Case Report

DIAGNOSIS AND MANAGEMENT OF LYMPHOMA IN A GERMAN SHEPERD DOG : A CASE REPORT

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INTRODUCTION

Lymphoma is a common cancer in dogs, comprising 7 – 24 % of all tumors and 83 – 90 % of hematological cancers, and is the primary cancer treated in Veterinary Medical Oncology (Zandvliet *et al.,* 2016). Although few dogs with lymphoma are cured, most cases can be managed for an extended period with chemotherapy, wherein medium to older dogs are more likely to develop lymphoma than younger dogs (Dorn *et al.,* 1967). Diffuse large B-cell lymphoma (DLBCL) is the most prevalent type of lymphoma in both humans and dogs. Due to their high incidence, complex genetic interactions, aggressive clinical course, frequent occurrence, and intact immune system, dogs with lymphoma are an ideal model for studying new treatments for human lymphomas (Aresu *et al.,* 2016).

CASE STUDY

A five-year-old male, German Sheperd dog weighed 27 kg was presented to the Madras Veterinary College Teaching Hospital with the history of swelling in the mandible, prescapular, popliteal and superficial inguinal lymph nodes. Clinical examination revealed enlargement of all the peripheral lymph nodes (Fig 1 and 2). There was non-painful enlargement of lymph nodes and no systemic signs of illness. Involvement of abdominal and thoracic lymph nodes was assessed by ultrasonography. Abdominal ultrasonography revealed enlargement of mesenteric and iliac lymph nodes hypoechoic structures and spleen appeared like swiss cheese pattern (Fig 3). Based on the lesions in spleen and generalized lymphadenopathy including mesenteric and iliac lymph nodes, without abnormal clinical signs, the condition was diagnosed as lymphoma and graded as Stage 'IV' substage as per Owen (1980).

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Anatomically, the present case was classified as multicentric form (Ettinger, 2003). Fine Needle Aspiration Cytology (FNAC) was performed and was stained with Leishman-Giemsa cocktail stain for 45 min which revealed the presence of lymphoblastic cells which were two times larger than the size of erythrocytes (Fig 4).

Neoplastic cells were medium to large sized cells, pleomorphic with multiple nucleoli which were indicative of centroblastic type suggestive of lymphoma (Stacy *et al.,* 2009). Haemato-biochemical changes have been indicated in Table 1 and 2. On 6th week there was mild leukocytosis which was managed Inj. Vetclox @ 10 mg/kg IV for 3 days with fluids (Ringers lactate) while in 8th week there was mild leukopenia so the treatment was skipped and the animal was rested and continued on the next week. Based on clinical presentation, ultrasonographical examination and FNAC the present case is confirmed as canine multicentric lymphoma.

The animal was treated as per Wisconsin Madison modified CHOP-19 protocol. The multidrug protocol consisted of Cyclophosphamide ©, hydroxy doxorubicin (H), Oxy vincristine (O), and prednisolone (P) administered weekly with 4 - week intervals following the initial cycle of medication, as outlined by Garrett *et al.* (2002) for palliative treatment. The animal was regularly monitored for haematological and biochemical values before every therapeutic regime. After stabilizing the dog, it was treated with vincristine at the dose rate of 0.7 mg/m^2 of body surface area and advised to give prednisolone orally at the dose rate of 2 mg/kg body weight. Hematology and serum biochemistry were done every week and they were found to be normal, cyclophosphamide was given at the dose rate of 250 mg/m^2 body surface area and prednisolone 1.5 mg/kg body weight PO. After ninth week, the size of peripheral lymph nodes was very much reduced which indicated complete remission after 8th dose of chemotherapy (Fig 5).

The case was diagnosed as canine multicentric lymphoma based on clinical presentation, FNAC and ultrasonography and was treated with CHOP-19 protocol and remission was observed on 9th week but the protocol was continued up to 19th week and no signs of relapse was noticed. The animal was monitored every month for month after the treatment (19 weeks) animal showed no signs of reoccurrence up to 7 months. Multicentric lymphoma is a disease that the general practitioner can manage; it does not require referral to a specialized practice.

