

# Odontogenic abscesses in rabbits: guide to problem

**Author :** Brigitte Reusch

**Categories :** [RVNs](#)

**Date :** January 1, 2008

Brigitte Reusch, BVetMed(Hons), CertZooMed, MRVCS, examines the aetiology, clinical signs and treatment of a common problem

**DENTAL disease and odontogenic abscesses are common in rabbits<sup>1</sup>. All permanent lagomorph teeth grow continuously and erupt into function as the occlusal surface is worn away throughout life<sup>2</sup>. They are, therefore, susceptible to dental developmental problems throughout life.**

## Anatomy and physiology

The dental formula of the rabbit is: 2x (I2/1 C0/0 PM 3/2 M3/3). The gap between the incisors and premolars is known as the diastema. The premolars and molars are often grouped together and called the “cheek teeth”. The second upper incisor is much smaller than the others and is commonly referred to as a “peg tooth”, and lies directly behind the first incisor, in occlusion with the lower incisor. The teeth are aradicular hypsodont teeth, which means that they erupt and grow continuously and never form anatomical roots. Incisor growth and eruption is approximately 2mm to 2.5mm per week in the normal rabbit, with upper incisors growing and erupting slower than lower incisors. The incisors are used to gnaw and slice, whereas the cheek teeth grind food. Cheek teeth growth and eruption is around 2.5mm to 3mm a month, with maxillary teeth growing and erupting slower than the other teeth.

## Aetiology

There are several causes of malocclusion, which is the most common dental abnormality seen in pet rabbits. Mandibular and maxillary abscesses associated with dental infections are common.

Congenital malocclusion first presents at eight to 10 weeks of age, although may only be noticed at 12 to 18 months of age. Breed predispositions of mandibular prognathism include some dwarf and lop-eared breeds. The incidence of incisor malocclusion is particularly high in dwarf-lops<sup>2</sup>. Primary incisor malocclusion and elongation, with the mandibular incisors becoming straighter due to lack of occlusion, cannot be corrected. Maxillary incisors forming spiral curvatures due to occlusion with the mandible, but no dental wear, may penetrate the palate or cheek if left untreated.

Acquired malocclusion is mainly seen in adults. Inadequate dental wear is a common cause where rabbits are fed a highcarbohydrate, low-fibre diet resulting in elongation of both root and crown. Incomplete wear and the curvature of the cheek teeth results in spike formation on the lingual occlusal surface of the mandibular teeth and the buccal occlusal surface of the maxillary teeth. This elongation of the cheek teeth prevents normal occlusion and, therefore, dental wear of the incisors, resulting in secondary incisor elongation and malocclusion ([Figure 1](#)). Calcium deficiency due to selective feeding when offered excessive quantities of coarse-mix food can lead to alveolar bone resorption and tooth loosening, and will enhance the progression of dental resorption. Traumatic injury, including mandibular symphysis separation, temporomandibular joint subluxation, mandibular ramus fractures and tooth fractures with subsequent pulp exposure (often associated with tooth clipping and tooth root abscess formation) are also commonly seen. Many factors are thought to be involved in odontogenic abscesses. In some cases, severe chronic abnormal tooth growth, eruption and wear are likely to be the primary factors. Subsequent infection of the affected tooth may progress from local periodontal infection or systemic spread.

## Historical and clinical signs

Congenital malocclusion first presents at eight to 10 weeks of age, although it may only be noticed at 12-18 months of age<sup>3</sup>. Osteosarcoma, rarely reported in the rabbit, is seen mainly in rabbits aged above six, although it has been reported in an 18-month-old<sup>4,5</sup>. It affects the normal anatomy of the mandible and, therefore, the occlusal plane. Anorexia, dysphagia, bruxism due to pain, ptyalism with secondary moist dermatitis, halitosis, weight loss, reduction in size or amount of faecal pellets, decreased grooming, reduction or inability of ingestion of caecotrophs, abscesses or facial swelling development may all be signs of dental disease.

Pyrexia is not usually seen with abscesses in rabbits. Root elongation of the first maxillary incisor frequently obstructs the lacrimal duct, resulting in epiphoria, dacryocystitis and maxillary abscess formation. Root elongation of the mandibular cheek teeth results in palpable distortion of the normally smooth ventral border of the mandible. Root elongation of the maxillary cheek teeth impinges on the orbit and may prevent globe retraction or cause proptosis as a sequel to retrobulbar abscess formation.

