

Surgical Removal of Mandibular Periostitis (Bone Spurs) Caused by Bit Damage

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Surgical removal of mandibular periostitis is a simple procedure that can be performed as a standing surgery in the field. With proper case selection, of horses suffering from active mandibular periostitis, this surgical procedure can greatly increase comfort when the horse is ridden with a bit. Author's address: Advanced Equine Dentistry, 6101 Katz Road, Grass Lake, MI 49240. © 2002 AAEP.

1. Introduction

Many performance horses suffer from painful mandibular periostitis caused by bit trauma. Periostitis and resulting bony callus formation can cause severe pain when the bit contacts the damaged area. The area most often affected is the interdental space between the corner incisor and the second premolar (Fig. 1). Occasionally the upper interdental space on the maxilla may be involved. Surgical removal of the affected tissue can alleviate many of the behavioral signs of discomfort as the horse responds to bit contact.

Most horses with mandibular periostitis are performance horses ridden with a large amount of bit contact. Inexperienced or overzealous hands can result in damage to the mandibular bone. Frequently affected horses include the following: dressage horses, gaited horses, western working horses, Standardbred and Thoroughbred race horses, gaming horses, and polo ponies.¹ Other causes of injury include a horse stepping on its rein, a horse being tied around to itself from the bit, and damage from numerous types of biting rigs.

Horses often exhibit behavioral signs related to avoiding bit contact when being ridden. Horses will avoid the bit by going "behind the vertical," or by flipping their head so the rider releases contact. Some horses bear into the pain, whereas others will hang their tongue out of the mouth, protecting the side that is most painful. Palpation of the interdental space may elicit a painful response.

Conformation of the interdental space varies between horses. Some horses have thick, round bars. Other horses have razor thin, narrow bars. The thin, tall bars are more subject to trauma. When examining the interdental space, one should palpate each side at the same time to compare symmetry. Active periostitis will palpate as a soft and thickened raised area, generally with soft tissue edema and possible erosion to the mucosa. Horses may react violently as the sensitive area is palpated. Inactive periostitis will palpate as a hard bony callus covered with a thin layer of mucosa. Damage resulting in bone sequestra will often have a draining tract visible in the oral cavity, and a foul odor may be present. Differential diagnosis includes lower jaw impacted wolf teeth, mandibular fracture, foreign body, and aberrant tooth bud.

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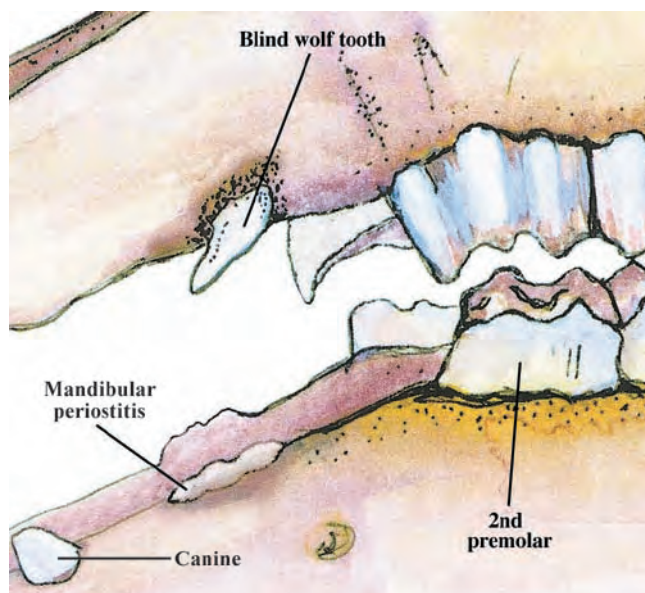


Fig. 1. Location of mandibular periostitis.

2. Materials and Methods

Diagnosis relies primarily on obtaining a complete history from the rider and palpation of the interdental spaces. Additional diagnostic techniques include radiographs, scintigraphy, computed tomography,² and diagnostic nerve blocks. Having the horse ridden without a bit can also help in the diagnosis. Radiographs should include straight laterals and oblique laterals. A ventral to dorsal radiograph with the plate in the oral cavity can also be helpful. The tongue should be retracted out of the way with a piece of gauze because of the possibility of its density hiding the less dense periostitis. Scintigraphy can show increased uptake within the interdental space. A diagnostic mental nerve block can be performed (Fig. 2). The mental foramen is

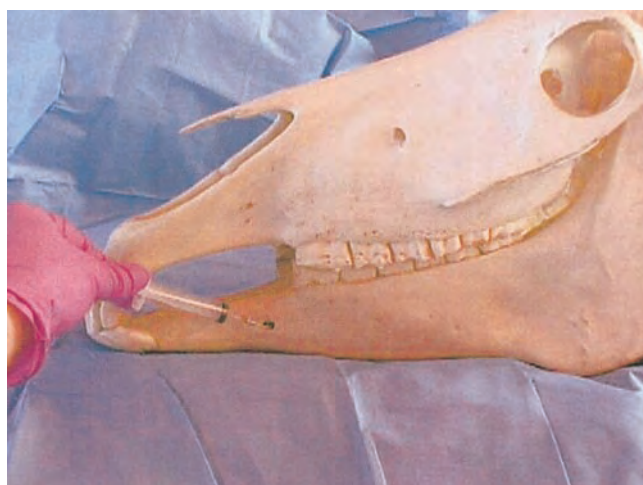


Fig. 2. Mental nerve block.



