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BRIEF COMMUNICATION

PATHOLOGIC CHANGES AND IMMUNOLOGIC RESPONSES IN *BRUGIA PAHANGI* INFECTED DOGS

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Dogs maintaining chronic *Brugia pahangi* infections in one rear limb were monitored for clinical signs of lymph node enlargement, limb edema and lymph duct dilation and fibrosis, and levels of microfilaremia. Pathologic changes at necropsy confirmed variations in lymph node size and conformation as well as the development of multiple tortuous, anastomosing dilated or fibrosed afferent lymphatic ducts, often bypassing the popliteal lymph node of the infected limb *(Fig. 1)*.

Histopathologic changes of infected nodes included dilated afferent and efferent ducts, marked capsular and medullary fibrosis. Some infected nodes were atrophied *(Fig. 2A)*, while other immunologically reactive nodes were characterized by sinus histiocytosis, follicular hyperplasia and occasional infiltration by eosinophils. Afferent and efferent lymphatic ducts to infected nodes were characterized by marked perilymphatic fibrosis and recanalization with a variable intensity of inflammatory cell infiltrate *(Fig. 2B)*.

Parasite antigen was detected in the popliteal lymph nodes of infected limbs but not in uninfected limbs using immunohistochemical techniques with polyvalent rabbit anti-*B. pahangi* adult worm homogenate antisera. Monoclonal antibodies reactive with canine helper and suppressor/cytotoxic cell subsets were also used to evaluate lymph nodes using immunohistochemistry.

Fig. 1. Gross dissection of a Brugia pahangi *infected dog limb after subcutaneous deposition of dye in the paw, showing markedly dilated, anastomosing afferent lymphatic ducts and prominent subcutaneous ducts which bypass the popliteal lymph node (arrows).*

Table 1

FACS Analysis of Peripheral Blood Lymphocytes (PBL), Infected (INF), and Normal (NOR) Lymph Node Lymphocytes from B. pahangi Infected Dogs

On clinical evaluation, dogs A-E had low microfilaremias and little lymphadenopathy, while dogs F-I had high microfilaremias and recurrent or prolonged episodes of lymphadenopathy.

		Cell Surface Staining				
Dog	Cell Type	Ig+	Pan T	CD4	CD8	CD4:CD8
A	PBL	22	50	32	27	1.2
	INF	52	28	16	10	1.6
	NOR	43	55	15	23	0.7
B	PBL	21	74	38	27	1.4
	INF	41	54	31	23	1.3
	NOR	38	59	32	28	1.1
C	PBL	35	52	24	32	0.8
	INF	41	44	21	22	1.0
	NOR	40	50	19	21	0.9
D	PBL	13	65	43	29	1.5
	INF	53	40	16	16	1.0
	NOR	42	55	18	14	1.3
E	PBL	22	60	39	14	2.8
	INF	53	44	28	9	3.1
	NOR	45	41	26	8	3.3
F	PBL	33	66	43	26	1.7
	INF	41	54	30	6	5.0
	NOR	27	83	50	20	2.5
G	PBL	21	57	28	30	0.9
	INF	35	68	38	8	4.8
	NOR	45	55	28	12	2.3
H	PBL	17	63	42	26	1.6
	INF	51	52	36	14	2.6
	NOR	32	71	48	14	3.4
I	PBL	26	70	38	24	1.6
	INF	42	63	35	11	3.2
	NOR	27	75	40	14	2.9

B cells and T cell subsets were also quantitated in cell suspensions made from infected and uninfected lymph nodes using flow cytometry after labelling with the appropriate antibody *(Table 1)*. Six of 9 dogs had increased numbers of Ig+ cells in the infected popliteal node when compared to the noninfected limb. Four dogs with repeated or prolonged lymphadenopathy in the infected limb showed differences in CD4+ helper cell percentages between infected and noninfected nodes. Examination of CD4/CD8 ratios showed dogs with lymphadenopathy had increased ratios in the infected limb, which were generally a reflection of a low percentage of CD8+ suppressor/cytotoxic cells.

The severity of clinical signs correlated well with gross and histological changes at necropsy. A wide range of clinical responses and pathologic changes in response to low dose multiple parasite infections was observed in *B. pahangi* infected dogs similar to the spectrum of clinical disease described in lymphatic filarial infections in humans.

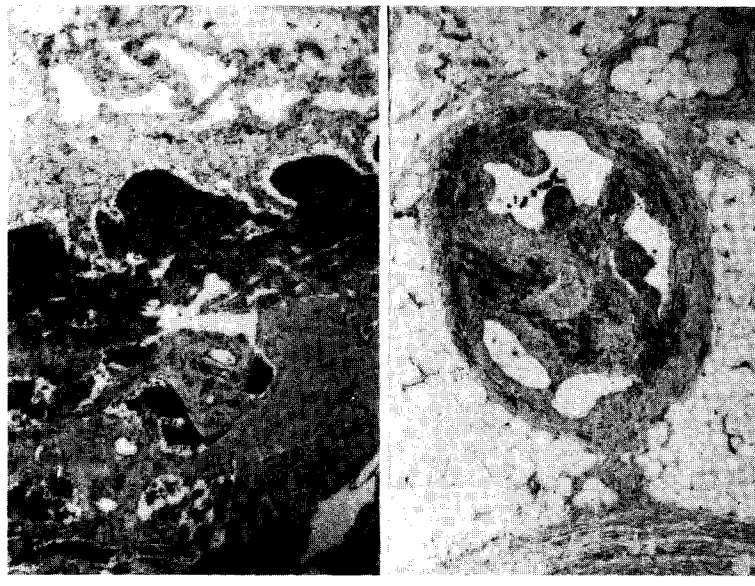

Fig. 2. Histologic sections of popliteal lymph nodes and afferent ducts from B. pahangi *infected dog limbs. Most infected lymph nodes were atrophic and characterized by dilated subcapsular sinuses, thin cortices with few germinal centers, and broad bands of dense fibrous connective tissue in the capsule and in medullary areas (left, 4X). Ducts exhibited marked perilymphatic fibrosis and accumulation of variable numbers of inflammatory cells (right, 4X). Fibrosed ducts were associated with atrophied nodes while ducts with a marked inflammatory infiltrate were afferent to immunologically reactive nodes.*

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