## Diagnosis

Dental disease is usually first suspected on history and clinical findings. Oral examination may reveal some dental and soft tissue changes (tongue and upper buccal mucosa lacerations from spurs/spikes are common sites), but radiography is recommended to evaluate disease of the roots and surrounding alveolar bone. Radiolucent periapical regions due to bone lysis and abscess formation and periosteal bone reaction may be identified on radiography ([Figure 2](#)). There are marked increases in serum alkaline phosphatase, approximately two times the normal value has been documented in cases of skeletal osteosarcoma.

## Treatment and prognosis

Depending on the primary cause of dental disease, corrective burring or extraction of affected teeth, supportive care and diet change to higher fibre diet may be indicated. Burring of incisors can be performed without difficulty in a conscious patient using either high or low-speed dental equipment. Burring of cheek teeth requires general anaesthesia, specialist mouth gags and cheek dilators. A straight, slow-speed dental handpiece with a long-shanked burr is recommended. Clipping and rasping are unacceptable because the former results in tooth fracture and the latter can damage the periodontal ligament.

A soft tissue guard is required to protect the soft tissues either side of the tooth, and can help retract the soft tissue. Cheek teeth must be burred down to the correct level for normal occlusion, and thus spikes will also be removed. Long periods of burring on each tooth should be avoided as this will result in damage to the pulp due to excessive heat. Soft tissue trauma should be treated with systemic antibiotic therapy and analgesia. Normal mastication and grinding is initially reduced until the transverse occlusal ridging reforms and muscles of mastication adapt back to their normal contraction pattern.

Indications for incisor or cheek teeth (premolar and molar) extraction include malocclusion and root infection. If the tooth is loose, due to root pathology or a weak periodontal ligament, the tooth may be extracted by simple traction. The curvature of the tooth must be taken into account. A modified elevator can be used to cut intact periodontal ligaments, but the small size of the oral cavity makes intra-oral manipulation difficult. Once loosened, the tooth should be intruded into the pulp cavity to damage the apical germinal tissue, reducing the risk of continued growth of the tooth, which is usually deformed. Removal of a premolar or molar via a buccotomy incision involves removal of the alveolar bone and the gingival flap, requiring careful surgical technique and intense postoperative care to ensure a successful recovery.

Aggressive surgical debridement and removal of involved teeth is the recommended approach ([Figure 3](#))<sup>1</sup>. Bacteria usually isolated include *Pasteurella multocida*, *Staphylococcus ureus*, *Proteus* spp, *Pseudomonas aeruginosa*, *Bacteriodes* spp and *Fusobacterium*. *Streptococcus*, *Escherichia coli*, *Corynebacterium pyogenes* and *Klebsiella* have also been isolated. Retrobulbar abscesses

usually are associated with tooth root abscesses. Rabbits form thick-walled abscesses that contain caseous, inspissated, purulent discharge in reaction to most bacterial infections. Their pus does not drain as in other species.

Appropriate antibiotic therapy can prove challenging. Antibiotics that have been used include gentamicin, piperacillin, amikacin, tobramycin and cefazolin/cephalothin, although care must be taken to avoid oral absorption of these antibiotics, as they have been associated with fatal enterotoxaemia. The pus is usually sterile; therefore, always submit the abscess capsule or affected bone for bacterial culture and antibacterial sensitivity, so that appropriate antibiotic therapy postoperatively can be used. A retrobulbar abscess may require enucleation. Calcium hydroxide causes severe soft tissue necrosis and, therefore, its use should be avoided.

Where complete resection is not possible, the soft tissue and affected bone should be debrided. Flushing with antiseptic solutions, appropriate antibiotic therapy (systemic and/ or local - for example, gentamicin injected into the capsule), hyaluronidase and honey (clear, unboiled, Manuka honey is reputed to have the most antibacterial properties) are all used to manage abscesses. Penicillin G benzathine/penicillin G Procaine combination has been used in a small number (n=10) of facial abscess cases with good success. However, signed owner consent should always be obtained prior to treatment as the fatal side effects of penicillin in rabbits are well documented.

Long-term prognosis is improved if complete excision is achieved; if this is not possible, re-occurrence is common and may require life-long antibiotic therapy and repeated surgeries. Osteomyelitis carries a poor prognosis. Regular monitoring and early aggressive treatment of subsequent lesions is recommended.

