

Elongation and dental malocclusion in Rabbit: a clinical report

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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 rabbit 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 animal. A case report describing the dental treatment of a rabbit with tooth elongation and oral trauma follows.

Key words: *Elongation; Rabbit; Clinical report*

1. Introduction

Occlusion is the relationship or contact between the biting and chewing surfaces of the upper and lower teeth; malocclusion is any deviation in the relationship or contact between the biting and chewing surfaces of the upper and lower teeth. Rabbit's teeth grow continuously, lifelong. The rate of normal wear should equal the rate of growth. Normal wear requires proper occlusion with the opposing set of teeth, and a highly abrasive, fresh food diet to encourage proper movement of the mandible and grind tooth surfaces (Wiggs and Lobprise, 1997). The cause of cheek teeth elongation (rabbit dental disease) is likely multifactorial and not completely known. The most significant contributing factor is feeding diets that contain inadequate amounts of the coarse roughage material required to properly grind tooth surfaces. Malocclusion may also be an inherited defect. When cheek teeth are a normal length, they will contact the opposing set of cheek teeth at an angle such that the teeth will wear normally. If normal wear does not occur and teeth overgrow, sharp spikes or spurs will often form, angling toward the tongue on the bottom arcade and toward the inside of the cheek on the upper arcade (Wiggs and Lobprise, 1997). Spikes on the cheek teeth can become very long and penetrate into the tongue or cheeks. Secondary bacterial infections are common. Cheek teeth that do not occlude normally will continue to elongate into the oral cavity until normal jaw tone arrests upward growth. At this point, pressure from the opposing set of cheek teeth will cause the teeth to grow down into the jaw bone or up into the sinuses. With growth of the tooth roots into bone, abscesses of the tooth roots in the jaw or other area of the face are common (Wiggs and Lobprise, 1997).

The dental formula for a rabbit is: $2 \times (I \frac{2}{1}: C \frac{0}{0}: P \frac{3}{2}: M \frac{3}{3}) = 28$ (Harcourt-Brown, 2002, Caelenberg et al., 2008). The progression of acquired dental disease in rabbits is categorized to 5 grades: Grade 1: Normal, Grade 2: At this stage, the incisors may not have horizontal ribs in the enamel although the shape of the teeth and occlusion can be normal. Hard swellings may be felt along the ventral border of the mandible. These are associated with elongated roots of the mandibular cheek teeth. Grade 3: Loss of supporting bone and alterations in the position, shape and structure of the teeth changes the direction of growth and results in malocclusion. The mandibular incisors tend to tip forward. The maxillary incisors curl and rotate laterally. The mandibular cheek teeth tip towards the tongue and the maxillary cheek teeth flare towards the buccal mucosa. It is possible to have healthy incisors and major changes in the cheek teeth or vice versa. Incisor malocclusion can be caused grooming difficulties or problems pretending food. Sharp spurs on the lower cheek teeth can lacerate the tongue causing anorexia, salivation and pain. Dacryocystitis and abscesses can be seen in this grade. Grade 4: The teeth become so diseased that destruction of germinal tissue at the apex of the tooth results in slowing and cessation of tooth growth. Affected rabbits can manage to eat, albeit slowly with any teeth that remain in occlusion. There can be permanent grooming difficulties and recalcitrant epiphora and dacryocystitis. Many cases do not progress from this stage. Periapical abscesses can occur at any stage. Grade 5: Epiphora, chronic dacryocystitis or rhinitis are often seen in grade 5. It is categorized two subgroups: grades 5a and 5b. Osteomyelitis and abscess formation are seen in grade 5a. There are calcification of the teeth and surrounding bone in grade 5b. Sometimes the crowns break off and roots remain embedded in the bone. Affected rabbits are usually debilitated. It is

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advised exposure to ultraviolet light (sunshine) and all sources of calcium for the affected rabbits (Pollock, 1951; Joel and William, 1983; Flower, 1986; Emily, 1991 and Harcourt-Brown, 2002).

