

Plasmacytoma: An Infrequent Tumour of Penile *bulbus glandis* in a Non-descript Dog

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Abstract

A case of plasmacytoma of *bulbus glandis* of penis in a dog is reported. One year old non-descript uncastrated dog with the history of swelling at the base of penis was presented. Dog had firm immovable mass under the skin over the base of the penis. Fine needle aspiration cytology was collected and showed highly cellular, individually placed distinct round cells with eccentric nucleus. Perinuclear halo was conspicuous in majority of cells. Under general anaesthesia, the mass was excised. The growth was firmly attached with the *bulbus glandis* of the penis. Histopathologically, the tissue was highly cellular and revealed individual pleomorphic round cells arranged as cords separated by fine fibrous stroma. The neoplastic cells showed variable amount of amphophilic cytoplasm with eccentrically placed nucleus. The nucleus was vesicular and showed mild anisokaryosis. Dutcher's bodies were noticed in few cells. Based on the cyto-histomorphological studies, the case was diagnosed as extramedullary non-cutaneous solitary plasmacytoma at the *bulbus glandis* of the penis in a non-descript dog.

Key words: *Bulbus glandis*, dog, penis, plasmacytoma

Plasmacytoma is a benign round cell neoplasm arising from plasma cells. Broadly,

plasmacytomas are classified as medullary and extramedullary plasmacytoma involving bone and tissues other than bone respectively. Extramedullary plasmacytomas are solitary plasmacytoma arising from the soft tissues of cutaneous and or non-cutaneous origin (Jacob *et al.* 2002; Hayes *et al.* 2007; Mendenhall *et al.* 2003). The cutaneous plasmacytoma is most common having benign behaviour (Lee *et al.* 2020), whereas medullary and non-cutaneous plasmacytomas are found to be malignant (Vail, 2001; Jacob *et al.* 2002). Non-cutaneous plasmacytomas were relatively rare in dogs, affecting mainly the oral cavity and bowel loops (Wright *et al.* 2008) and are rare in the genital tract (Gorenstein *et al.* 2016). This case records the occurrence of extramedullary non-cutaneous solitary plasmacytoma in the penile *bulbus glandis* of a non-descript dog.

An uncastrated one year aged non-descript dog was presented to Veterinary Clinical Complex, Veterinary College and Research Institute, TANUVAS, Orathanadu, Thanjavur, Tamil Nadu, India with the history of swelling over the base of the penis since two months. On physical examination, a firm irregularly spherical, sessile, immovable mass (3 cm diameter) was noticed at the base of the penis covered by intact skin (Fig 1). Urination was infrequent with stranguria. The animal did not respond for vincristine sulfate treatment regimen. Fine needle aspiration biopsy was performed. The animal was referred for surgical excision. Animal was sedated under general anaesthesia and the mass was excised. On excision, the mass was firmly attached with the

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bulb of the penis. The excisional biopsy sample was collected in 10% formalin for histopathological studies. Fine needle aspiration biopsy was subjected for Leishman-Giemsa staining procedure and cytopathological examination. The excisional biopsy tissue was processed as per the standard paraffin embedding protocol for haematoxylin and eosin staining technique (Bancroft and Layton, 2019).

Cytological examination revealed highly cellular architecture and had individually placed roughly uniform, discrete round to oval cells. The cells contained variable amount of abundant, slightly basophilic cytoplasm with round to oval eccentrically placed nucleus. The nucleus was hyperchromatic with coarse to clumped chromatin. The nucleolus was distinct. Perinuclear halo was noticed frequently.

Microscopically, the tissue was highly cellular. The cells were arranged individually forming cords separated by thin layer of fibrous stroma and variable amount of eosinophilic amorphous deposits (Fig 2). The cells were pleomorphic and revealed abundant amphophilic cytoplasm with eccentrically placed nucleus. The nucleus showed anisokaryosis and the nuclear chromatin was coarse to clump. Few neoplastic plasma cells revealed Dutcher's bodies. The nucleolus and peri-nucleolar clearing (Golgi areas) were distinct at few neoplastic cells (Fig 3). Few binucleate plasma cells were seen occasionally. Mitotic figures were meagre and often irregular and atypical (Fig 4).

