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Repulsion of Cheek Teeth

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symptom noted was an icterus of the visible mucous membranes attributed to chloroform intoxication of the liver. The patient continued to an uneventful recovery from the surgery.

Microscopic section of the removed organs revealed about one-third of the tissue to be seminiferous tubules, the other two-thirds being made up of interlobular and intralobular connective tissue and interstitial cells. Cells of the tubules consisted of spermatogonia or spermatocytes. No spermatozoa could be seen. Rarely could mitosis be seen in the spermatogenic cells. The cells of Sertoli were scanty. No evidence of ovarian structure could be found in any of the tissues sectioned.

It can be logically concluded that the presence of testicular tissue accounts for the symptoms shown. It is not known whether removal of the tissue will effect a recovery.

—Philip C. Peterson, '43

4 Repulsion of Cheek Teeth. The pleasure or luxury horse is rapidly coming into the picture. With the coming of this city-kept and fed horse by owners who know very little about feeding and caring for horses, troubles are inevitable. Disturbances of nutritional origin will make their appearance and, in fact, have already made their appearance.

Among these troubles may be listed alveolar periostitis. Not all cases of alveolar periostitis, however, are due to nutritional deficiencies, although it is probably the largest single contributing factor. Records at the Stange Memorial Clinic at Iowa State College show that there was a sharp rise in these cases following the drought years of 1934 and 1936. Reports from men acquainted with livestock problems of other parts of the country indicate that the condition may have a geographical relationship which also points to nutritional deficiency. Infection introduced to the roots of the teeth is also a common cause of alveolar periostitis. Other causative factors are split or cracked teeth, injuries to the gum, and fractures of the jaw bone. By far the most common direct cause is failure of one of the central canals of the teeth to close. This indirectly is probably due to a nutritional factor, an inheritance factor, or both.

Occurrence

Any cheek tooth may be infected, but for some reason, still unknown to science, the fourth upper tooth is by far the most commonly affected. Records kept by Dr. Bemis while at Iowa State College showing the incidence of the condition for each tooth are shown below.

<table>
<thead>
<tr>
<th>Tooth</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st cheek</td>
<td>10%</td>
</tr>
<tr>
<td>2nd cheek</td>
<td>21%</td>
</tr>
<tr>
<td>3rd cheek</td>
<td>21%</td>
</tr>
<tr>
<td>4th cheek</td>
<td>34%</td>
</tr>
<tr>
<td>5th cheek</td>
<td>12%</td>
</tr>
<tr>
<td>6th cheek</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

There are two forms of the disease, one being acute suppurative and the other chronic ossifying periostitis. Most cases occur in animals between the ages of 2½ and 8 years. The onset is probably gradual but the process is not apt to be noticed until the final stages when the symptoms alarm the owner. The disease process then increases rapidly and the symptoms become progressively more severe. Symptoms that may be noted are cautious mastication, carious odor, painful swelling of the mandible or maxilla in the region of the affected tooth, and a unilateral nasal discharge from the affected side. There may be a partial fracture of the tooth, recession of the gums, looseness or displacement of the tooth, and generally an empyema of the sinuses according to the location of the tooth. The fingers should be passed along the lateral surfaces of the teeth between the teeth and cheek to discover displacement of teeth or splitting and displacement of the lateral half only.

Young Horses Affected

Since the condition occurs most often in young horses while the teeth are still long, extraction is usually difficult to accomplish. Repulsion then must be resorted to. A discussion of the generally accepted procedure for repulsion follows.

Proper anesthesia, for which chloral hydrate combined with local anesthesia is

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very effective, is imperative. Chloral hydrate given through the stomach tube at the rate of 1/2 oz. per 500 lbs. body weight is used as a basal narcotic. The instruments for the operation may be prepared during the 15 to 20 minutes required for absorption of the drug. The horse is then led to the site where he is to be cast. To complete anesthesia, chloral hydrate is used intravenously, 3 oz. dissolved in 500 cc. sterile physiological saline which is sufficient for the average sized horse. The casting harness is put on the horse, after which intravenous injection is begun. When the knees start to buckle and the patient begins to weave, anesthesia has progressed sufficiently for the horse to be cast.

**Local Anesthesia**

If an upper tooth is involved, the next step is to block the infraorbital nerve. The location of this nerve is described very well by Sisson: “The infraorbital nerve gives off alveolar or dental branches. The posterior branches pass through small foramina in the tuber maxillare and supply the posterior teeth and maxillary sinus. The middle branches are given off in the infraorbital canal, and constitute the chief nerve supply to the cheek teeth and maxillary sinus.”

