

Case Report Purina no. A01 "Uta"

1. Introduction

Uta is a 12-year-old female pinscher cross. She was brought in for consultation in spring 2016 for inappropriate urination.

She lives in a detached house and is the only animal in the home. She is not very active, goes out mainly in her garden and is not often walked.

She is fed supermarket dry food provided as a single daily meal.

She is spayed and her vaccinations are up to date. Apart from a heart murmur, not yet examined by echocardiogram, her medical history is unremarkable.

2. Clinical examination

Uta started urinating in the house at night, which prompted the owner to seek a consult after five days. The family recently noted that she was drinking more than before. This suggested a polyuria-polydipsia syndrome. Uta is less active than usual, even a little weak.

The clinical examination reveals Uta to be a friendly little dog, very calm, slightly overweight (5.6 kg, body condition score of 6/9) with a well-maintained coat.

The heart murmur is confirmed in the left apex, and it has progressed since last year (III/VI) with no signs of decompensation. Abdominal palpation reveals a slightly large bladder with no other abnormalities.

- Female dogs at greater risk than males ($P < 0.001$)¹ with an increased risk in entire females
- Dogs weighing less than 20 kg at greater risk than heavier dogs ($P < 0.001$)¹
- Age-greatest risk found in dogs 10- 15 years old¹ and 80% of diabetes cases diagnosed in dogs between 5 and 12 years of age²

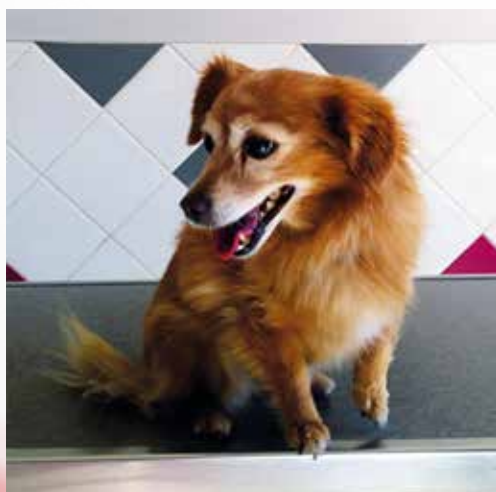


Photo 1: Uta

3. Additional examinations

Further tests revealed a preprandial blood glucose level (measured using the AlphaTrak glucometer by Abbott at the clinic) of 3.28 g/l, glycosuria (Bayer Multistix® 8SG urine dipstick) greater than 2,000 mg/dl as well as an absence of ketone bodies in the urine and no urinary infection (urinalysis), an increase in blood fructosamine concentration (476 $\mu\text{mol/l}$), alkaline phosphatase (ALP=120 IU/l), triglycerides (1.7 g/l) and cholesterol (2.61 g/l), an apparent lymphopaenia (1,340 $\times 10^6/l$) with no real stress leukogram (leukocytes=10,300 $\times 10^6/l$) and an increase in canine pancreas-specific lipase (cPL=313 $\mu\text{g/l}$). The other haematological and biochemical parameters, including T4 and TSH, were within normal limits. The glucose curve (see figure) showed hyperglycaemia throughout the day, with values between 3.14 and 6.08 g/l.



Photo 2: AlphaTrak glucometer

Blood glucose	0	30 min	60 min	90 min	120 min
	Preprandial	Postprandial and post-insulin			
g/l	3.28	6.08	6.02	5.67	3.93

Blood glucose	4 hours	6 hours	8 hours	10 hours	12 hours
	Preprandial	Postprandial and post-insulin			
g/l	3.72	3.71	3.14	3.90	4.40

Table 1: blood glucose follow-up at D0, on beginning insulin therapy



Photo 3: Multistix® 8SG urine dipstick

4. Therapeutic management and follow-up

All the data collected (case history, clinical examination and results of additional examinations) led to a *diagnosis of diabetes mellitus associated with non-clinical pancreatitis*.

Insulin therapy was initiated with CANINSULIN. It began with a dose of 0.5 IU/kg/d, i.e., 3 IU divided into two subcutaneous injections of 1.5 IU 12 hours apart (+/- 1 hour), at meal times.

Therapeutic food was prescribed (Purina Veterinary Diets Canine DM) with a daily ration of 130 g divided into two meals, morning and evening, at the same time as the insulin injections.

At DO + 7 days:

On clinical examination, Uta was fit and healthy and had resumed her usual level of activity. Her owner described no more weakness or polyuria-polydipsia. Uta was happy to eat the Purina Veterinary Diets Canine DM dog food but had a fluctuating appetite. She was eating half of the ration per day on average. Her weight was stable (5.650 kg).

Blood glucose	0	30 min	60 min	90 min	120 min
	Preprandial	Postprandial and post-insulin			
g/l	NM	ER1	ER1	2.03	1.05

Blood glucose	4 hours	6 hours	8 hours	10 hours	12 hours
	Preprandial	Postprandial and post-insulin			
g/l	1.00	1.89	1.84	2.06	NM

Table 2: blood glucose follow-up at DO + 7 days; NM: not measured ER1: Error because of waiting too long before applying the blood to the strip

The urine dipstick indicated the persistence of glycosuria at 250 mg/dl and the absence of ketone bodies.

