

Routine dental examination and preventive care of cheek teeth

Author : TIM BARNETT

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TIM BARNETT in the first of a short series on modern equine dentistry, looks at typical tooth problems in horses and the equipment needed to deal with them

REGULAR dental care is essential to ensure the comfort of the horse when eating and when being ridden and, over the years, much of this work has fallen to the paraprofessional “equine dentist”.

Many are competent in providing complete routine preventive dental care to a high standard, and are often experienced in identifying conditions that may require further treatment. Such diseases will often necessitate veterinary intervention, at which point the general practitioner may be called to examine the patient to treat the condition or provide referral to a veterinary surgeon with further dental experience and training.

Good paraprofessionals have meant the modern equine general practitioner, wanting to provide a good dental service, has had to “up his or her game” to compete with the reputation some of these professionals have attained. In the first of a series of four articles covering equine dental disease, the principles of modern equine cheek teeth examination and preventive care will be covered.

Equipment

Vets should equip themselves with a basic kit to allow a complete examination of the horse’s mouth and specific rasps to complete a full reduction of routine enamel overgrowths. A good quality

mouth speculum allowing adequate examination of the cheek teeth is essential. A flushing syringe to clear the mouth and dental surfaces of food debris and saliva allows unimpeded observation of the tooth surface and oral soft tissues.

A head torch or other source of illumination is the only way an accurate examination of the mouth can be achieved. It also allows safe positioning of dental rasps and monitoring of the rasp during enamel overgrowth reduction. Gloves are a good idea to prevent skin trauma to the practitioner and infection from sharp enamel overgrowths.

A dental mirror provides observation of the occlusal, buccal, lingual and palatal aspects of the teeth, and is invaluable in disease diagnosis. The source of illumination should be focused on the mirror to allow ease of observation. A dental pick or probe is also useful to identify exposed pulps, infundibular caries depth and the extent of any periodontal disease.

The practitioner should carry a bare minimum of three (but, ideally four) different types of dental rasp.

- A long-handled, straight positioned blade allows reduction of the lingual aspect of the mandibular teeth, and the buccal aspect of the '07 to '10 maxillary teeth in most sizes of equid ([Figure 1](#)).
- A long, upturned-headed rasp is essential to access the caudal buccal aspect of the '10 and '11 maxillary teeth, which have a lateral aspect curving caudoaxially ([Figure 2](#)).
- A shorter-handled, downturned head rasp is needed for ease of reduction of overgrowths of the buccal aspect of the rostral '07 and '06 teeth, which have a lateral aspect curving rostroaxially ([Figure 3](#)).
- The natural curvature of Spee of the mid-to-caudal mandibular teeth found in most horses often necessitates the use of either a convex or Gledhill blade, which has a complementary curved surface to allow adequate reduction of overgrowths in these arcades, which curve caudodorsally ([Figure 4](#)). This is the fourth blade ideally included in the general practitioner's kit.

Additionally, S-shaped chip blades can be useful to reduce overgrowths on the buccal aspect of the maxillary teeth.

Examination and history

A history of the horse's eating habits and its behaviour under ridden work can shed light on the significance of any pathology observed on oral examination. Examination of the eyes and nostrils, and evaluation of facial and mandibular symmetry should be a prelude to the oral examination, and again provide information regarding the significance of any oral findings.

Horses with a painful mouth will often drop their feed when eating, especially forage. Food may be chewed for a while and then dropped. This is identified by long cigarshaped pieces of moist food in the stable, which may be noted at the examination or reported by the owner. The horse may noticeably eat on only one side of its mouth, or pack feed in its cheeks. If the problem has been going on for a long time, the horse may start to lose weight.

The vet is able to sedate the equine dental patient, which can make the procedures safer for the clinician, the holder and, more importantly, the horse. Assessment of the incisors should be made before placing the mouth speculum.

Observation of the oral cavity with a speculum in place, and following adequate lavage, should proceed with a good light source, noting any obvious dental problems and assessing the soft tissues of the mouth for any concurrent lacerations, ulcers or swellings. Assessment of all aspects of the cheek tooth arcades can be achieved with a dental mirror, with the light source shone directly on to its surface. Palpation of the cheek tooth arcades is also very useful, as some subtle sharp enamel overgrowths can be overlooked by observation alone. Palpation of the teeth is also a good method of ensuring adequate reduction of enamel overgrowths during rasping.