Based on the clinical examination, the first differential diagnosis could be the transmissible venereal tumour. On further patho-

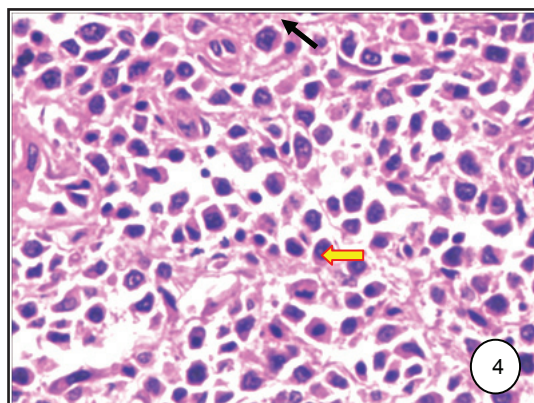
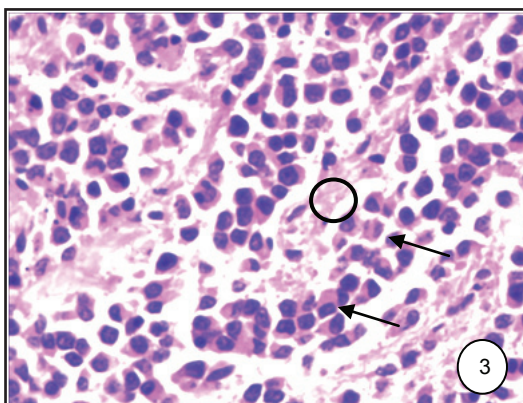
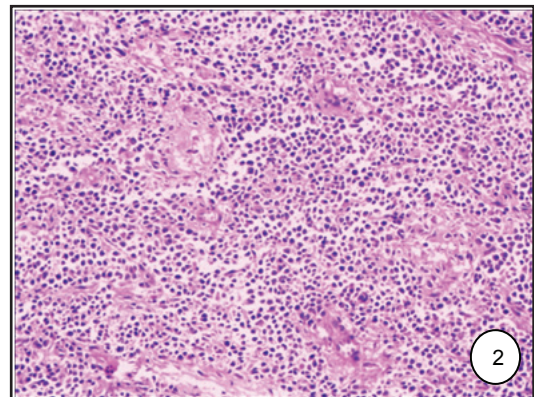


Fig. 1. Penis – Enlarged mass near the base of the penis covered with intact skin. Fig. 2. Individual round cells separated by thin fibrous stroma. Eosinophilic amorphous amyloid among the neoplastic plasma cells – *Bulbus glandis* – Dog H&E x40. Fig. 3. Individual round plasma cells characterized by amphophilic cytoplasm, eccentrically placed nucleus, anisokaryosis, megalocyte, nuclear pseudo-inclusion Dutcher's bodies (circle) and cytoplasmic globular bodies (Golgi areas) (arrow) and coarse chromatin – *Bulbus glandis* – Dog H&E x400. Fig. 4. Individual round pleomorphic plasma cells showing prominent nucleoli, mitotic figure (arrow), binucleate cells (thin arrow) – *Bulbus glandis* – Dog H&E x400.

logical examination of the tissue such as 1) gross presentation as a tightly adhered firm capsulated mass, 2) failure to respond to vincristine sulfate, 3) the cytological features of perinuclear halo and 4) histological features of loosely arranged individual round cells, presence of amphophilic cytoplasm with typical eccentric nucleus and presence of Dutcher's bodies (a cytoplasmic invagination of nuclear bodies), concludes the case as plasmacytoma. The observations was in parallel with earlier documented reports in dogs (Kim *et al.* 2010; Eyre *et al.* 2014; Gorenstein *et al.* 2016; Pargass *et al.* 2017; Ehrensing and Craig, 2018; Lee *et al.* 2020).