Mandibulectomy only, in dogs with mandibular osteosarcoma, has a one-year survival rate of 71 per cent<sup>6</sup>. Metastasis of the thoracic and abdominal viscera has been reported in rabbits<sup>5,7,9</sup>. As the biologic behaviour of this neoplasm in rabbits is not fully known, surgical excision and chemotherapy would be the most aggressive treatment. Euthanasia is indicated with metastatic disease cases. Prognosis of dental disease is dependent on the primary cause and extent of secondary changes. If there is radiographic evidence of osteomyelitis, the prognosis is guarded to poor.

## References

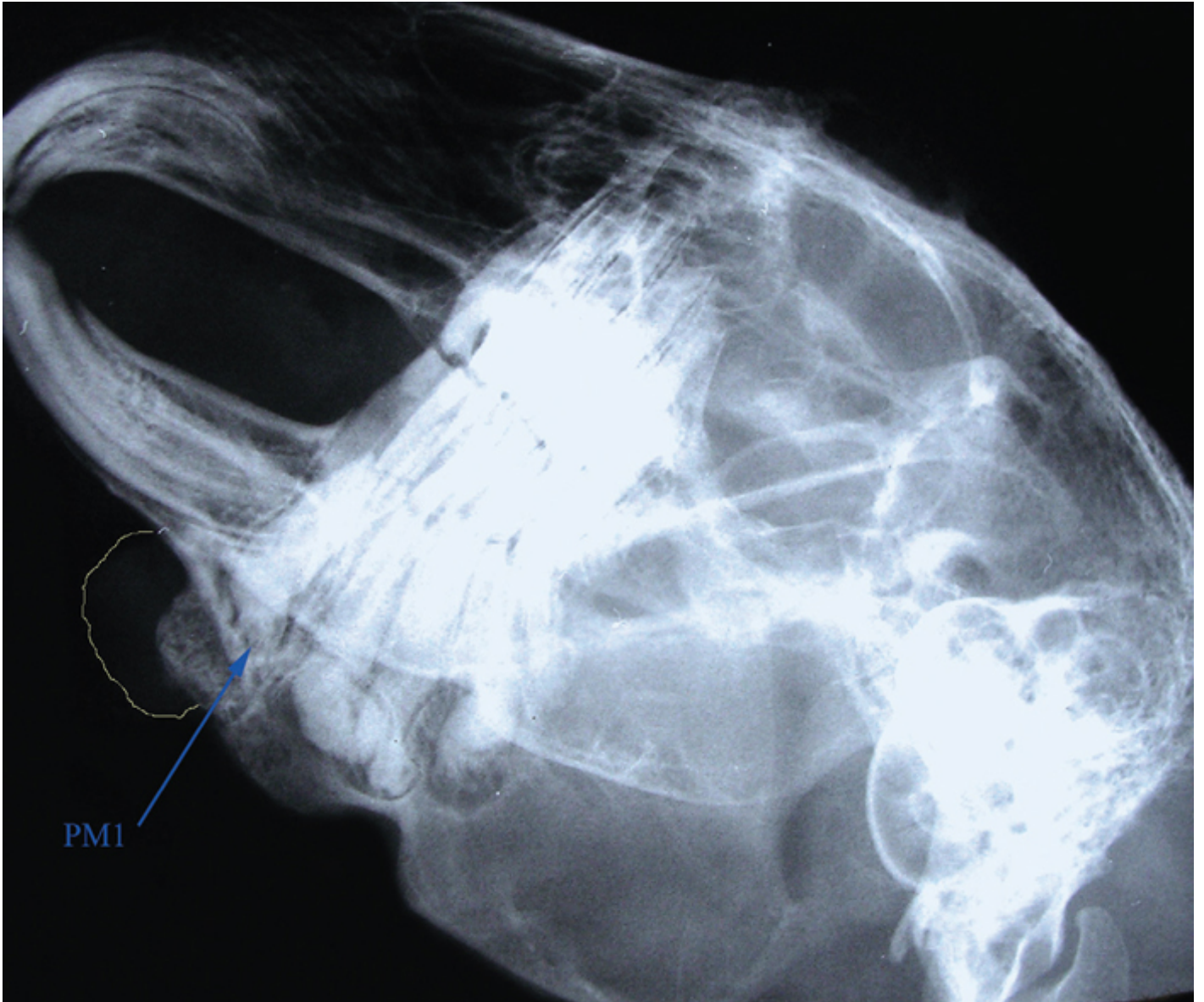
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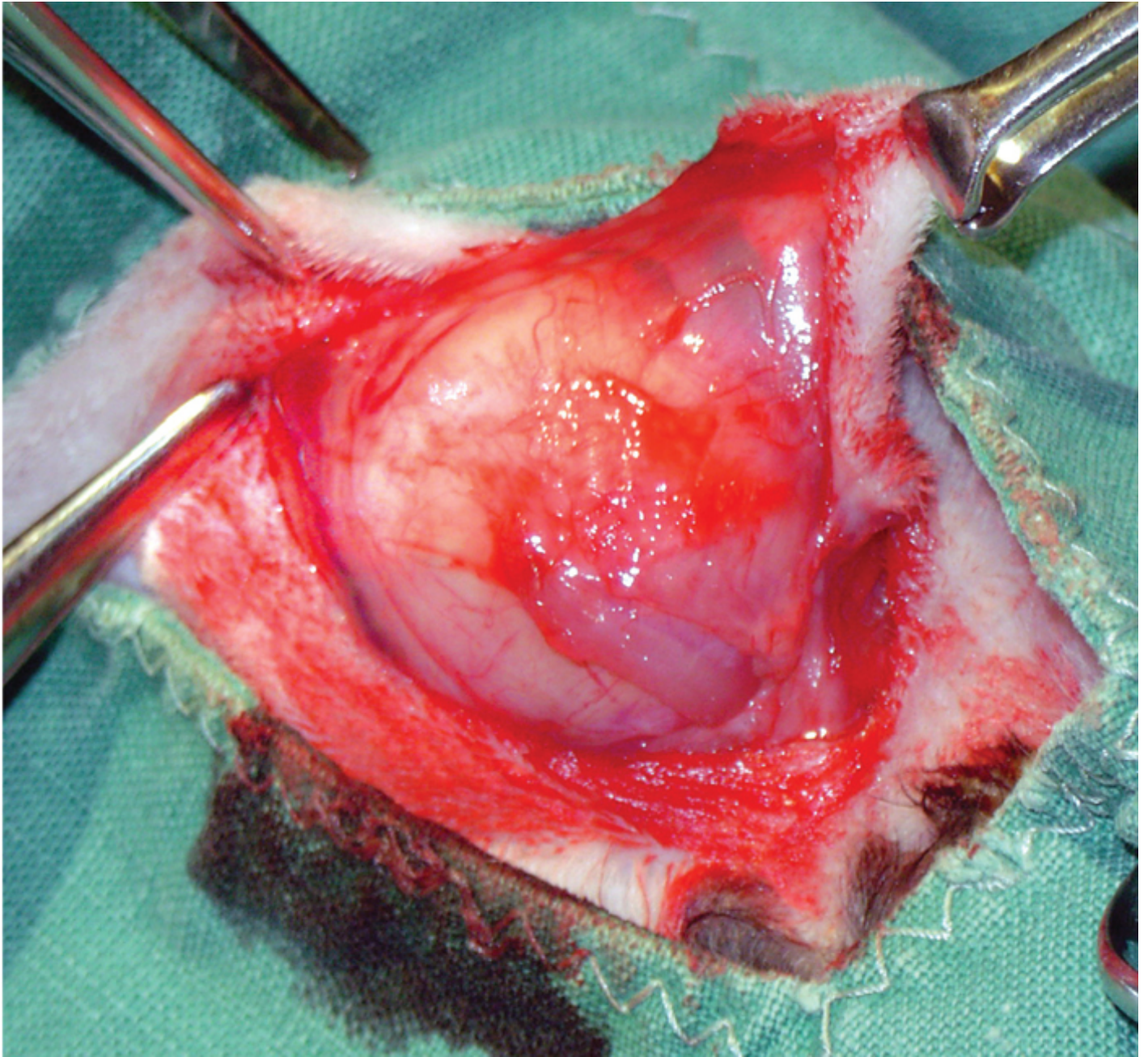
**Figure 1.** Incisor malocclusion and enamel damage in an eight-year-old rabbit.

**Figure 1. Incisor malocclusion and enamel damage in an eight-year-old rabbit.**



**Figure 2. Right lateral oblique radiograph of a rabbit skull with a large soft tissue odontogenic abscess (yellow line) associated with premolar 1 (PM1).**





**Figure 3. Ventral approach to mandibular abscess.**