Routine overgrowths

Feeding concentrate foodstuffs provides many of the horse's daily nutrients in a form that requires much less chewing and grinding than forage. Therefore, the domesticated horse spends much less time chewing and wearing down its cheek teeth than its wild counterparts and ancestors. In addition, the maxillary teeth are positioned more laterally than the mandibular arcade, which leads to enamel overgrowths on the buccal aspect of the maxillary teeth and the lingual aspect of the mandibular teeth ([Figure 5](#)). This is especially so with the increased chewing of concentrates, as less side-to-side grinding action is required than when fed forage.

Many horses will also have the maxillary teeth positioned further rostrad in the mouth than the mandibular teeth, which can lead to focal overgrowths of the upper '06 teeth and the mandibular '11 teeth ([Figure 6](#)), often known as rostral and caudal hooks, respectively. These overgrowths can cause lacerations and ulcers of the adjacent soft tissues, which can be painful when eating and when being ridden, especially if tight nosebands are employed (du Toit et al, 2008b). It is these overgrowths that are routinely reduced under direct observation and palpation with routine dental rasping.

Focal enamel overgrowths with concurrent ulceration and lacerations of the mouth are a common source of oral pain, which are alleviated by good routine reduction by rasping every six to 12 months. Regular examination can also allow other conditions to be noted early and, in some cases, monitored for development of clinical problems.

If the overgrowths are allowed to increase in size, they may become large enough to interfere with

the normal side-to-side movement of the teeth, and further exacerbate their development (Dixon et al, 2000a). This leads to a condition known as shear mouth and can result in occlusal angles of more than 45° (Brown et al, 2008), and is implicated in significant soft tissue trauma and periodontal disease.

Other abnormalities of wear

An undulating cheek teeth arcade can develop with disorders of cheek tooth eruption as a result of concurrent periodontal disease (Dixon et al, 1999a) or differential rate or normal dental eruption (Kirkland et al, 1996) and is often termed wave mouth. Step mouth can follow loss or removal of a cheek tooth or cheek tooth maleruption (Dixon et al, 2000a), with concurrent over-eruption of the unopposed opposite tooth/teeth.

Focal overgrowths can also develop when there are diastemata and worn infundibula or infundibular caries on the opposing arcades (du Toit et al, 2008a). If the overgrown tooth becomes large enough it can interfere with normal mastication. Loss of enamel ridges in geriatric patients leads to a condition known as smooth mouth, where the occlusal surface becomes smooth and loses its effectiveness in grinding – becoming worn more quickly (Dixon, 2002).

All these conditions are managed by reduction of the overgrowths, ideally before concurrent problems develop. If the overgrowths are significantly large then staged reduction, possibly with powered rasps, may be necessary to prevent iatrogenic damage to the pulpar tissue.

Diastemata

The equine cheek teeth should be tightly apposed with each arcade – providing one functional grinding unit, which is maintained by the angulation of the most rostral and caudal cheek teeth. In some cases, an interdental gap (diastema) can develop between adjacent teeth – usually of the more caudal mandibular teeth (Dixon et al, 1999b). Diastemata are also found between overcrowded medially or laterally displaced teeth and are commonly termed secondary diastemata (Dixon, 2006). Senile diastemata can occur as horses reach an age where eruption of the narrower apical end of the tooth results in similar gaps appearing between the teeth (Dixon et al, 2008).

Food material can be forced and impacted into diastemata and, in some cases, where the gap is narrower at the occlusal surface than gingivally ([Figure 7](#)), the food may not be readily evacuated. This is known as a valve diastema (Carmalt, 2003). Trapped food often begins to decay, leading to periodontal disease, and may eventually lead to more severe disease, such as pulpar infection or osteomyelitis of the alveolar and surrounding bones. A survey showed nearly 50 per cent of horses examined during routine dental examination had diastemata present, of which 40 per cent also had significant disease of the surrounding tissues (Dixon et al, 2014).

Some diastemata do not need treatment and may close as the horse ages. Others, however, may

require specific remedial dentistry, including cleaning and packing of the gaps, or further widening of the occlusal aspect, facilitating natural emptying of the food impaction, which will treat or prevent concurrent periodontal disease.

It is generally considered diastemata with significant periodontal disease is one of the most painful equine mouth conditions (Dixon et al, 1999b). Gingival recession with surrounding erythema should alert the suspicion of a clinically significant diastema. If these findings are present in a horse with clinical signs of oral pain it should be high on the list of differential diagnoses – especially if the signs have not resolved soon after routine enamel overgrowth reduction.

