DIAGNOSTIC SIGNIFICANCE OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) FOR LYMPHOBLASTIC LYMPHOMA IN DOGS: CASE BASED APPROACH

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ABSTRACT

Fine Needle Aspiration Cytology (FNAC) is a diagnostic procedure which is yet to grow routes under field conditions in veterinary medicine. Present report deals with a case of 5.5 years-old male Bull Mastiff dog presented at Department of Veterinary Pathology, College of Veterinary Science & Animal Husbandry – Anand, Gujarat with a history of swollen lymph nodes over a period of more than last 3 months. Clinical examination revealed firm growth on pre-scapular as well as popliteal lymph nodes. Other clinical parameters as well as haematobiochemical parameters were within normal range. With dog-owner’s consent, diagnostic FNAC was carried out with aseptic precautions. The case was confirmed as lymphoblastic lymphoma based on microscopic examination of lymph node aspirates stained with Wright’s stain. Owners were counseled regarding the prognosis. Diagnostic significance of FNAC for lymphoblastic lymphoma has been discussed form available literature as a case-based approach. It is concluded that FNAC provides an easy determination of lymphoblastic lymphoma in dog.

Keywords: Diagnosis, Fine Needle Aspiration Cytology, Lymphoblastic lymphoma, Dogs, Prognosis.

INTRODUCTION

Fine Needle Aspiration (FNA) technique has its applications in cytology as well as histology. The term Fine Needle Aspiration Biopsy (FNAB) has been documented for histological study from the biopsied samples while Fine Needle Aspiration Cytology (FNAC) has been used for cytological studies in the aspirates. FNAC is a technique which is used to investigate pathological changes especially in superficial masses and/or lumps. The technique has its widest of applications in the field of oncology and cases with inflammatory processes. It has been commonly performed in human medicine while it is yet to grow roots in field of veterinary medicine at field levels. The technique is safer especially in pets with proper restraint with reduced chances of complications as compared to invasive surgical biopsy techniques.

Metaplastic and neoplastic conditions affecting lymph nodes (i.e., essential part of the immune system) are not uncommon in dogs. Lymphoma resulting due to unregulated growth of malignant lymphocytes, is a common type of cancer in dogs which is clinically represented by a variety of clinical manifestations. This condition in dogs mainly affects lymph nodes, bone marrow, liver, and spleen. Dogs may show enlarged lymph nodes with or without apparent clinical signs [1]. Dog may appear depressed, lethargic, vomiting, losing weight, febrile and anorectic in long-standing cases. In India, a large population of dog-owners possesses lesser knowledge on basic dog-ownership practices [2] which also limits significance of diagnostic anamnesis. The most common clinical approach for such conditions in field practice in India is palpation of superficial lymph nodes (viz., pre-scapular, submandibular, inguinal and popliteal lymph nodes) which directs towards the use of confirmatory tests such as imaging studies [3], FNAC [4], haematobiochemistry, measurement of panhematolymphoid marker [5] and post-mortem
examination. FNAC is by far the quickest possible technique to screen metaplastic or neoplastic changes in lymph nodes. Present report deals with a case-based approach on diagnostic significance of FNAC for lymphoblastic lymphoma in a dog.

MATERIALS AND METHODS
A 5.5 years-old (adult) male dog of Bull Mastiff breed was brought to Department of Veterinary Pathology, College of Veterinary Science & Animal Husbandry, Anand Agricultural University, Anand. Anamnesis revealed firm growth over pre-scapular lymph node from a period of past 3 months. In addition to this, the dog also showed hard blackish colored growth over limb extremities. Dog was otherwise reported to have normal appetite, normal water intake and appropriate behavioral status. Dog was subjected to a detailed clinical examination, estimation of hematological parameters as well as serum biochemical parameters. Furthermore, FNAC was carried out in six steps, viz., (i) Shaving, scrubbing and application of disinfectant (povidone-iodine) as well as local anesthetic (lignocaine gel) at the site, (ii) Aseptic insertion of a 24" needle at the affected lymph node with firm growth on palpation, (iii) Collection of aspirates directly over the microscopic slide, (iv) Fixation of aspirates on glass slides with alcohol, (v) Staining of fixed aspirates by Wright’s stain and (vi) Examination under microscope.

RESULTS AND DISCUSSION
Clinical examination revealed growth of a mass over superficial palpable lymph nodes (Figure-01) which was firm in consistency on palpation (i.e., suggestive of spread of tissue metaplasia), infective callus formation over elbow joints bilaterally (Figure-02) as well as blackish discoloration and thickening of skin over dorsal surface of paws (Figure-03). Rectal temperature (101.2°F), respiratory rate (32 per minute), pulse rate (78 per minute), heart rate (72 per minute), thoraco-abdominal respiration, strong and bounding pulse, absence of cardiac and pulmonary sounds were suggestive of otherwise normal clinical status.

Hematology revealed that haemoglobin (13.0 g/dl), total leucocyte count (10.80×10³/cm³), platelet count (240.00×10⁵/cm³), neutrophils (68.00%) and lymphocytes (32.00%) were within normal ranges [6]. Serum biochemistry revealed that levels of alanine aminotransferase (28.20 IU/L), aspartate aminotransferase (20.60 IU/L), blood urea nitrogen (10.70 mg/dl), serum creatinine (0.96 mg/dl), total serum protein (6.2 g/dl), serum albumin (2.9 g/dl) and serum globulin (3.3 g/dl) were also within normal range [7].

FNAC (Figure-04) revealed lymphoblastic infiltrates in lymph node aspirates.

The case was confirmed as lymphoblastic lymphoma evidenced by lymphoblastic proliferations in the aspirated material (Figure-05, 06). Lymphoma is a cancer with proliferative malignacies of lymphocytes. This can be present within lymph nodes, bone marrow and spleen [8]. Among different types of lymphoma, lymphoblastic lymphoma is the most common and progressive type in dogs. FNAC allowed a relatively easy determination of the cause [4]. Usually, dogs with untreated lymphoblastic lymphoma have a survival period of 60 days; therefore, owners were counseled regarding the prognosis of the condition [8].

Fig 1. Bull Mastiff dog with lymphadenopathy

An adult male Bull Mastiff Dog

Growth of mass with firm consistency – Prescapular lymph node
Fig 2. Infective callus formation on limb extremities on both sides

Fig 3. Hyperpigmentation and thickening of skin - Paws and thigh

Fig 4. Fine Needle Aspiration from popliteal lymph node

FNAC in progress after shaving and aseptic preparation of popliteal lymphnode area
CONCLUSION
Diagnostic significance of FNAC with special reference to lymphocytic lymphoma in a Bull Mastiff dog is discussed. It is concluded that FNAC is an easy diagnostic procedure for confirmation of neoplastic changes associated with lymph nodes in dogs. Furthermore, dogs with lymphoblastic lymphoma generally have guarded to poor prognosis with reduced survival time. Considering this fact, timely practiced FNAC can be used for quickest possible diagnosis.

CONFLICTS OF INTEREST
The authors declare no conflict of interest.

REFERENCES