A sufficient amount of anesthetic to block the sensory impulses should be injected directly upon the nerve where it enters the maxillary foramen with a hypodermic syringe and a 4-inch, 20-gauge needle. Two per cent procaine is the agent of choice, 5 to 8 cc. are sufficient.

For injection of the nerve, select a point on the side of the face opposite the lateral canthus of the eye and just below the facial crest. The area is shaved and painted with tincture of iodine. The skin is penetrated with a sterilized needle and the point directed medially and slightly anteriorly so that it will follow the zygomatic process and drop into the pterygopalatine fossa. The needle is pushed until it strikes the palatine bone. This area is infiltrated with 5 to 8 cc. of procaine solution.

The site of the operation is shaved and the skin painted with tincture of iodine. The proper location of the trephine opening is established by a line of maximum height at which any trephining may be done. This is a line passing from the medial canthus of the eye to a point just superior to the infraorbital foramen and continuing forward past the roots of the first tooth. This marks the position of the osseous lachrymal canal which must be avoided in operating. Trephine openings should be placed just below this line of maximum height. The opening is so placed that it is directly above the root of the tooth to be repelled so that the punch may be driven in the direction of the long axis of the tooth. It must be remembered that the roots of the cheek teeth of the horse curve slightly backward, hence to allow for this curve, the trephine opening should be made over the posterior border of the table surface of the tooth to be repelled.

For the repulsion of the sixth superior cheek tooth it is necessary to go through the frontal sinus, on a plane taken between the medial canthi of the eyes and at a point one and one-half inches from the median line on the side of the affected tooth. A curved punch is passed through the trephine opening into the fronto-maxillary opening, then lateral to the infraorbital canal to the root of the tooth. Fortunately the sixth tooth is seldom involved.

**Trephining**

Having decided on the point to be trephined, anesthetize the skin and periosteum with 2 per cent procaine. With a sharp scalpel remove a circle of skin and tissue about one inch in diameter down to the periosteum. Divide the periosteum and push it off of the bone over the entire area. Trephine the bone using a seven-eighths inch trephine. Place the punch squarely on the root of the offending tooth. The operator should direct the punch with one hand and keep the fingers of the other hand on the table surface of the tooth to be repelled. The assistant drives the punch, using well-timed blows of good
Position of punch in relation to tooth.

force. The final repulsion is done by the operator pushing upon or tapping with the punch. If the horse is young and the tooth extremely long it may be necessary to cut off a portion of the tooth to prevent striking the opposite tooth.

After the tooth is removed, the alveolar cavity should be searched for remaining portions as well as for loose pieces of bone and infected granulations, all of which should be removed with a curette. During the operation the horse’s head should be lower than the remainder of the body or a sack should be placed under the neck to prevent inhalation of exudate and blood.

Wound Treatment

The cavity should be packed with a roll of gauze. To secure the pack tie around its center a piece of umbilical tape, leaving the ends even so that both ends of tape may be carried up through the trephine opening. Another roll of gauze is then laid between the two ends of tape which emerge from the opening and is held in place by a knot tied in the tape. Such a dressing will prevent dirt entering the trephine opening and hay and grain entering the alveolus. During the first few days following the operation renew the dressing daily. New tape can be drawn in by tying the ends to the old before it is removed. After granulations have started the cavity may be permanently plugged with dental impression wax. Such a plug will remain in place until it is gradually displaced by the healing process, by which time the communication with the sinus will have been closed.

The trephine operation invariably, barring accidents, heals until it is hardly noticeable and it is necessary then to merely return once a year to cut off the opposite tooth as it grows down into the vacant space.

REFERENCES

2. H. E. Bemis, 1933, Veterinary Surgical Operations.

Paraphimosis in Equine. Paraphimosis is a condition in which the glans of the penis cannot be withdrawn into the prepuce. The condition is probably more common in the horse than any other domestic animal with the possible exception of the dog.

The causes of paraphimosis can be either inflammatory or non-inflammatory and may occur in animals debilitated by severe infections, febrile diseases, parasitisms, or influenza. Senility in stallions may be responsible for the condition, as may be paralysis of the retractor muscles following injuries of the posterior spinal cord. Tumor formation either of benign or malignant type may cause the penis to become too large to be withdrawn into the sheath. The most common cause is injury to the penis or preputial folds. Such injuries may be caused by false copulation in which the penis strikes the pelvis of the female, striking with a whip, or kicking.

Treatment

The most common method of treatment in the many cases which have been brought to the Iowa State Veterinary Clinic is amputation. In the case of stallions other treatments have been attempted but recovery is rather infrequent. Such treatment consists of wrapping the penis from the distal to the proximal end very tightly to reduce edema. The organ is subsequently bathed with hot or cold applications. In any event the penis should be supported by a sling to prevent further injury and edema. An edema of long