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CONGENITAL HYPERTHYROIDISM IN A CAT: A CASE REPORT (With One Figure)

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زيادة إفراز الغدة الدرقية الوراثي المرضى فى قط

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قط فارسى عمره عام واحد وصل إلى عيادة الحيوانات الأليفة بكلية الطب البيطرى جامعة أسيوط لتحديد سبب نقص الوزن والنمو المتأخر. أوضح الفحص السريرى تضخم الغدة الدرقية وغياب نزول الخصيتين. وبفحص عينة الدم كان مستوى هورمون التيروكسين (T4) أعلى من الطبيعى كما كان معدل البولينيا فى الدم عال بصورة واضحة بينما كان معدل الكرياتينين أقل من الطبيعى وهذا يدل على إصابة الكلى نتيجة هذا المرض. كما كان العدد الكلى لكرات الدم البيضاء فى المعدل الطبيعى ولكن كانت هناك زيادة فى عدد الكريات الأكلولة مع إنحراف يسارى متحلل. رفضت صاحبة الحالة العلاج الدوائى كما رفضت القتل الرحيم للقط والذي مات متأثراً بالمرض فى خلال أسبوع من تقديم الحالة إلى العيادة. هذا ويجدر الإشارة إلى أنه من الممكن علاج الحالات المشابهة باستخدام الدواء Carbimazole أو العلاج الإشعاعى. أما التدخل الجراحى فيكون باستئصال الغدة الدرقية ولكنه يحمل خطورة حدوث إنخفاض إفراز الغدة الدرقية المرضى. وترى الباحثة أن هذه الحالة الأولى المسجلة لتضخم الغدة الدرقية المرضى الوراثى فى قط فارسى فى مصر.

SUMMARY

A one-year-old Persian male cat was presented at the Small Animal Clinic, Assiut Veterinary Teaching Hospital for a general health check and advice on poor weight gain/stunted growth. Clinical examination revealed enlarged thyroid gland and un-descended testicles. Thyroxine (T4) level was above normal (90.09; reference range 40-70 nmol/l); urea level was markedly increased (39.98; reference range 3-15 mmol/l) and creatinine concentration was slightly below normal (143.2; reference range 150-180 µmol/l) suggesting renal involvement. A normal total

leukocytic count, neutrophilia with degenerative left shift was also detected. The owner declined medical treatment and euthanasia and the cat died one week from presentation at the clinic. Medical therapeutics (e.g. Carbimazole) and radioactive isotopes are two of the treatment options recommended for similar cases. Surgical excision is another option although not without the risk of resultant hypothyroidism. This is, to the author's knowledge, the first case report of juvenile/congenital hyperthyroidism in a Persian cat in Egypt.

Key words: *Cats, feline hyperthyroidism, congenital hyperthyroidism, juvenile hyperthyroidism, CRF*

INTRODUCTION

Hyperthyroidism is the most common endocrine disorder in elderly cats. The historical and clinical features of hyperthyroidism have been reviewed in a 126 affected cats and include weight loss, polyphagia, polyuria/polydipsia, tachycardia, hyperactivity, diarrhoea and respiratory abnormalities. Other clinical signs include cardiac abnormalities, skin lesions, vomiting, moderately raised temperature, decreased activity, decreased appetite, congestive cardiac failure, haematuria and intermittently decreased appetite (Thoday and Mooney, 1992).

The diagnosis of hyperthyroidism is straightforward and is based on clinical signs including palpable enlarged thyroid gland, chronic weight loss and elevated serum levels of total thyroid hormone concentrations (Peterson, 2006). There are, however, a growing number of cats showing clinical signs of hyperthyroidism and palpably large thyroid glands whose serum total thyroxine (T4) and triiodothyronine (T3) concentrations are within the normal or borderline range (Graves and Peterson, 1990). This condition can be referred to as occult hyperthyroidism. Although a surplus of reports on hyperthyroidism in cats is available, a search of congenital hyperthyroidism in kittens failed to provide any reports. One report describing juvenile hyperthyroidism in a cat has been recently published (Gordon *et al.*, 2003).

CASE DETAILS

A one-year-old, male cat was presented at the Small Animal Clinic, Assiut Veterinary Teaching Hospital, Assiut University for a general health check and advice on poor weight gain. The cat had been presented at the same clinic eight months earlier as part of two-kitten litter-mates that were presented for a general health check. At the time of the first health check, the kittens appeared healthy except that they had un-descended testicles; the owner declined any hormonal therapy to deal with that problem at the time.