Fig. 3. Bone spur location rostral to second premolar.

located laterally on the mandible midway between the corner incisor and the second premolar. A surgical scrub is applied over the lateral aspect of the mandible. A twitch is applied, and one thumb is placed over the mental foramen to locate the foramen and guide a 20-gauge 1.5-in needle into the foramen. The needle is inserted 1 cm rostral to the foramen. A bleb of local anesthetic is injected at the entrance of the foramen, and the length of the needle is inserted into the canal in a rostral to caudal direction. The thumb positioning the needle is used to occlude the foramen, and 3 ml of 2% carbocaine is injected into the foramen.

Sedation is performed with detomidine HCl (10–20 $\mu\text{g}/\text{kg}$, IV). A full mouth speculum is inserted into the mouth. A thorough oral exam should be performed, including visualization and palpation of the entire mouth, aided by the full mouth speculum. Evaluation of the soft tissues should be performed with particular attention to ulcerations or scars involving the tongue and soft tissues close to the bit area. Proper rounding of the second premolars ("bit seats") should be evaluated. If a diagnostic nerve block was not performed, a mental nerve block should be performed preceded by a sterile prep. Surgical gloves should be worn for cleanliness.

Instruments needed for the procedure include a no. 12 hooked scalpel, osteotome, mallet, bone file, long Kelly forceps, and bone rongeurs. An assistant can hold the tongue outside the contralateral side of the mouth (Fig. 3). One thumb is used to retract the soft tissues laterally, and a curvilinear incision is made with the hooked blade to the lateral side of the affected tissue down to the mandibular bone, extending 1 cm rostral and caudal to the abnormal tissue (Figs. 4 and 5). An osteotome is placed on the normal bone rostral to the periostitis (Figs. 6 and 7). The mallet is then used to gently tap the osteotome and elevate the periosteum and

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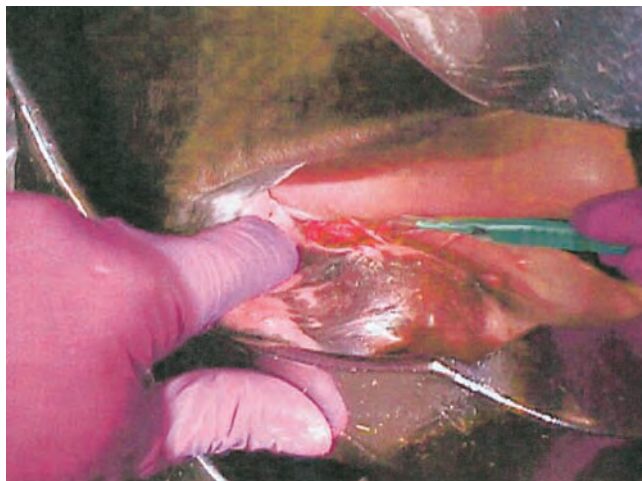


Fig. 4. Curvilinear incision lateral to periostitis.



Fig. 6. Osteotome position rostral to bone spur.

bony callus away from the normal bone (Fig. 8). A Kelly forceps is used to grasp the soft tissue containing the elevated scar tissue. The curved blade is inserted caudal to and below the forceps and pulled rostrally along the top of the mandible to remove the elevated tissue (Figs. 9 and 10). Care must be taken not to lacerate the tongue or frenulum under the tongue. The fragile frenulum tissue may tear if care is not taken. A bone file is then used to reduce high areas and sharp edges (Fig. 11). The affected area should be level with the normal bone in front of and behind the lesion (Fig. 12). Often the bone has been rolled over the lateral side of the mandible by the bit. Care should be taken to remove the excess bone and tissue from this lateral aspect of the mandible. Bone sequestra should be removed in a similar manner and surrounding tissues debrided. The incision is left open to heal by second intention. On a tractable horse, owners may flush the incision two times a day with warm

salt water (2 Tbs. NaCl added to 8 oz water) for 10 days. A fermenting type of odor may occur if feed becomes trapped in the incision. Horses are placed on trimethoprim/sulfa, 15–30 mg/kg, q 12 h, PO, for 7 days.