Given the clinical improvement, the satisfactory values of the curve (average blood glucose < 2.50 g/l and NADIR > 0.80 g/l (see figure)) and the reduction in glycosuria, the same treatment was maintained without changing the dose of insulin.

At DO + 1 month:

The clinical examination revealed Uta to be doing very well. The owner found her more active. She did worry about her not eating the full prescribed ration, but instead just over half. Uta had lost 300 g in a month but her body condition was still good (body condition score of 5/9).

Blood glucose	0	30 min	60 min	90 min	120 min
	Preprandial	Postprandial and post-insulin			
g/l	1.40	1.90	3.11	2.45	1.86

Blood glucose	4 hours	6 hours	8 hours	10 hours	12 hours
	Preprandial	Postprandial and post-insulin			
g/l	0.80	1.11	0.92	1.05	1.60

Table 3: blood glucose follow-up at DO + 1 month

The blood fructosamine concentration had decreased significantly but was still slightly higher than normal (= 371 µmol/l)

The lymphocyte (2,320 X 10⁶/l) and alkaline phosphatase (ALP=60 IU/l) values had normalized. Asymptomatic moderate hypokalaemia was found.

The urine dipstick revealed glycosuria again (> 2,000 mg/dl).

Despite the high glycosuria value, the fructosamine values had decreased and the blood glucose curve values (see figure) remained satisfactory, so the dose of 3 IU of Caninsulin per day was maintained.

At DO + 2 month:

On clinical examination, Uta was still fit and healthy and seemed happy with half of her ration of Purina Veterinary Diets Canine DM. She had lost another 100 g, and her body condition was ideal (5.200 kg, body condition score of 4.5/9).

Blood glucose	0	30 min	60 min	90 min	120 min
	Preprandial	Postprandial and post-insulin			
g/l	NM	1.49	0.63	0.60	0.52

Blood glucose	4 hours	6 hours	8 hours	10 hours	12 hours
	Preprandial	Postprandial and post-insulin			
g/l	0.83	0.98	3.19	3.06	2.93

Table 4: blood glucose follow-up at DO + 2 months

The blood fructosamine concentration was within normal limits (318 µmol/l).

The urine dipstick indicated the absence of glycosuria and of ketonuria.

Given the slightly low values of the glucose curve (see figure) and NADIR < 0.80 g/l, the dose of insulin was reduced by about 20%, to 2.5 IU per day divided into 1.5 IU in the morning and 1 IU in the evening.

At D0 + 3 months:

On clinical examination, Uta's general health was still good. On the whole, she was still eating half her ration of Purina Veterinary Diets Canine DM, which seemed sufficient for her because she was not seeking additional food. She had lost another 200 g, and her body condition was slightly underweight (5.000 kg, body condition score of 4/9).

Blood glucose	0	30 min	60 min	90 min	120 min
	Preprandial	Postprandial and post-insulin			
g/l	2.28	3.23	4.24	4.01	1.65

Blood glucose	4 hours	6 hours	8 hours	10 hours	12 hours
	Preprandial	Postprandial and post-insulin			
g/l	1.22	1.87	1.24	0.87	2.16

Table 5: blood glucose follow-up at D0 + 3 months

The blood fructosamine concentration had again risen above normal limits (374 µmol/l).

The urine dipstick showed glycosuria again (> 2,000 mg/dl).

Despite the increase in fructosamine and high glycosuria (see figure), the glucose curve values were satisfactory. The insulin dose was therefore maintained at 2.5 IU per day.

5. Discussion and conclusion

As soon as the treatment began, the owner was satisfied because the clinical signs disappeared within a few days without ever returning. Uta liked Purina Veterinary Diets Canine DM, despite not eating very much. She made the dietary transition easily with no difficulties or digestive disorders, which confirms that the food is very palatable and well tolerated. Although Uta ate just half of her ration, catering to just half of her theoretical needs, she seemed satisfied and did not seek additional food. Uta was slightly overweight at first, and her new body condition at the end of the study suited her well.

Uta was seen for a recheck at D0 + 6 months, i.e., 3 months after the end of the study. She was still eating about half her ration of Purina Veterinary Diets Canine DM and had lost a further 650 g. She had become a little thin, and her body condition was between 3/9 and 4/9. Her owner found that Uta was sleeping a lot, but that she was in good health the rest of the time and in particular during walks. The glucose curve revealed an average blood glucose much lower than 2.5 g/l, but the NADIR was less than 0.8 g/l (Table 6). The dose of insulin was therefore reduced to 2 units of Caninsulin per day.

Blood glucose	0	30 min	60 min	90 min	120 min
	Preprandial	Postprandial and post-insulin			
g/l	NM	NM	0.68	0.65	1.21

Blood glucose	4 hours	6 hours	8 hours	10 hours	12 hours
	Preprandial	Postprandial and post-insulin			
g/l	0.85	0.61	1.61	2.76	NM

Table 6: blood glucose follow-up at D0 + 6 months

From a medical point of view, Uta responded very well to the insulin therapy/ Purina Veterinary Diets Canine DM therapeutic food combination, because the glucose curve obtained was satisfactory beginning at D0 + 7 days. In addition, despite a glycosuria relapse on several occasions, it was never necessary to increase the dose of insulin; on the contrary, it was even reduced. This gradual reduction in the dose of Caninsulin can be linked with Uta's weight loss, because the dose in relation to her actual weight remained close to 0.5 IU/kg/d during the six months of follow-up.