The cat had a history of increased appetite (polyphagia) but was unable to gain weight according to the owner's remarks. On examination, the cat was bright and hyperactive but tolerant of the physical examination. The cat's size was that of a three-month old kitten as well as being thin and when compared to its litter-mate, was half its size (Figure 1). Examination also revealed enlarged and clearly palpable thyroid gland.

Investigations

A minimum data base (complete blood count [CBC], biochemical profile, and hormonal profile revealed a mildly increased urea of 39.984 mmol/l (reference range, 3-15mmol/l) and creatinine of 143.208 μ mol/l (reference range, 150-180 μ mol/l); a mild non-regenerative anemia with a red blood cell count of $4.6 \times 10^{12}/L$ (reference range, 5.0 to $10 \times 10^{12}/L$); and a degenerative left shift with a normal leukocyte count of $8.2 \times 10^3/\mu l$ (reference range, $5 \times 10^9/l$ - $14 \times 10^9/l$).

Thyroxin of 90.09 nmol/l (reference range, 40-70 nmol/l) was detected in blood. Due to the poor prognosis and the rapid deterioration of the cat's condition, the owner refused treatment options and for religious reasons also declined euthanasia. The cat died a week after the visit to the clinic.



Fig. 1: Two (litter-mates) male Persian cats; pictures showing (a) kittens aged 3 months old showing similar size, (b) the same two cats at one-year old with a remarkable difference in size as the hyperthyroid cat has failed to grow at the same rate as its litter-mate, and (c) the external genitalia of one of the cats showing cryptorchidism.

DISCUSSION

Congenital hyperthyroidism is a rare endocrine disease of cats and, to the author's knowledge, has not been previously reported. In the case reported here, a one-year old male Persian was diagnosed with hyperthyroidism. From the case history and clinical presentation it is possible that this cat had hyperthyroidism since it was three-months old. Adult onset feline hyperthyroidism is commonly reported and its diagnosis and treatment are both well-established (Graves and Peterson,

1990; Peterson, 2006). The diagnosis of hyperthyroidism is straight forward and is based on clinical signs and demonstration of elevated serum levels of T4 (Peterson, 2006). However, "occult" hyperthyroidism is now reported more often where normal serum levels of T4 are detected in cats with palpably enlarged thyroid glands (Peterson, 2006). Serum thyroid hormone concentrations can fluctuate in and out of the normal range in some cats with hyperthyroidism (Peterson *et al.*, 1987). In these cases, the use of a T3 suppression test as an aid at the diagnosis of early, mild, or occult hyperthyroidism in cats can be used (Graves and Peterson, 1990).

Cryptorchidism in this cat and its litter-mate suggests a dysfunction of the hypothalamic-pituitary-gonadal axis and may or may not be related to the congenital hyperthyroidism reported here (Nermien Waly, Personal Communication).

The owner of the cat reported here has refused any medical or surgical treatment to spare her cat unnecessary suffering during handling or surgery; and also declined euthanasia for religious reasons. Options of treatment of similar cases include surgical excision of the enlarged thyroid glands (thyroidectomy). Certain complications have been reported following thyroidectomy including the resultant hypothyroidism, which requires treatment, or recurrence (Naan *et al.*, 2006). However, complications have been reported to be uncommon if the surgeon is experienced and when an anesthetic regimen associated with minimal adverse cardiovascular effects was used (Naan *et al.*, 2006). Oral anti-thyroid drugs are also used to treat hyperthyroidism in cats (Buijtels *et al.*, 2006). Medical therapy such as methimazole or carbimazole is recommended in cats with pre-existing chronic renal failure (CRF) (Langston and Reine, 2006). Radioactive iodine therapy is also used for treatment of feline hyperthyroidism; however, because it is excreted in urine and saliva, treated cats can accumulate radioactive iodine (I-131) on their coats from contacting soiled litter and grooming. This could result in removable radioactivity, which is a potential source of human exposure to radiation (Chalmers *et al.*, 2006).

In conclusion, in this case report urea level was elevated indicating renal involvement and prognosis was poor. Cat could have responded to carbimazole treatment which is available for humans in Egypt. Surgical treatment was not an option due to lack of experience in this intricate surgery and the cat's poor body condition. The owner declined medical treatment but it should always be considered in similar cases.

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