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Table 1. Hematological values before and during CHOP protocol in a lymphoma dog

Parameter	Hb	RBC	WBC	N	L	M	E	PCV	PLT
	g/dl	10^6/cmm	10^3/cmm	%	%	%	%	%	10^3/cmm
Before Chemotherapy	11.4	5.63	7300	74	20	6	-	33.8	541000
1st week	12	4.16	11400	74	20	6	-	25.1	561000
2nd week	9.6	4.97	12500	80	15	4	1	30.1	425000
3rd week	9.5	4.9	13400	75	20	5	-	29.1	529000
4th week	10.2	5.41	10100	75	20	5	-	31	254000
6th week	11.3	6.10	17600	76	19	4	1	33.3	445000
7th week	11	6.06	6300	73	22	5	-	35.6	602000
8th week	11.5	5.05	4900	74	20	6	-	30.5	400000
9th week	13.5	5.83	7900	84	10	4	2	36.9	168000

Table 2. Biochemistry values before and during CHOP protocol in a lymphoma dog

Parameter	BUN	Crt	ALP	ALT	GGT	TP	Albumin	Direct bilirubin	Total bilirubin	Ca	P	Glucose
	mg/dl	mg/dl	IU/l	IU/l	IU/l	mg/dl	mg/dl	mg/dl	mg/dl	mg/dl	mg/dl	mg/dl
Before Chemotherapy	10.8	0.78	96	out	13	7.8	2.6	1.5	1.21	12.19	5.29	99
1st week	9.72	0.95	125	41	8	7.90	2.8	1.16	0.93	9.5	3.52	110
2nd week	8.58	0.99	82	24	5	7	3.2	0.72	0.80	7.90	2.8	90
3rd week	12.5	0.98	169	29	10.6	7.11	3.3	2.08	2.0	10.86	3.69	85
4th week	6.45	0.73	163	17	11.8	6.8	3.2	1.9	1.2	11.13	3.88	102
6th week	8.03	0.87	171	30	13.4	7.90	2.5	1.08	0.93	9.43	4.32	92
7th week	17.41	1.02	178	43	12	8.7	3.1	0.96	0.53	10.28	4.96	67
8th week	23.53	0.83	159	63	11	7.80	2.90	1.21	0.89	11.78	4.93	91
9th week	8.74	0.81	136	56	9	7.6	3.6	1.49	1.3	12.30	7.97	106

Fig 1. Enlarged Popliteal lymph nodein a lymphoma dog

Fig 2. Enlargement of submandibular lymph node (Left side) in a lymphoma dog

Fig 3. Swiss cheese appearance of spleen in a lymphoma dog

Fig 4. After 9thweek of treatment complete remission of lymph nodes in lymphoma dog

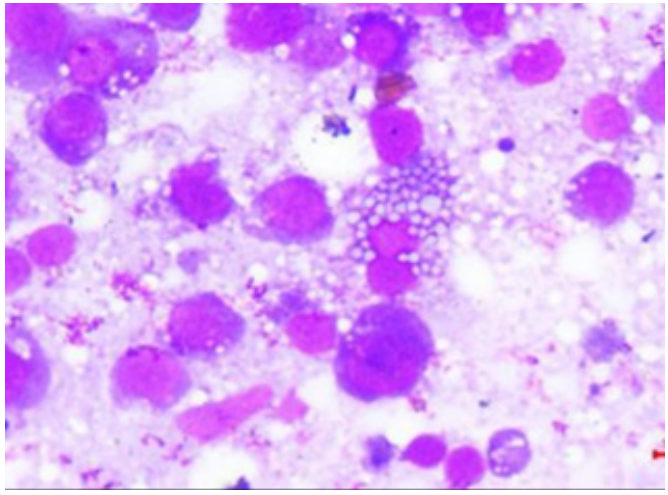

Fig 5. Microscopic examination of FNAC of lymph node showed Russell bodies in a plasma cell-Stained with Leishman-Giemsa cocktail stain -100X