Perioperative characteristics, histologic diagnosis and outcome in 32 cats undergoing surgical treatment of primary hyperparathyroidism


Introduction

Feline primary hyperparathyroidism (PHPT) has been described, but has been reported infrequently in the veterinary literature. A single retrospective study in 1991 described 7 cats undergoing surgical parathyroidectomy for the treatment of PHPT with parathyroid adenoma being the most common diagnosis and postoperative hypocalcemia being a rare complication. Given the paucity of data on feline PHPT, further study in a larger cohort of cats undergoing surgical treatment is required. The objective of this study was to determine preoperative characteristics, histologic diagnosis and long-term outcome in cats undergoing surgery for the treatment of PHPT.

A secondary objective was to determine whether a correlation between plasma ionized calcium concentration pre- and post-parathyroidectomy.

Materials and Methods

Retrospective, multi-institutional study with medical record data collection and telephone follow-up. Cats undergoing surgical treatment and histopathologic evaluation of resected tissue were included. Cats were divided into pre-operative ionized calcium (iCa) groups corresponding to the 33rd, 67th, and 100th percentiles of the study population’s pre-operative iCa results.

Results

Thirty-two cats were included in the study. Mean cat age was 13.3 ± 2.4 years and mean cat body weight was 4.9 ± 1.3 kg. iCa was above reference range in all cats (median 1.8 mmol/L (IQR 1.5,1.9)). Intact PTH concentration was tested in 26 cats and reported to be above the normal reference range in 20 (76.9%) and within the normal reference range in 6 (23.1%). All cats underwent cervical exploratory surgery and abnormal tissue was identified and removed in all cats. Histopathologic diagnosis was parathyroid adenoma in 20/32 (62.5%) cats, parathyroid carcinoma in 7/32 (21.9%) cats, parathyroid hyperplasia in 3/32 (9.4%) cats, and parathyroid cystadenoma in 2 (6.3%) cats.

Lowest postoperative iCa had no statistically significant positive correlation with preoperative iCa (Spearman’s ρ=0.158; p=0.405) (Figure 2). At discharge, 6/32 (18.8%) cats had hypercalcemia, 5/32 (15.6%) had hypocalcemia, and 21/32 (65.6%) cats had iCa within reference range. Overall median survival time was 1109 days (95% CI 856 – 1332). Survival time was not significantly associated with pre-operative iCa group (p=0.139), hypocalcemia at discharge (p=0.326), hypercalcemia at discharge (p=0.955), or diagnosis of carcinoma (p=0.930).

Discussion

Feline PHPT is a rare diagnosis with only 32 cases presented in this cohort despite a comprehensive medical record review at 9 veterinary referral centres.

A variety of surgical procedures (parathyroidectomy vs partial thyroidectomy) were performed in the cats of this study to ensure complete removal of abnormal parathyroid tissue. Similar to dogs with PHPT, the majority of cats (62.5%) were diagnosed with a parathyroid adenoma. However, parathyroid carcinoma was diagnosed in 21.9% of cats which is considerably higher than what is reported in dogs.

Based on the relatively high proportion of carcinoma, evaluation of the regional lymph nodes with cervical ultrasonography is recommended preoperatively, with either intraoperative fine-needle aspirate cytology or extirpation and post-operative histopathology in cats with mandibular or medial retropharyngeal lymphadenopathy.

Hypocalcemia was diagnosed in 34.4% of cats in the postoperative period, and none displayed behaviors associated with hypocalcemia in dogs such as pruritis, ataxia, tremors and/or seizures. This incidence of hypocalcemia was lower than what has been observed in dogs. Regardless, while hypocalcemia following parathyroidectomy in cats for the treatment of PHPT appears to be uncommon, vigilant postoperative monitoring of iCa is required to ensure appropriate calcium homeostasis.

Several canine studies have yielded conflicting results when trying to determine which cases may benefit from pretreatment to prevent severe hypocalcemia based on preoperative iCa. Preoperative iCa was not associated with postoperative iCa, hypocalcemia during hospitalization or at discharge, or hypercalcemia at discharge.

The effect of prophylactic preoperative calcitriol administration on postoperative iCa in cats remains unknown. However, clinical signs related to hypocalcemia appear rare in cats suggesting that pretreatment with calcitriol may be unnecessary with post-operative treatment performed according to careful calcium monitoring.

Figure 1. Intra-operative appearance of a parathyroid adenoma in a cat undergoing surgical treatment for PHPT.

Figure 2. Correlation between pre-operative iCa and lowest recorded post-operative iCa in 30 cats following surgery for primary hyperparathyroidism. Each dot represents an individual cat. The line represents predicted values from a linear regression of lowest post-operative iCa on pre-operative iCa with correlation coefficient 0.202, p=0.113. The data indicate that cats with milder pre-operative hypocalcemia also have lower post-operative iCa, but the relationship is not statistically significant.