3. Results

In most horses, the incision is completely healed within 6–8 wk, leaving mucosa over smooth bone. While healing, the mucosa will be quite edematous and thickened. Encourage the owner to ride the horse within 3–5 days *without* a bit, using a hackamore or bitless bridle. This allows the horse and rider to feel what it is like to communicate without pain. Recheck the horse between 6 and 8 wk and reintroduce a bit 6–8 wk after surgery, provided proper healing has occurred.

I have performed this procedure on 76 horses with excellent results. According to owners, the horse is almost immediately more comfortable with the bit.

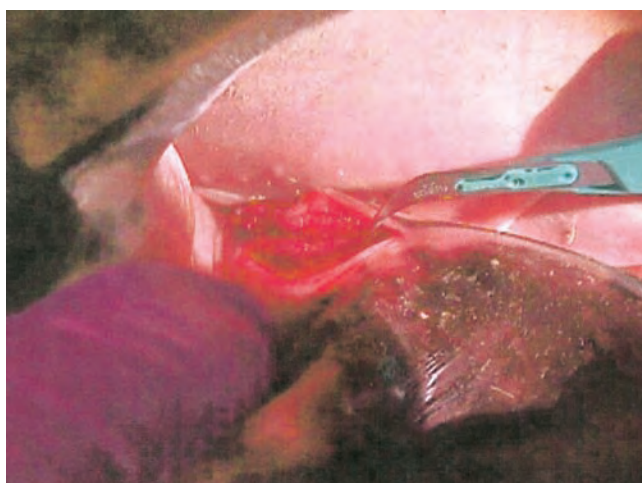


Fig. 5. Exposed periostitis and bony callus.



Fig. 7. Osteotome position before elevating.



Fig. 8. Elevated bony callus.



Fig. 10. Exposed bone after removal of periostitis.

Most riders feel the horse gradually becomes more comfortable and accustomed to contact over several months. Most horses stop pulling at the bit or flipping their head to decrease contact. Horses are visibly more accepting of contact on the bit and will actually reach for the bit rather than elude contact. In 74 cases, the owners felt that their horses improved dramatically after surgery. Two horses have had a recurrence of the periostitis and required additional surgery.

4. Discussion

Case selection is very important. One should consider the intended use of the horse, the rider's ability, and the rider or caretaker's compliance. If the horse is a retired dressage horse now being used as a trail horse, surgery may not be necessary. If the rider is not compliant and does not realize why the damage has occurred, the perios-

titis may reoccur again soon after surgery. Horses are much more comfortable after removal of an active periostitis because of removal of the inflamed and irritated innervation. As long as the reason for the damage is eliminated and the damaged tissue removed, the horse will gradually forget about the previous pain. Advise owners that the horse may never be as comfortable with a bit as they would have been if the damage had never occurred. A bit that has less contact on the bars is beneficial. A French link type of snaffle provides more tongue pressure and less bar contact. A low port or a Mullen mouth curb bit also provides more tongue contact and less bar pressure.

In cases where the incision has been sutured, the healed scar is much less desirable, with thickened mucosa and bumpy scar tissue. The disadvantage to this surgery is the 6- to 8-wk period without a bit. This surgery is generally per-



Fig. 9. Removal of periostitis with no. 12 scalpel and Kelly forceps.

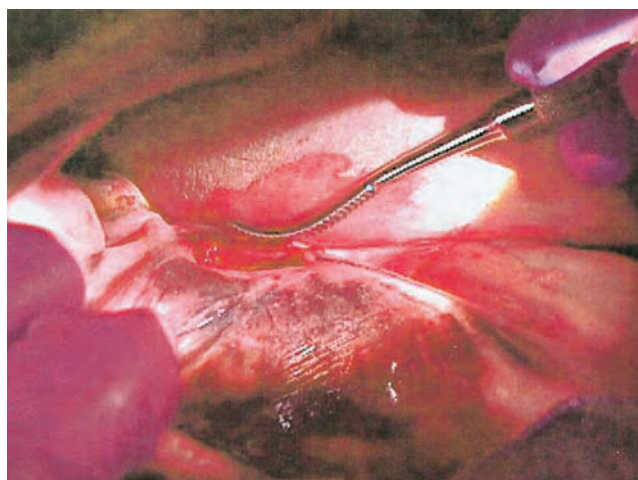


Fig. 11. Finishing surface with bone file.

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Fig. 12. Periostitis and bony callus removed and bone level with surrounding normal bone.

formed in the off-season or when a horse is laid up for another reason. It is beneficial to both the horse and rider to have a 6-wk period of work under saddle without a bit.

This surgical procedure is simple to perform, can be performed as a standing surgery, and requires basic surgical instrumentation. It is a procedure that the general equine practitioner can perform in the field. The procedure has low risk of complications. Horses and riders can greatly benefit from the comfort enabled by surgical removal of mandibular periostitis.

References

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2. Tietje S, Becker M, Bockenhoff G. Computed tomographic evaluation of head diseases in the horse: 15 cases. *Equine Vet J* 1996;28:98-105.