



A Case Report: Immobility and Metastatic Calcification in a 9-Year-Old Male Guinea Pig

Dorna Ghassemi^{1*}, Amirali Raissi¹, Ali Taghipour¹, Soheil Soheili Rad²

*1-Department of Clinical Sciences, Karaj Branch, Islamic Azad University,
Karaj, Iran.*

2- Qazvin University of Medical Sciences, Qazvin, Iran.

Corresponding author E-mail address: dorna.gh90@gmail.com

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Abstract:

Metastatic calcification is a rare condition observed in various animal species, including guinea pigs, often resulting from systemic mineral imbalances. A 9-year-old male guinea pig presented with decreased activity and immobility. Clinical examination revealed palpable masses in the pelvic region, prompting radiographic investigation. Radiographs showed extensive metastatic calcification in the greater trochanter of the femur. The guinea pig was managed conservatively with dietary adjustments to correct mineral imbalances and nonsteroidal analgesics to alleviate pain. The guinea pig demonstrated significant improvement in mobility and overall quality of life with the conservative management approach. Follow-up radiographs confirmed stabilization of the calcification. Early diagnosis and appropriate management, including dietary modifications and pain relief, are essential for improving outcomes and quality of life in guinea pigs affected by metastatic calcification.

Keywords: Guinea Pig, Immobility, Metastatic calcification

Introduction:

Metastatic calcification, characterized by the deposition of calcium salts in soft tissues, is a rare but clinically significant condition that can affect a variety of animal species, including guinea pigs. This condition typically arises due to systemic mineral imbalances, such as excessive calcium or vitamin D intake, low magnesium levels, or renal dysfunction (2). While metastatic calcification is more commonly reported in larger mammals, cases in small mammals like guinea pigs are relatively rare and present unique diagnostic and therapeutic challenges (4). Previous studies have highlighted the importance of diet composition and mineral balance in managing such conditions in guinea pigs (3).

Radiographic imaging plays a crucial role in diagnosing metastatic calcification, helping identify calcified lesions in tissues such as muscles and tendons (5). In guinea pigs, this condition has been associated with various metabolic and dietary factors that affect mineral homeostasis, leading to abnormal calcification of soft tissues (1). This report presents a case of metastatic calcification in a 9-year-old male guinea pig, emphasizing the importance of early diagnosis, appropriate management, and dietary modification in improving the quality of life and mobility in affected animals.

By providing new insights into the diagnosis and management of metastatic calcification in guinea pigs, this report contributes to the existing knowledge in this field and enhances the understanding of this condition.

Case presentation:

History:

A 9-year-old male guinea pig was referred to Pirooz Veterinary Hospital, in March, 2024. The primary complaint was decreased activity and immobility. Upon clinical examination and evaluation of the locomotor system, palpable masses were detected on both sides of the pelvis.

Physical examination:

In physical examination, the guinea pig was found to be in normal body condition. However, palpable masses were detected on both sides of the pelvis, and palpation of the affected area caused pain, prompting a vigorous reaction from the animal. For further assessment, the guinea pig was referred to the radiology department for ventrodorsal (VD) and lateral radiographs of the pelvic region.

Diagnostic Findings:

Lateral and VD radiography of the pelvis were conducted, revealing a massive high-density area near the bone structures of the muscles in the craniodorsal part of both coxofemoral joints (Figure-1). The positioning of the stifle joints was not ideal for

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radiological examination, but the shape and structure of the visible bones were clear and lacked chronic degenerative disease. Extensive metastatic calcification was observed

in the greater trochanter of the femur, consistent with systemic mineral imbalances. No evidence of fractures or other skeletal abnormalities was noted.



Figure-1 Radiography finding: VD (A) and lateral (B) views of the pelvis that revealed extensive metastatic calcification in the greater trochanter of the femur.

Interpretation:

The differential diagnoses for this condition include dietary imbalances such as low magnesium (Mg) and high-phosphorus (P) intake, excessive calcium (Ca) and/or vitamin D consumption, inadvertent cholecalciferol rodenticide poisoning, and renal disease. Radiological findings showed extensive metastatic calcification in muscle tissue. Metastatic calcification, characterized by the abnormal deposition of calcium salts in soft tissues, is a rare but significant condition found in various species, including guinea pigs (4). This

report details a case of metastatic calcification in a guinea pig, highlighting the crucial need for timely diagnosis and management.

Treatment and Outcome:

The guinea pig was managed conservatively with supportive care, including dietary adjustments to correct mineral imbalances. Additionally, the guinea pig was treated with nonsteroidal analgesics to alleviate pain, allowing for the manifestation of normal physiological behaviors and preventing further self-mutilation.

Follow-up:

Over the course of treatment, the guinea pig exhibited gradual improvement. Follow-up radiographs revealed stabilization of the metastatic calcification without further progression. This positive outcome suggests that the management approach, including dietary adjustments, environmental enrichment, and pain management, was effective in addressing the underlying condition and promoting the guinea pig's overall well-being. Regular monitoring and adjustments to the treatment plan likely contributed to the successful outcome, highlighting the importance of ongoing veterinary care in managing complex medical conditions in small animals like guinea pigs.

Discussion:

Soft tissue calcification, also known as metastatic calcification, has been observed in guinea pigs since the mid-20th century and continues to be reported as a condition that predominantly affects male guinea pigs older than one year (3). The presence of calcium in the lumbar muscles can lead to tissue destruction, potentially causing pain in that area. Additionally, an inflammatory process may occur due to the rupture of hydroxyapatite crystals, contributing to focal pain that can be severe.

Reference:

Consequently, affected animals may exhibit scratching behavior, leading to local skin lesions (6). Metastatic calcification in guinea pigs is often linked to systemic mineral imbalances, including disruptions in calcium and phosphorus metabolism. Diagnosis primarily relies on radiographic findings, which typically show mineralization of soft tissues in affected areas (2). Management strategies include addressing underlying metabolic imbalances, providing supportive care, and making environmental modifications to enhance the quality of life for the guinea pig (5).

Conclusion:

Metastatic calcification refers to the abnormal deposition of calcium salts in tissues throughout the body, often occurring secondary to metabolic disturbances or underlying diseases. In guinea pigs, this can lead to immobility and musculoskeletal abnormalities, affecting their ability to move and causing discomfort. Early identification of metastatic calcification is essential for prompt intervention and management. Proper treatment can help alleviate symptoms, improve outcomes, and enhance the overall well-being of affected guinea pigs (5).

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