Pulpar disease

Disease of the pulp may often go unnoticed if there are no other clinical signs present, such as evidence of apical infection or periodontal disease. The pulp cavities are visible on the occlusal surface of the teeth and, with careful examination, disease of the pulps can be identified ([Figure 8](#)) as a “dulling” of the normally shiny black appearance and pitting of the secondary dentin covering the pulps when probed (Dixon et al, 2000b). They are a valuable indicator of tooth viability during investigations into suspected tooth root abscess. Dacre et al (2008a and b) found occlusal pulpar exposure in 23 per cent and 34 per cent of apically infected maxillary and mandibular cheek teeth, respectively.

Further investigation and management of pulpar disease will be discussed in a later article, but in cases without other clinical signs, the tooth can be left and monitored for advancing disease at future examinations. In other cases, further diagnostics and possible removal of the tooth may be necessary – especially if clinical signs of apical infection are present (such as facial or jaw swellings, draining tracts or sinus disease).

Dental caries

Caries is the destruction of calcified dental tissue by oral bacteria and occurs in a similar manner as in humans. In the horse, caries can be found on the sides of the teeth (peripheral caries; [Figure 9](#)), or more readily on the occlusal surface of the maxillary cheek teeth, in the infundibulum ([Figure 10](#); Dixon et al, 2000b). Infundibular caries are not always implicated in significant disease. However, deep cavities may weaken the tooth, predisposing it to fracture and the owner should be warned of this eventuality and advised to seek examination if the horse suddenly appears painful.

Caries can readily be observed on routine dental examination, especially in the ‘09 teeth (Fitzgibbon et al, 2010). Their significance depends on the extent of the lesion and if any other clinical signs are present.

Tooth fractures

Traumatic fractures of equine cheek teeth are uncommon (Dixon et al, 2000a) and it is usually the incisors that are more susceptible to damage from falls, kicks or mouth play behaviour (Dixon et al, 1999a). Cheek teeth fractures are usually idiopathic (Dacre et al, 2007; [Figure 11](#)). In some cases, they are secondary to other problems, such as infundibular caries or pulpar disease.

Loose fracture fragments or sharp edges may cause soft tissue trauma and oral pain when eating (Dixon et al, 2007), but more typically, these teeth are encountered when the smaller fragment has already been shed. If the fracture fragment is still present then food impaction in the fracture line can displace the loose fragment into the adjacent soft tissues. Common presentations are lateral slab fractures through the two buccal pulp cavities, and midline sagittal fractures through both infundibulae of the maxillary teeth. In some cases, the fracture exposes tooth pulps, potentially leading to pulpar and apical infection. The approach to management of fractured teeth varies widely, depending on the type of fracture, but further diagnostic techniques are often used to determine concurrent problems.

Immediate care of the fractured tooth should be aimed at alleviating pain caused by potentially displaced fracture fragments. This can include anti-inflammatory drugs and careful reduction of sharp fracture fragments to prevent soft tissue trauma until the diseased tooth can be suitably dealt with.

Conclusion

Dental care is a routine part of the equine veterinary surgeon's work and regular thorough dental examination, often using sedation, allows problems to be identified before they become clinically significant.

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Figure 1. A long-handled, straight positioned blade.

