Elevations in Total Serum Calcium

**Signalment**
- Young, growing giant breed dog

**Repeat total serum calcium measurement**
- In fasted, nonlipemic sample
- Following rehydration of patient

**Normalization of serum calcium**
- Transient causes for hypercalcemia

**Persistent elevations in total serum calcium**

**Potential toxin exposure**
- Plant calcitriol glycosides
- Cholecalciferol rodenticide
- Antipsoriasis creams containing calcipotriol or calcipotriene

**Supportive diagnostic for vitamin D toxin exposure**
Submit serum sample evaluating:
- Ionized calcium
- 25-hydroxyvitamin D
- 1,25-dihydroxyvitamin D

**Caudal displacement of heart sounds**

**Pain or disuse of axial or appendicular skeletal sites**

**Radiographs of anatomic sites**
- Assessment of lung parenchyma
- Assessment of mediastinum
- Assessment for bony changes

**Mass effect involving**
- Anal gland
- Mammary gland
- Thyroid gland
- Salivary gland

**Minimum database**
- Complete blood count
- Serum chemistry panel
- Urinalysis

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iCa = ionized calcium; PTH = parathyroid hormone; PTH-rp = parathyroid-hormone–related peptide, tCa = total calcium
Generalized peripheral lymphadenopathy

Hypercalcemia database
- Elevated iCa
- PTH levels
- PTH-rp assessment

- Elevated iCa
- PTH levels
- PTH-rp assessment

- Elevated iCa
- Low PTH
- Undetectable PTH-rp

- Elevated iCa
- Low or normal PTH
- Undetectable PTH-rp

- Elevated iCa
- Low PTH
- Elevated PTH-rp

Ventral cervical ultrasonography
- Identification of parathyroid nodule

Surgical exploratory with mass removal
- Primary hyperparathyroidism
- Adenoma
- Adenocarcinoma
- Hyperplasia

Consider granulomatous diseases
- Identification of organism
- Support with elevations in 1,25-dihydroxycholecalciferol

Consider neoplastic osteolytic or calcitriol-mediated hypercalcemia

Consider humoral hypercalcemia of malignancy

Cytology or histopathology
- Enlarged lymph nodes
- Involved soft tissues
- Mediastinal masses
- Bone marrow

No underlying pathology identified; consider idiopathic hypercalcemia (cats)

Diagnosis of neoplasia
- Lymphoma or thymoma
- Leukemia
- Carcinoma or other
- Bone sarcoma

Chronic renal disease

Massively enlarged prescapular lymph nodes in a dog with multicentric lymphoma. Multicentric lymphoma is a disease process that is most commonly associated with hypercalcemia of malignancy.