Feeding a diet with higher energy and lower fiber content results in the animal chewing less (Reiter, 2008). 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 (Lendre, 2002 and Reiter, 2008). The stress of confinement and environmental change can also affect the oral health of pet rodents, as in the wild rabbit 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 (Reiter, 2008). Nutritional factors, such as vitamin C deficiency and excess selenium, metabolic deficiencies and genetic factors can also cause oral problems (Wiggs, 1997; Reiter, 2008). 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 at the horizontal plane⁵, along with changes in the diet, adding more abrasive foods to prevent recurrence or at least extend the interval between procedures (Lendre, 2002 and Reiter, 2008). 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 (Wiggs, 1997). 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 (Wiggs, 1997 and Lendre, 2002). Following the procedure, another cranial radiography must be done to verify if the teeth trimming was sufficient (Lendre, 2002). 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 (Lendre, 2002).

2. Case Description and Clinical Findings

In winter of 2012, a four years old male rabbit with 1.900 kg weight was referred to the veterinary clinic. 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 and maxillary incisors. A radiographic examination of the skull was performed under general anesthesia using the following protocol: ketamine/midazolam and maintenance accomplished using isoflurane. The radiograph showed dental elongation of premolars and molars (Fig.1) The patient was placed on the proper table for dental trimming of rodents and lagomorphs and after using mouth openers it was observed in both

maxillary and mandibular teeth dental elongation with dental tips toward the tongue. The teeth trimming was performed using a low-speed motor and straight hand piece with carbide bur for premolars and molars and diamond disc for incisors. After treatment. Another cranial radiography was performed for comparison (Fig.2).



Fig. 1: Lateral radiography in rabbit observe dental elongation in mandible and maxilla



Fig. 2: Lateral radiography in rabbit after treatment

3. Conclusion

The most common dental problems in rabbit 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.

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered all inclusive. Antimicrobial drugs or antibiotics may be prescribed if secondary infection is present. The choices of antibiotics that are available for rabbits are very limited, due to the negative and potentially dangerous effects of many common antibiotics on the rabbit's essential intestinal bacteria. Common, safe antibiotics used in rabbits include enrofloxacin, ciprofloxacin, marbofloxacin, trimethoprim-sulfa, chloramphenicol, or azithromycin. Penicillin can usually be used safely if given by injection only. Pain medications such as butorphanol, meloxicam, or carprofen are commonly used in addition to antibiotics, especially after surgical treatment.

Make sure that the rabbit is eating after the teeth are trimmed. Some rabbits appear to be somewhat painful after teeth are trimmed, especially if molars were extracted. Assisted feeding may be necessary for a short time after these procedures. Return to the veterinarian for rechecks and to have teeth trimmed as needed, every 3–12 months, depending on the severity of disease.

Monitor for signs of recurrence of overgrowth, such as inability to chew, excessive drooling, teeth grinding, or decreased appetite and stool production. Monitor for signs of tooth root abscess or invasion of the tooth roots into surrounding bone or sinuses (excessive tear production, nasal discharge, facial swelling).

In rabbits with acquired dental disease, prevention is not possible once symptoms of malocclusion are present. With periodic molar trimming and appropriate diet, progression of disease may be arrested, but treatment is often lifelong. To help prevent dental disease, discontinue or limit the feeding of pellets and soft fruits or vegetables; provide adequate tough, fibrous foods such as hay and grasses to encourage normal wear of teeth. Do not breed rabbits with congenital malocclusion.

Tooth root abscesses, recurrence, chronic pain, or extensive tissue destruction. Chronic excessive tear production.

Mild to moderate disease, good prognosis with regular trimming and appropriate diet change, depending on severity of disease; lifelong periodic trimming is often required. Tooth root or facial abscesses, excessive bone destruction in the jaw or sinuses depend on severity of bone involvement and location. Rabbits with multiple or severe abscesses have a guarded prognosis. Euthanasia may be warranted with severe or advanced disease, especially in rabbits that are painful or cannot eat.

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