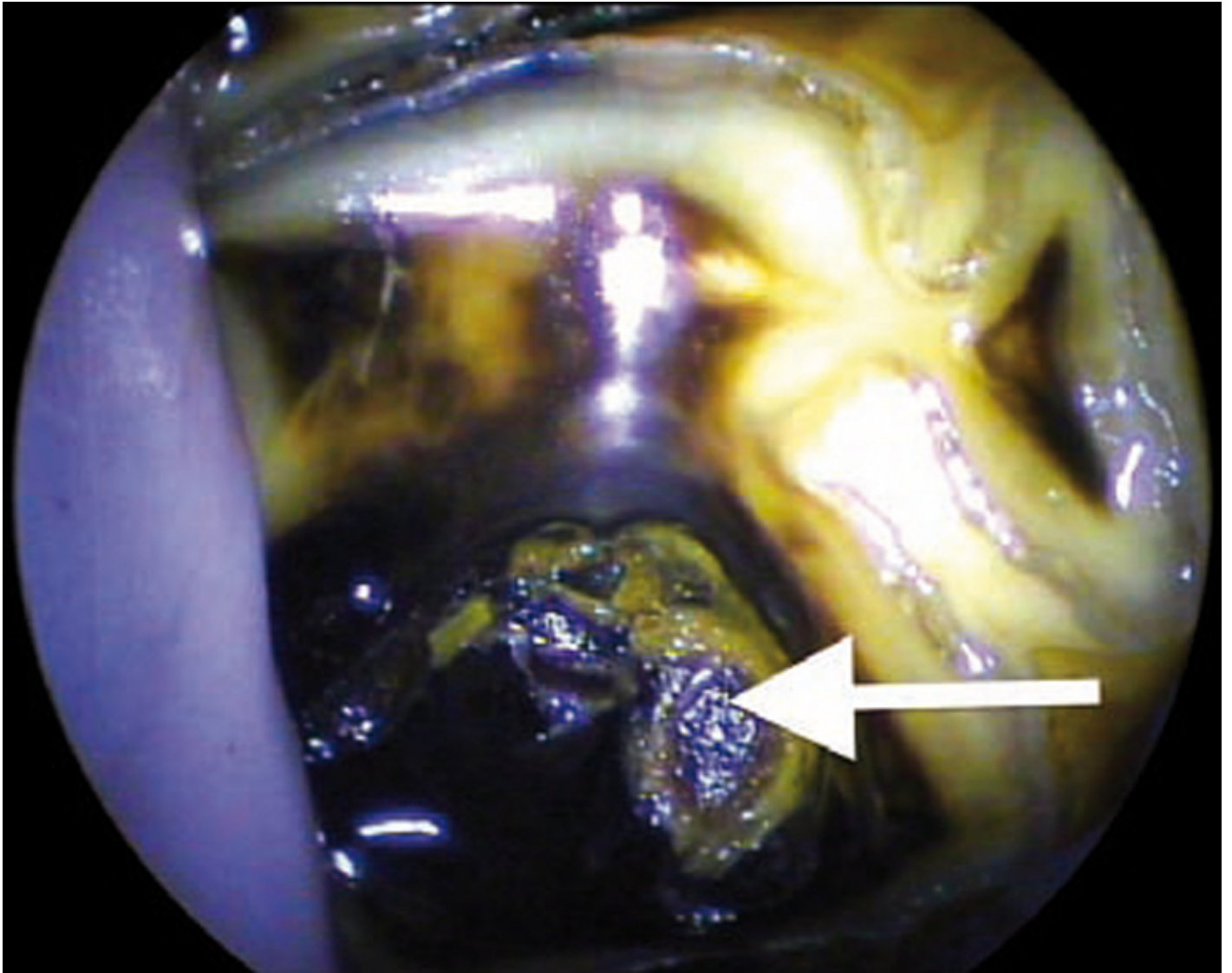


Figure 10. Infundibular caries of the maxillary teeth (arrow) with food material pocketing within.

