Animal Research*, **37**: 151-152.
- Pulley, L.T. and Stannard, A. (1990). Tumors of the skin and soft tissues. In: Tumors in domestic animals. (3rdedn.). Moulton, J.E. (ed.), London: Berkeley.
- Scott, D.W. (1998). Neoplastic Diseases. In: Large Animal Dermatology, ed. Pederson D, WB Saunders, Philadelphia, PA. pp. 448-452.
- Sharma, S., Chaudhary, R.N. and Singh, K. (2010). Melanoma in a Haryana cow. *Haryana Veterinarian*, **49**: 78.
- Slominski, A., Wortsman, J., Carlson, A.J., Matsuoka, L.Y., Balch, C. M. and Mihm, M. C. (2001). Malignant melanoma: An update. *Archives of Pathology and Laboratory Medicine*, **125**: 1295-1306.
- Sreenu, M., Srinivas, M. and Nagaraj, P. (2003). Melanoma of the shoulder region in an ongole bullock. *Indian Veterinary Journal*, **80**: 294-295.
- Winslow, C.M., Wood, J., Gilliam, J.N. and Breshears, M.A. (2017). Congenital amelanotic melanoma in a crossbred heifer calf. *Journal of Veterinary Diagnostic Investigation*, **29**(4): 544–547.