Plasmacytoma is a rare plasma-cell neoplasm from B cell lineage and most commonly reported in dogs. Plasmacytoma are arbitrarily categorised into osseous plasmacytoma, multiple myeloma and cutaneous plasmacytoma as neoplastic entities of plasma cell origin. Plasma-blastic and lymphoplasmacytic lymphoma are grouped under the entities of B-lymphocyte origin found in lymph nodes and non-cutaneous organs. Osseous plasmacytoma and multiple myeloma are grouped under medullary plasmacytoma, whereas cutaneous plasmacytoma of plasma cell origin and non-cutaneous plasmacytoma of B cell origin are grouped under extramedullary plasmacytoma (Mendenhall *et al.* 2003; Ehrensing and Craig, 2018).

Extramedullary plasmacytoma are classified into five histopathological subtypes as solid (mature plasmacytoma with typical plasma cells), hyaline, cleaved, asynchronous and polymorphous-blastic types (Platz *et al.* 1999). Solid type plasmacytoma is reported to be infrequent in dogs (Platz *et al.* 1999). Plasmacytoma frequently represent as a single lesion irrespective of location and named as solitary plasmacytoma (Ozsahin *et al.* 2006). Solitary extramedullary plasmacytoma is an uncommon neoplasm largely seen in dogs of 3-10 years of age.

Occurrence of cutaneous plasmacytoma was reported to be high in Retrievers, Spaniels and Terriers (Lucke, 1987; Sophia *et al.* 2020) but reports are meagre in other breeds of dogs. In contradictory, the present report documents extramedullary plasmacytoma in a non-descript

dog. Most of the extramedullary plasmacytoma occurred in the skin (86%) followed by oral mucosa and lips (9%), colon and rectum (4%) and other sites (1%) which includes the stomach, spleen, genitalia, eyes, uterus, liver, lung and brain (Rakich *et al.* 1989; Kupanoff *et al.* 2006; Kim *et al.* 2010; Vail, 2012; Gorenstein *et al.* 2016; Sophia *et al.* 2020).

Among the tumours affecting the genital tract in dogs, the most common is the transmissible venereal tumour. Occurrence of plasmacytoma reported to be rare in penis (Kim *et al.* 2010; Gorenstein *et al.* 2016). Although there were only a few literatures describing plasmacytoma in canine penis, Kim *et al.* (2010) described a single nodular plasmacytoma of about 1.3 cm at the penis of a 5 year old male Cocker spaniel formed a documentary evidence to support the present case as solitary plasmacytoma. The incidence of the present case was very similar with the occurrence of plasmacytoma at the *bulbus glandis* of penis as recorded by Gorenstein *et al.* (2016). Hence, the present case reports the occurrence of solitary plasmacytoma in the *bulbus glandis* of penis in a non-descript dog and was classified as a mature solid type plasmacytoma. Cutaneous plasmacytoma was reported to be malignant (Rout *et al.* 2017). However, pleomorphic neoplastic cells with mitotic patterns observed in the present instance suggest that the tumour is in the beginning stage of malignancy although metastases could not be detected.

Diagnosis of plasmacytoma largely depends on histopathology and immunohistochemistry, as cytopathology mostly puzzling and would overlays the morphological appearance with other round cell tumours. Plasma cell specific immunohistochemical markers helps in confirmation for the diagnosis. Lee *et al.* (2020) justified the cytopathological observations for initial diagnosis of cutaneous plasmacytoma in dogs. Observation of nuclear immunoglobulin bodies "Dutcher's bodies" and perinuclear golgi area in the present study was in accordance with Eyre *et al.* (2014) who proposed cytoplasmic features for early diagnosis of plasma cell neoplasms. Hence, this report highlights the utility of cytology and histomorphology for the diagnosis of plasmacytoma in situations where

immunohistochemistry is not available for further characterisation.

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