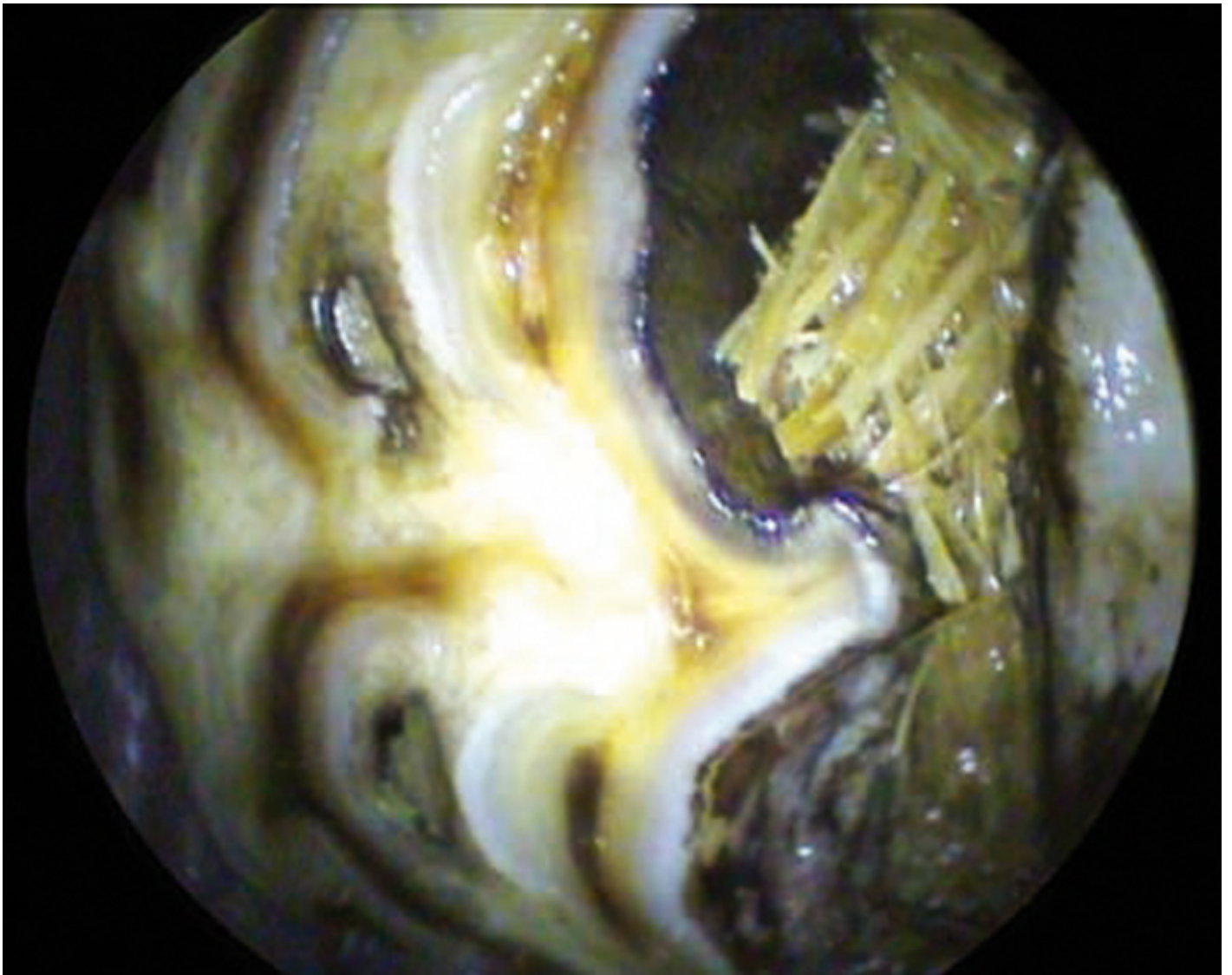


Figure 11. A lateral slab fracture of the cheek tooth on the right of the picture, with food material pocketing into the fracture gap.



Figure 2. A long, upturned-headed rasp.



Figure 3. A shorter-handled, downturned head rasp.



Figure 4. The Gledhill rasp used on the mandibular arcade.

