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Insulinoma in a Boxer- A case report

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Abstract

A nine-year-old female Boxer was presented to the Small Animal Medicine outpatient unit of Teaching Veterinary Hospital, Madras Veterinary College with the complaint of weakness and occasional ataxia. The general clinical, physical and neurological examinations were found to be normal except for the history of weakness and ataxia. The complete blood count was normal. Serum biochemistry revealed hypoglycemia and the amended insulin to glucose ratio was 187.4. Abdominal ultrasonography and radiography examination were unrewarding. Contrast CT revealed presence of multiple nodular lesions over the pancreas suggestive of insulinoma. The hypoglycemic episodes were managed with dextrose solution followed by dietary management, prednisolone and octreotide. The animal responded to treatment with an improvement in blood glucose level.

Keywords: Insulinoma, Boxer, hypoglycemia, beta cells

Insulinoma is a malignant tumor which secretes excessive amount of insulin to result in profound hypoglycemia (Goutal *et al.,* 2012). Any breed of dog can be affected with insulinoma but usually large breed dogs are overrepresented. Animals with insulinoma will be apparently normal except for the presence of clinical signs of hypoglycemia. Exercise, fasting (increased glucose use), and food consumption (stimulation of insulin release) are common triggers for hypoglycemic episodes in insulinoma.

Case history and treatment

A nine-year-old female Boxer (Figure 1) was presented to the Small Animal Medicine outpatient unit of Teaching Veterinary Hospital, Madras Veterinary College with history of normal appetite, normal voiding habits but occasional episodes of weakness and ataxia. No abnormality was detected during clinical, physical and neurological examinations of the animal. The complete blood count was normal while the serum biochemistry revealed presence hypoglycemia (40 mg/dL). Therefore, multiple tests of blood glucose were carried out on the subsequent days. The multiple blood glucose tests revealed persistent hypoglycemia with a blood glucose level of around 40 mg/dL. The paired serum samples were collected on the following day, measuring serum insulin and blood glucose values which revealed values of 18.74 µU/ml and 40 mg/dL respectively. The amended insulin to glucose ratio was found to be 187.4.

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Amended insulin glucose ratio = (Serum insulin (µU/ml) x 100) / (Serum glucose (mg/dl) – 30)

The abdominal ultrasonography and thoracic and abdominal radiography did not revealed any abnormalities. Contrast CT scan revealed presence of multiple nodular lesions over the pancreas. The owner was not willing for surgical correction and chemotherapy. Hence treatment with dextrose (25% @ 1 ml/Kg body weight intravenously), prednisolone (@ 0.5 mg/Kg body weight OD PO) and octreotide (@ 20µg SC q 8hr) was advised. The dietary management included multiple small meals of high protein, fat and complex carbohydrates. Animal responded to the treatment with improved blood glucose value of around 60 mg/dl.

Discussion

Insulinoma is defined as an insulin-secreting tumor of pancreatic beta-cells (Feldman and Nelson, 2004). The majority of insulinoma's clinical symptoms are caused by neuroglycopenia in the central nervous system, and by the release of large amounts of counter-regulatory hormones in reaction to hypoglycemia, particularly catecholamines (Kruth *et al*., 1982 and Tobin *et al*., 1999). Clinical symptoms including weakness, collapse, ataxia, confusion, and seizure activity. Dogs with insulinoma typically have normal physical examination findings as reported by Dunn *et al*. (1993). Some dogs with insulinoma were found to have peripheral polyneuropathy, which is characterized by pelvic limb paresis or tetraparesis with diminished to nonexistent appendicular reflexes. Concurrent hypoglycemia (<3 mmol/L) and hyperinsulinism

(serum insulin within or above the reference range) are characteristics of insulinoma (Dunn *et al.,* 1993). In dogs with insulinomas, thoracic and abdominal radiography is typically normal. Pancreatic mass can be seen on ultrasound in about 56% of dogs with insulinoma. With a reported sensitivity of 71%, dual-phase computed tomography (CT) seems to be the most useful method for detecting a pancreatic mass (Tucker *et al.,* 2006).

Treatment includes surgical correction and medical management. Surgical removal of tumor provides best relief from the clinical signs of insulinoma. Medical management includes the use of dietary management as well as prednisone, diazoxide, and octreotide (Tobin *et al.,* 1999: Polton *et al.,* 2007 and Goutal *et al.,* 2012). Octreotide is used to treat hypoglycemia in dogs with insulinomas as it inhibits insulin release. This somatostatin analog is available for injection as a SC, IM, or IV (Simpson *et al.,* 1995). Mestastatic disease can be managed with either streptozocin or tyrosine kinase inhibitors (Grant and Burgess, 2016).

Fig. 1. Dog with insulinoma

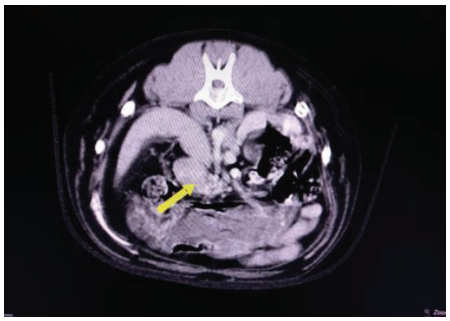

Fig. 2. CT reveals nodular lesions in pancreas

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