GGP STATE OF THE ART STREAM: DENTISTRY

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A PRACTICAL APPROACH TO MANDIBULAR FRACTURES AND TMJ-INFECTIONS

Mandibular fractures are the most frequently diagnosed fractures of the equine head. Furthermore, they are one of the most encountered fractures in horses. Causes include blunt trauma, kicks from other animals and a violent pull back escape attempt while cribbing on stationary objects.

Time-period between trauma and presentation will differentiate between acute-, subacute and chronic fractures. Clinical signs include oral haemorrhage, variable soft-tissue swelling, incisor malalignment, discomfort, salivation, halithosis and unwillingness to eat. Protrusion of the tongue may indicate a bilateral fracture of the mandible.

Diagnosis of rostral mandibular fractures is often straight forward and usually based on oral examination alone. Radiographs may provide additional information. More caudally located fractures require a thorough physical examination of the mandible. Palpation and manipulation may differentiate between stable and unstable fractures. In such cases, radiographic examination is very useful for an accurate diagnosis and correct treatment selection. Surgical repair is warranted when fractures are unstable, moderately displaced, bilateral, cause malalignment, or inability to eat or drink and when cosmetic outcome is important.

The aim of surgical repair is to immobilize the fracture fragments, to obtain anatomic restauration including bite alignment and to reduce convalesce time. Good vascular supply, due to sufficient soft tissue coverage, and low-to-moderate loading forces benefit fracture healing and surgical outcome.

Fracture types amenable for standing surgery are simple quadrant fractures through the incisor alveolar plate, simple interdental space fractures and symphysis fractures.

Surgical equipment consist of:
- different sized curettes
- sterile saline solution
- 14 G needles
- 0.7-1.25 mm stainless steel cerclage wire
- wire plier/cutter
- light source (headlamp)
- Jacobs chuck, Steinmann Pins
- (hand drill, drill bit)

Patient preparation consists of sedation with detomidine and butorphanol, check of the vaccination status, NSAIDs and antibiotics. The rostral mandible is desensitized by blocking the mandibular branch of the trigeminal nerve. This can be carried out where this nerve exits the mental foramen or, more caudally, where it enters the mandibular foramen at the medial surface of the vertical ramus of the mandible. A spool speculum or section of PVC tubing placed between the cheek teeth improves access to the oral cavity. The mouth is rinsed with water to remove accumulated feed material, followed by careful curettage and debrided of the fracture line. All food material, clotted blood and bone fragments should be removed. Debridement reduces bacterial contamination and facilitates fracture reduction. Loose elements should always be preserved.
Fixation types and methods for treatment of rostral mandible fractures are widely variable. Nevertheless, one should follow the basic principle: Keep it simple. This usually involves the application of intra-oral wires.

The cerclage wire will be applied in such way that the fractured part is fixed to the adjacent healthy part. Two or more cerclage loops are often necessary to achieve a stable fixation. The canine tooth, when present, can be used as an anchor point. In absence of such, a drill hole in the lateral edge of the interdental space can be made using an orthopaedic drill or hand chuck. The wire can be passed through the drill hole and looped around the fractured part. Special care should be taken to avoid damage to the mental nerve. Also the second premolar (Triadan 306/406) can be used as an alternative anchoring spot.

Postoperative NSAIDs and, in some cases, antibiotics are considered routine. Furthermore, postoperative management consists of daily lavage of the oral cavity, daily check of the implant and feeding the horse a soft diet. Avoid grazing and packed hay-nets the first 3 weeks.

Implants are routinely removed on the sedated horse, 6 to 8 weeks after surgery. The most common complications include implant loosening leading to fracture instability, infection, bone sequestration, gingival stringing and malocclusion. Nevertheless, overall outcome is favourable to good.

TMJ INFECTIONS

Septic arthritis of the temporomandibular Joint (TMJ) is relatively uncommon in horses. As in humans, infection of the TMJ usually results from head trauma. Iatrogenic and haematogenic causes of synovial joint infection have also been described in literature. The TMJ consists of a diarthrodial joint with an intra-articular fibrocartilaginous disc. This disc or meniscus separates the discotemporal- (DTJ) and discomandibular joint (DMJ). There are two collateral ligaments (lateral and caudal). The transverse facial artery, vein and nerve course lateral and in close proximity to the DMJ.

Following all synovial infections, septic arthritis of the TMJ can be divided into an acute, subacute or chronic stage. Diagnosis of a septic TMJ is usually based on physical examination, radiographic examination and arthrocentesis.

Physical examination consists of a complete external inspection, palpation and a profound dental examination. Clinical signs may include moderate to severe focal swelling, presence of a wound, purulent drainage, inability to eat, increased body temperature and aberrant wear of the incisor and cheek teeth.

Radiographic examination of the TMJ can be challenging. Especially the tangential view requires some practise and expertise. With radiography, mainly the lateral part of the TMJ is visualized. Nevertheless, comparison of the diseased and unaffected TMJ may facilitate in diagnosis and treatment choice. Ultrasonography of the TMJ provides essential information about the intra-articular disc and surrounding soft tissue structures.

Compared to radiography, Computed Tomography (CT) examination results in a complete assessment of the TMJ.

Arthrocentesis of the TMJ can be easily performed. Using an aseptic technique, a 20G 1.5 inch needle is advanced in a 15° ventral to 15° rostral direction into the caudodorsal pouch of the DTJ. The synovial sample is submitted for macroscopically and microscopically analysis.
Acute and subacute TMJ infections without obvious subchondral involvement can be treated medically by systemic or IA antibiotics or surgical by arthroscopic debridement, nettoyage and lavage.

In more chronic and destructive TMJ infections, a surgical intervention is warranted. Arthroscopy of the TMJ (DTJ and DMJ) in healthy horses allows visualization of the lateral compartment only. Therefore, with particularly lateral localized subchondral bone disease, a minimal invasive (lateral) condylectomy technique may be selected. On the other hand, with mainly medial located or generalized subchondral bone disease, a partial to complete condylectomy technique should be selected. Following the condylectomy procedure, the meniscus can be removed. Meniscectomy however, is thought to lead to ankyloses formation in humans. In two case reports, formation of a pseudocondyl was reported after a partial and a complete mandibular condylectomy when combined with meniscectomy.

Literature concerning treatment and outcome of septic arthritis of the TMJ is limited and frequently based on single case reports. Acute to subacute TMJ infections, without obvious subchondral bone disease, may have a favourable prognosis after arthroscopic debridement and lavage.

Condylectomy is generally considered a salvage procedure, but individual excellent cosmetic and longterm outcome have been reported.