**Elongation and dental malocclusion in Guinea Pig: a case report**

**ABSTRACT:** Dental problems of guinea pigs have been recognized for many years, including tooth elongation, malocclusion, oral trauma and abscess formation. Malocclusions of this nature may result from genetic, traumatic, dietary and iatrogenic causes. The dietary habits of guinea pigs must be considered as one of the major potential factors in initiating malocclusions. This article proposes to show the dental problems, dietary information and how a proper diet can be beneficial for this rodent. A case report describing the dental treatment of a guinea pig with tooth elongation and oral trauma follows.

**INTRODUCTION**

Due to the increasing popularity of guinea pigs as pets, veterinarians must be prepared for the challenges they will face in treating these patients, due to the unique characteristics of the oral cavity and dental structures of the rodents. Radiographs are essential to evaluate the occlusal plane of this species and the knowledge of the normal anatomy is fundamental to its interpretation.

The guinea pig presents a heterodont, elodont, arradicular hypsodont dentition, that is, both the anterior and posterior teeth grow continually throughout life and do not develop anatomic roots. The apical foramen of these teeth remains open throughout life and the length is raised along the apex, but its position remains stationed in the alveolus, occurring intra-oral extrusion. The supragingival portion is the clinical crown, while the subgingival portion is the reserve crown and together they form the anatomical crown. The continuous formation of the teeth is balanced with the dental wear during mastication and due to this attrition the length remains constant.

The dental formula of the guinea pig is: 2x (I 1/1, C 0/0, P 1/1, M 3/3)=20, being I (incisor), C (canine), P (premolar) and M (molar). Evidence shows that the inappropriate occlusion and the composition of the diet along with conditions in captivity can be responsible for the dental elongation and disease in the oral cavity. These malocclusion conditions affect the animal’s health and it leads the caretaker to seek the help of a specialist in veterinary odontology. Therefore, this article aims to describe the most frequent oral problems in guinea pigs, provide information about diet and consistency of the food, show the techniques of treatment and present a case report of a guinea pig with dental elongation and occlusal imbalance.

**ORAL PROBLEMS AND CLINICAL SIGNS**

Acquired malocclusion, root elongation of the incisors and elongation of the clinical and reserve crown, along with the extension of the teeth apices to the periapical tissues, can promote an increased volume palpable on the ventral surface of the mandible, although this is more frequent in other rodents than in guinea pigs, which have a predominance of intraoral growth. The irregular wear of the occlusal surface of the teeth leads to formation of dental tips, being that the mandible teeth present tips directed toward the tongue that, depending on the length, can form an arch, trapping it. Teeth from the maxilla will form tips directed to vestibule, causing lesions on the cheeks and pain in the oral cavity.

The dental elongation in guinea pigs can result an inability to completely close the mouth.

There are several oral problems that rodents may have, but regardless of the cause, the clinical signs are always the same: weight loss, anorexia, hypersalivation, elongated incisors, facial abscesses, presence of coarse substances in feces, eye discharge and exophthalmia.

**DIET AND FOOD TYPE**

Guinea pigs are considered true unspecialized herbivores, and their primary foods in nature are grasses such as Brachiaria. In captivity, however, they often only receive concentrated or processed foods in the form of grains or pellets which have a soft consistency and do not have sufficiently abrasive texture such as do vegetable plant fibers, which results in fewer chewing movements.

Feeding a diet with higher energy and lower fiber content results in the animal chewing less. If the patient does not chew vigorously or if the time spent chewing is insufficient, the teeth do not wear naturally, resulting in dental elongation. The stress of confinement and environmental change can also affect the oral health of pet rodents, as in the wild guinea pigs originate from an arid region, with strong and fibrous vegetation, silicate-rich and contaminated with soil dust. This highly abrasive and low energy food is ingested in large quantities to meet the nutritional needs of the animals, resulting in marked wear of the teeth.

Nutritional factors, such as vitamin C deficiency and excess selenium, metabolic deficiencies and genetic factors can also cause oral problems.
TREATMENT

The treatment consists of tooth trimming and occlusal adjustment, respecting the natural angulation that exists in the premolars and molars that is approximately 30° relative to the horizontal plane\textsuperscript{5}, along with changes in the diet, adding more abrasive foods to prevent recurrence or at least extend the interval between procedures\textsuperscript{2,3}.

The technique is done with general inhalation anesthesia and the odontologic exam is possible with the use of a mouth opener to facilitate visualization of the oral cavity, tongue retractors and spatula to protect the mucosa\textsuperscript{1}. The procedure normally is done using a slow-speed motor and straight handpiece, using dental diamond burs for the premolars and molars and diamond discs for adjustment of the incisors\textsuperscript{1,2}. Following the procedure, another cranial radiography must be done to verify if the teeth trimming was sufficient\textsuperscript{4}.

Since the teeth maintain continuous growth and eruption, the situation is dynamic and the owner must be advised that it may take several treatments over the life of the animal\textsuperscript{2}.

CASE REPORT

A guinea pig, 2 years and 10 months old, female, 0.720 kg, was seen at Odontovet – Centro Odontológico Veterinário [Veterinary Dental Center in Brazil] for an evaluation of the oral cavity. The owner reported that the animal’s behavior changed a week ago, had appetite loss, showed selectivity of food, was chewing slowly and gnashing posterior teeth. The last tooth trimming was done three months ago.

A clinical examination diagnosed elongation of mandibular incisors. Clinical examination of this species is difficult due to the small mouth opening, primarily caused by the soft tissue structures, so a radiographic examination of the skull was performed under general anesthesia using the following protocol: ketamine (0.07 ml / IM) + midazolam (0.07 ml / IM) and maintenance accomplished using isoflurane (Figure 1). The radiograph showed dental elongation of premolars and molars (Figure 2). The patient was placed on the proper table for dental trimming of rodents and lagomorphs and after using mouth openers (Figure 4) it was observed in both maxillary and mandibular teeth dental elongation with dental tips toward the tongue (Figure 3). The teeth trimming was performed using a low-speed motor and straight handpiece with carbide bur for premolars and molars and diamond disc for incisors (Figure 5). After treatment (Figure 6), another cranial radiography was performed for comparison (Figure 7). Dipyrone [metamizole] (1 drop [25 mg] /q24h/10 days) was prescribed postoperative.
CONCLUSION

The most common dental problems in guinea pigs are: dental malocclusion and elongation. In most cases, diet is the determining factor for developing this condition. Because this species has continuous dental growth throughout life, chewing fibrous and low calorie food in large quantity is needed to promote dental wear. Treatment by a veterinary dentist is required when a proper diet is insufficient to keep the teeth in good oral health.

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References


