Spontaneous diabetes mellitus in dogs occurs in 0.125% to 0.5% of patients presented to veterinary hospitals, usually in obese females aged 4 to 14 years with a peak incidence at 8 to 9 years.\(^1,2\) Spontaneous diabetes mellitus in dogs under one year of age is less commonly seen, comprising fewer than 1.5% of all canine diabetics.\(^3,4\) Diabetes in young dogs is usually associated with degeneration or atrophy of both the endocrine and exocrine pancreas.\(^5,6,9,10\) Congenital absence or hypoplasia of only the endocrine pancreas has been reported in dogs and in people.\(^11,13,18-20\) In diabetic keeshond dogs aplasia of beta cells in the islets of Langerhans with persistence of the solitary beta cell population is evident at birth.\(^1,8-20\) This report describes the clinical, biochemical, and pathologic findings in a chow puppy with spontaneous juvenile diabetes mellitus.

A 4-month-old, 5 kg, female chow was presented to the Auburn University Small Animal Clinic for polyuria, polydipsia, and rear limb ataxia. Diabetes mellitus had been diagnosed 10 days previously based on glycosuria, ketonuria, and fasting hyperglycemia (406 mg/dl), which was relieved by treatment with NPH insulin (10 to 12 units once a day, subcutaneous). Clinical and neurologic examination revealed reduced insertion potentials of thoracic and appendicular muscles and portions of the ulnar and common peroneal nerves from the level of the elbow and stifle were processed for plastic sections, frozen sections, and teased nerve preparations, as previously described. At necropsy, the pancreas was normal in size and consistency, the liver was enlarged, pale and friable, and there was evidence of previous inflammation. Islets of Langerhans were absent in the body revealed reduced insertion potentials of thoracic and appendicular muscles and portions of the ulnar and common peroneal nerves from the level of the elbow and stifle were processed for plastic sections, frozen sections, and teased nerve preparations, as previously described. At necropsy, the pancreas was normal in size and consistency, the liver was enlarged, pale and friable, and there were no obvious beta cells in the islets of Langerhans with persistence of the solitary beta cell population is evident at birth. This report describes the clinical, biochemical, and pathologic findings in a chow puppy with spontaneous juvenile diabetes mellitus.

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Fig. 1. Insulin immunoreactivity in islets of Langerhans, pancreas, normal dog.

Fig. 2. Immunoperoxidase staining for insulin, pancreas, diabetic chow. No islets of Langerhans are visible. Occasional insulin immunoreactive cells throughout the parenchyma (insert).

Fig. 3. Dispersed atrophic muscle fibers (arrows). HE.

Fig. 4. Several large muscle fibers with internal nuclei. HE.

Fig. 5. Peroneal nerve, focal nerve degeneration (arrows). Paraphenylene diamine stain.

Fig. 6. Linear rows of myelin ovoids and balls. Teased nerve fiber preparation. Osmium tetroxide.
Table 2. Incidence (percentage) of abnormalities in teased nerve fibers from common peroneal and ulnar nerves of a dog with juvenile diabetes.

<table>
<thead>
<tr>
<th>Nerve</th>
<th>No. of Fibers Isolated</th>
<th>Histologic Classification*</th>
<th>Percentage of Abnormal Fibers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common peroneal</td>
<td>118 (130)†</td>
<td>C (0) D (0) E (7) F (0) G (6)</td>
<td>6 (0)</td>
</tr>
<tr>
<td>Ulnar</td>
<td>100 (120)</td>
<td>C (0) D (0) E (7) F (0) G (7)</td>
<td>7 (0)</td>
</tr>
</tbody>
</table>

* C = Single or multiple regions of nodal lengthening or internodal myelin absence; D = Single or multiple C and F abnormalities combined; E = linear rows of myelin ovoids and balls; F = 50% or more difference in myelin thickness between internodes; G = thickening or reduplication of myelin to form "globules" within internodes.
† Numbers in parentheses refer to mean values from two age-matched control dogs.

The clinical manifestations and pathologic findings vary considerably. The neuropathy may be asymptomatic or lead to severe disability. Partial or full recovery may occur following insulin therapy. Although segmental demyelination and remyelination is prominent in some dogs with diabetic polyneuropathy, it is a minor neuropathologic feature in others, being more characterized by axonal necrosis as in this case. Nerve changes are considered to have a distribution in the dog and cat.

Distal sampling of nerves at the metacarpal or metatarsal levels from this dog may have demonstrated more severe nerve pathology.

Results of electrophysiologic testing of skeletal muscle and peripheral nerve tend to be as variable in animals as in man. In general, animals with diabetic neuropathy show a mild to moderate slowing of motor and/or sensory nerve conduction velocities. Abnormal spontaneous potentials may be noted in skeletal muscle including fibrillation potentials and positive sharp waves. The exact etiologic factors and mechanisms by which nerve fibers degenerate in diabetic neuropathies have not been established. It is now believed that vascular factors are unlikely to play an important role in the genesis of the symmetrical polyneuropathies associated with diabetes.

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Ehrlichia of Potomac Horse Fever Identified with a Silver Stain

K. E. STEELE, Y. RIKIHISA, AND A. M. WALTON

Potomac horse fever is a newly identified disease of equids characterized by fever, anorexia, leukopenia, watery diarrhea, dehydration, and approximately 30% case fatality rate. Recent studies have shown the causative agent to be a member of the genus Ehrlichia, in the Family Rickettsiaceae. Nonspecific gross and microscopic pathologic changes associated with the disease have been of little value in diagnosis, and there has been no previous report of a single staining technique which can reliably demonstrate the microorganism by light microscopy in tissue sections and culture cell smears. The toluidine blue stain has been previously used for plastic tissue sections, and Giemsa and Diff Quik (Harleco, Gibbstown, NJ) stains have been used for culture cells, but the organism is difficult to distinguish from other structures such as cytoplasmic granules with these methods. This paper describes a comparison of the modified