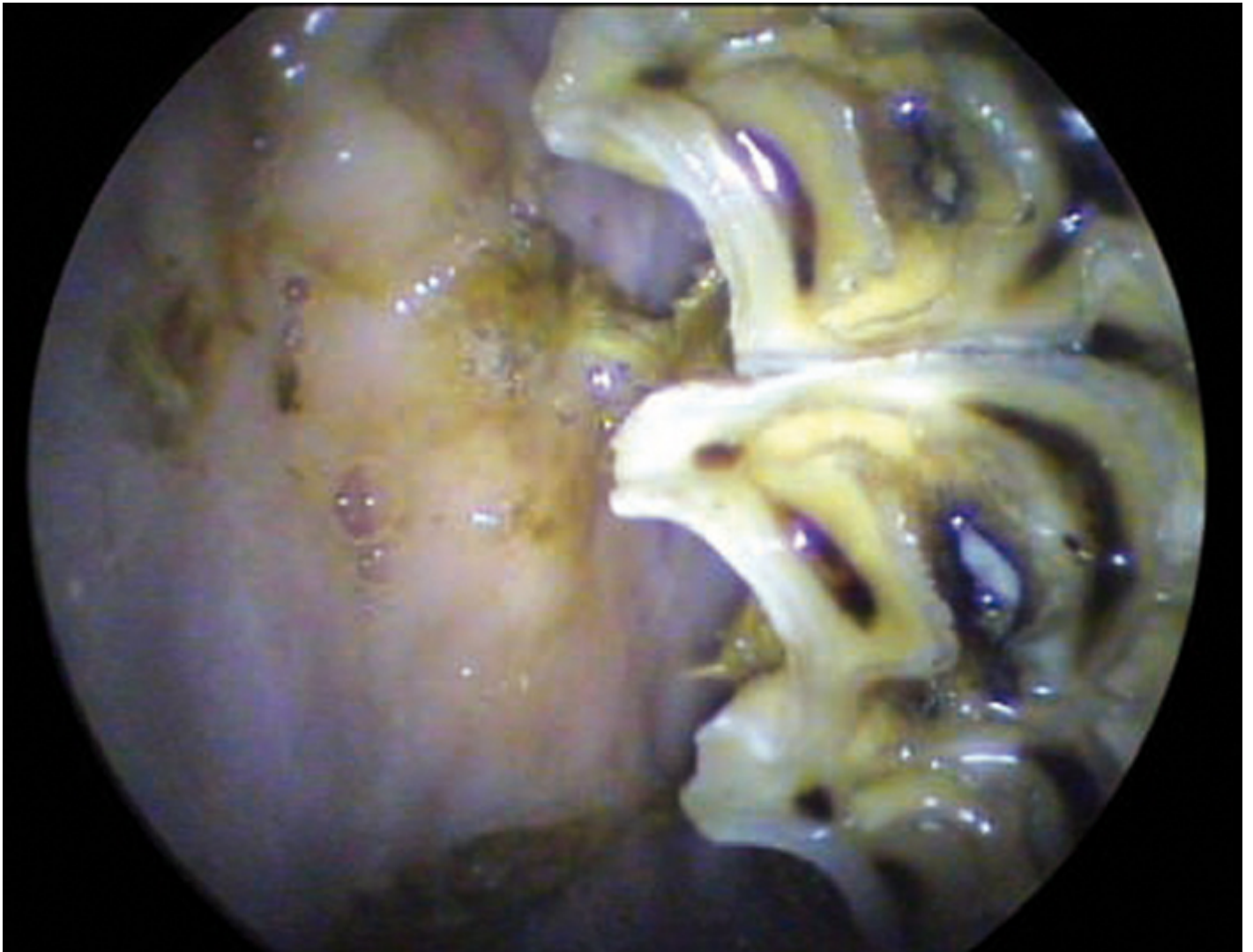


Figure 5. Sharp enamel overgrowths on the buccal aspect of the maxillary teeth.



Figure 6. A severe rostral hook on a 106 tooth.

