Management of fractures of the olecranon in horses

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Fractures of the olecranon process of the ulna are one of the most common proximal limb fractures of young horses and are probably the most amenable to surgical repair. Overall there is a good prognosis for recovery with appropriate management and most horses will have a productive career.

Most olecranon fractures are associated with external trauma such as a kick injury or they may occur from falling. There are often signs of a kick or an open wound which may be in direct contact with the fracture. Variable degrees of soft tissue swelling are present. Clinically there is a characteristic “dropped elbow” which is associated with functional loss of the triceps brachii apparatus and an inability to extend the carpus. Pain is present on palpation and flexion of the elbow. Pathologic fractures may occur in young foals with septic osteomyelitis or fracture of the apophyseal process may occur from excessive tension associated with hyperflexion of the elbow.

Fracture types have been classified and may be placed into one of six categories based on the location, presence of comminution, or involvement of the articular surface. Type 1 fractures include the growth plate and metaphysis and are subdivided into 1a which involves only the growth plate and is non-articular, and 1b, a type 2 Salter-Harris articular fracture involving the anconeal process and proximal part of the trochlear notch. Type 2 fractures involve the middle of the trochlear notch and are articular. Type 3 are non-articular involving the proximal metaphyseal region. Type 4 are comminuted articular fractures and Type 5 are fractures involving the distal olecranon/ulnar shaft, extending proximally and entering the distal, non-articular portion of the trochlear notch. The fracture type and the presence and degree of displacement have a direct association with clinical management and prognosis.

Conservative management is acceptable for non-displaced fractures in which the patient is fully weight bearing and uncomplicated and the severe lameness was transient. Reports indicate a 33% rate of healing with a poor prognosis for athletic soundness with conservative management, however, clinical experience differs from this if the patient is closely monitored clinically. Radiographs should be taken every 3 to 5 days initially to monitor for the occurrence of displacement so that surgery may performed if necessary. My clinical impression is as favorable for this form of management with proper case selection as is surgical management.

Generally at least one month of stall confinement is necessary followed by a graduated increasing turn out program.

Surgical repair methods include Dynamic Compression Plating (DCP), tension band wiring (TBW), the use of a Hook Plate, or proximal to distal screw placement for type 1a fractures. Use of a DCP yielded a 75% and 78% rate of healing in two studies whereas TBW resulted in an 82% rate of healing with 76% being able to perform athletically. The hook plate resulted in a 60% rate of healing. More recently a retrospective evaluation of 24 Thoroughbred foals indicated that 22 of the 24 healed successfully and 16 were able to start a race. The affected foals did not make as many starts as their control sibling counterparts. There are several salient points not commonly discussed but have bearing on clinical management and outcome. Type 1a fractures may be difficult to recognize initially due to the normally wide growth plate. Accurate radiographic positioning is mandatory and comparison to the opposite elbow is helpful. Serial radiographs over one to two days allowing for more separation may also be necessary as well. Repair in the young foal may be accomplished relatively non invasively using a 6.5 mm cancellous screw with a washer at the head of the screw. The screw is directed from proximal to distal using a lag technique and avoiding excessive tightening to prevent crushing of the proximal piece. Likewise when using a DCP or hook plate to repair these, caution must be exercised against over compression and fragmenting this portion.

Type 4 fractures with severe comminution and displacement may be difficult to reduce into correct positioning. In addition to extending and retracting the limb slightly caudally, reduction may be facilitated by use of tension wires coursing from the proximal to distal main components of the olecranon. After reduction, an appropriate DCP is formed and placed. The wires may remain and have some benefit at providing compression at the cranial portion of the fracture along the articular notch.

By convention olecranon fractures are repaired in lateral recumbency, however, many may be repaired in dorsal recumbency with the carpus flexed; the limb may be elevated and retracted caudally to allow reduction of the fracture. Likewise, implant removal is easily performed in dorsal as well as lateral recumbency.

Dysplasia resulting from fixation of the ulna to the radius does occur and guidelines of removal of the screws by 8 to 10 weeks should be adhered to. Even at this I have seen foals develop disproportionate growth and dysplasia possible associated with the initial injury involving the growth plate.
Because of the variation in fracture types, presentation, and client variation, the surgeon should be adept at several or all methods of repairs as each is likely most suited to a given case. Generally repair of olecranon fractures is rewarding, however, there is little latitude for mistakes and even in the best of situations can be humbling experiences.

SUGGESTED READING

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