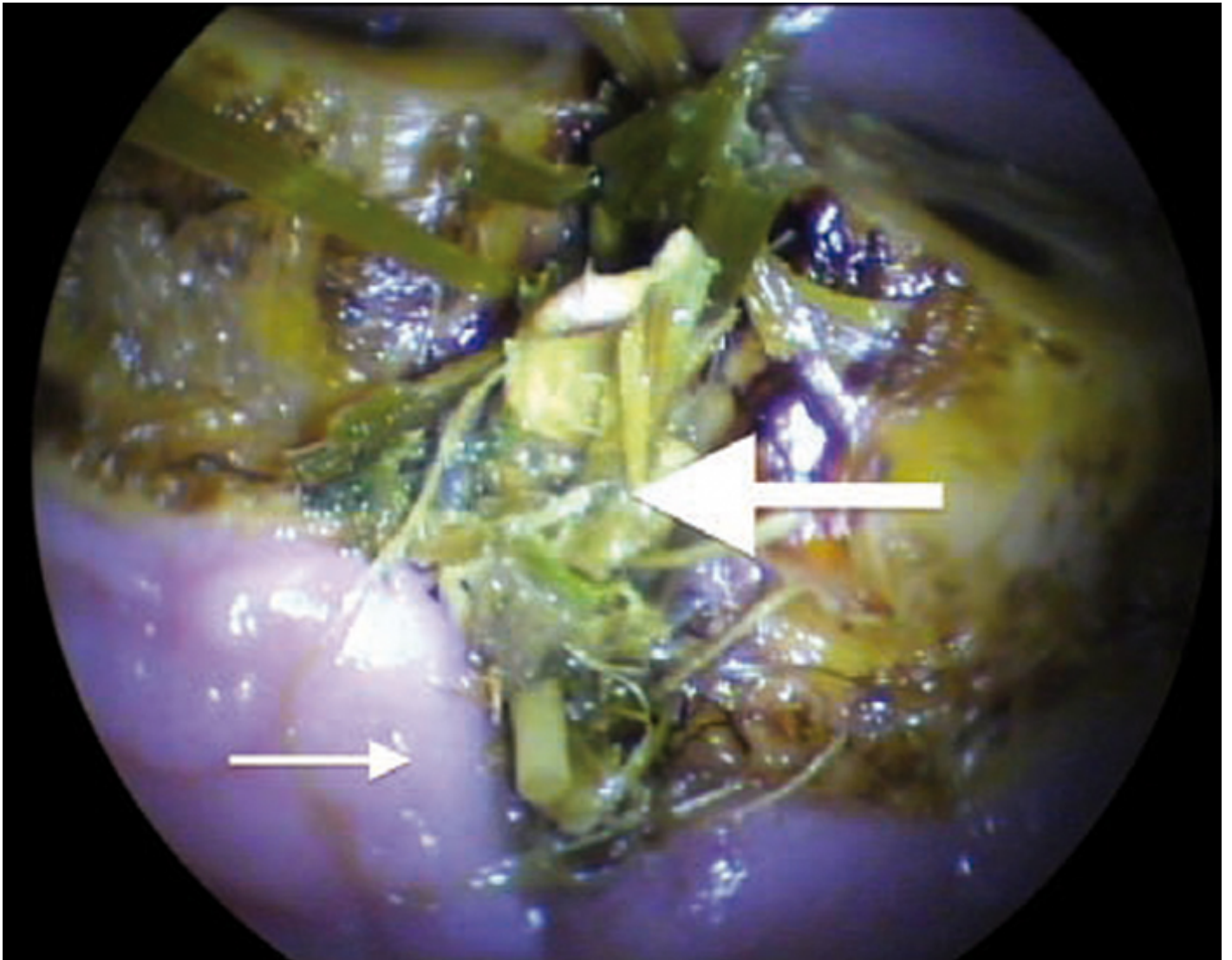


Figure 7. A mandibular tooth diastemata with food pocketing (large arrow) and recession of the

gingiva (small arrow).

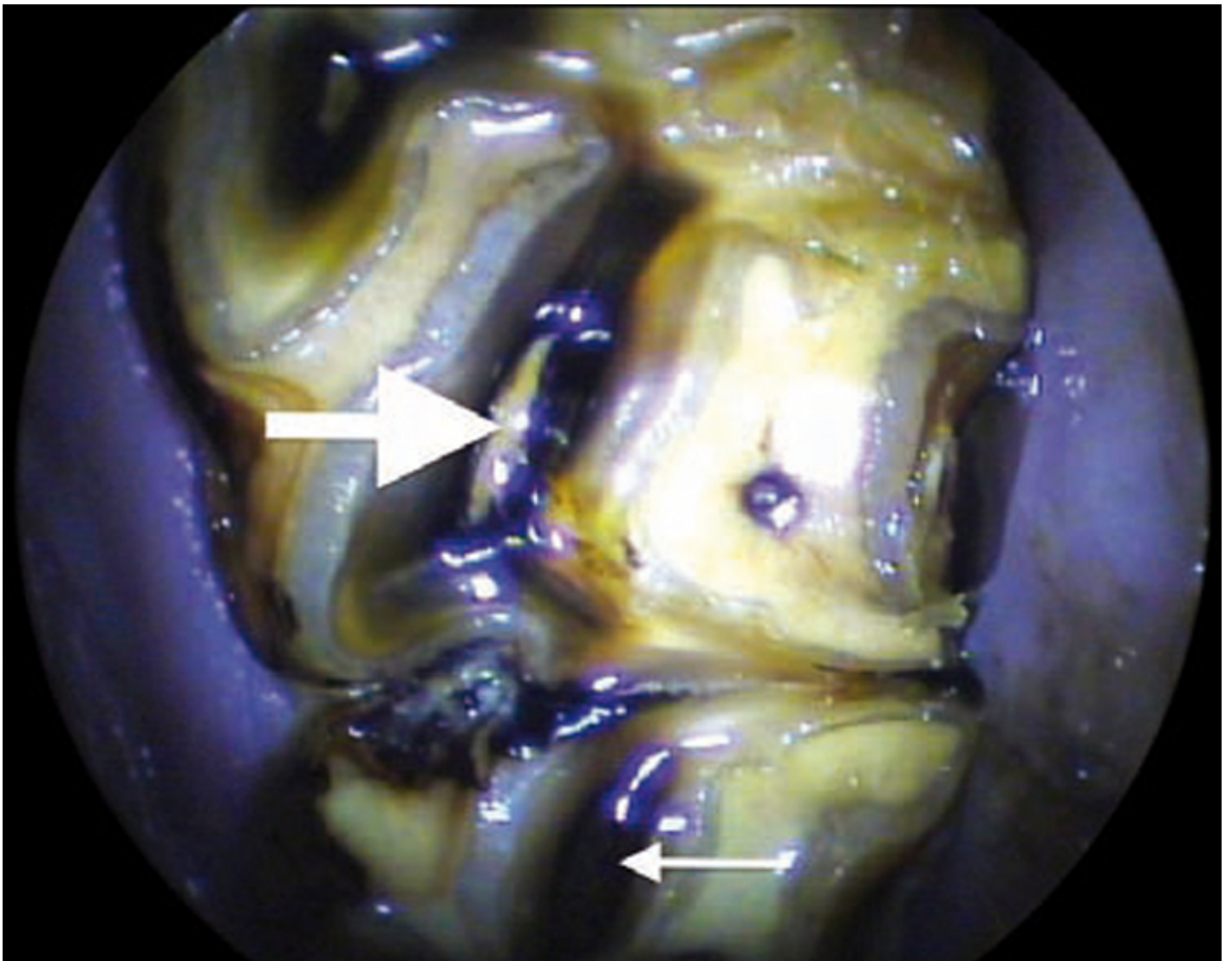


Figure 8. Exposure of the pulp – the exposed pulp is shown by the large arrow – with the yellow centre. Compare this to the adjacent black and shiny ones (small arrow).

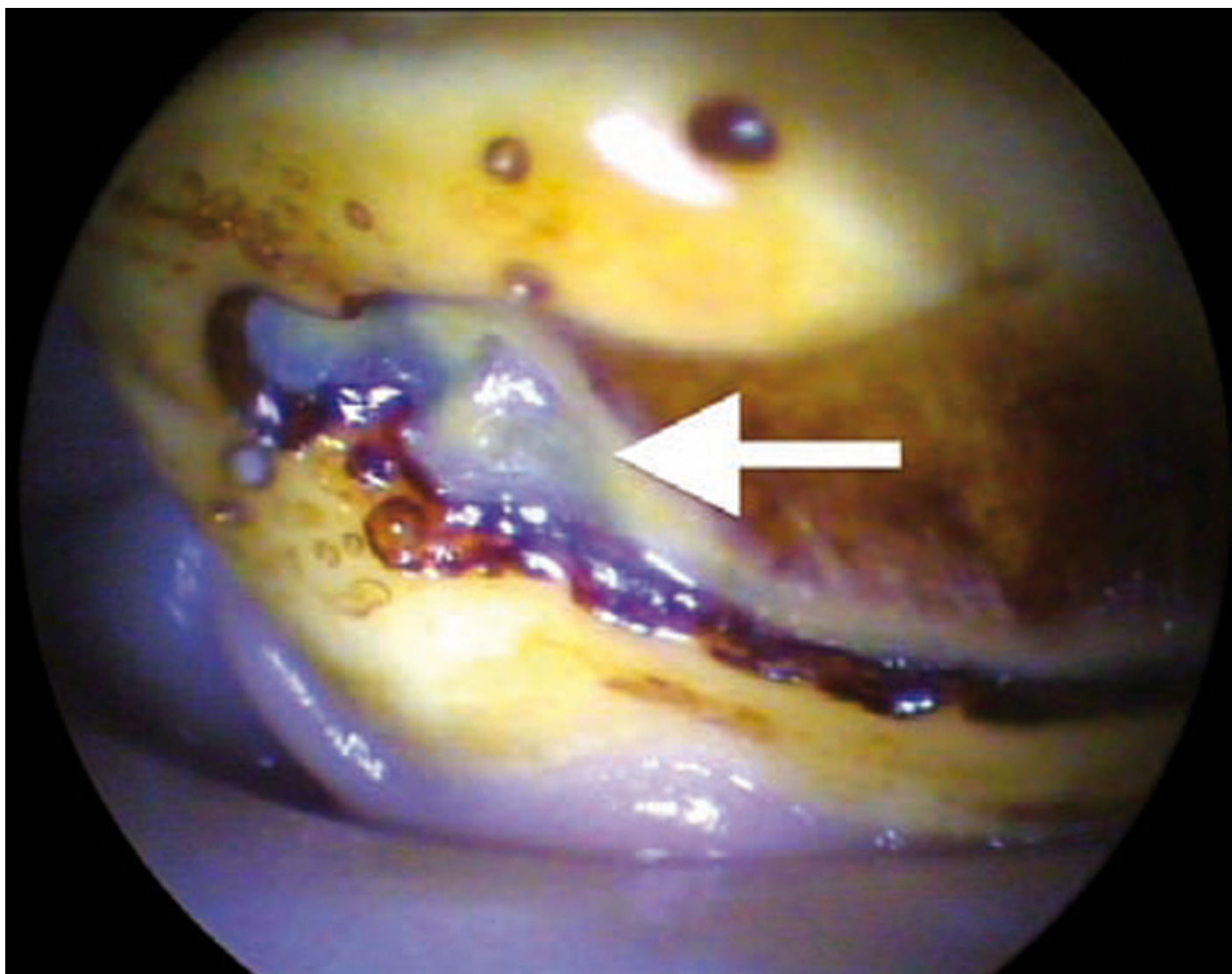


Figure 9. Peripheral caries on the caudal mandibular teeth (arrow) where the outer layer of the tooth is lost, potentially exposing deeper tissues.