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### CLINICAL REPORT

## Management of an Olecranon Fracture in a Horse

Rahim Mohammadi\*, Seyed Mohammad Hashemi-Asl

*Department of Surgery and Diagnostic Imaging, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran*

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#### Abstract

**Case Description-** Olecranon fractures are frequently encountered in horses especially in foals. External trauma due to kicks or falls is the most common cause of the fracture. Treatment modalities of olecranon fractures including prolonged stall rest and surgical reconstruction of the different types of fractures have been proposed with different outcomes.

**Clinical findings-** The horse displayed a 75-day duration of right forelimb lameness while galloping. According to the owner the horse had stumbled on his right forelimb and found 2 days in a non-weight bearing stance with a painful swelling felt on the right elbow on palpation.

**Treatment and Outcome-** This article described nonsurgical management of an olecranon fracture in an adult horse subjected to 2 months complete stall rest. The horse regained soundness and performed his job normally.

**Clinical relevance-** Information regarding the history, clinical signs, diagnosis, management and long-term prognosis were discussed and compared with the current literature. Uncomplicated olecranon fractures with late referral to the clinic may go unnoticed because of no lameness in physical examinations.

\* Correspondence to: Rahim Mohammadi, Department of Surgery and Diagnostic Imaging, Faculty of Veterinary Medicine, Urmia University, Nazloo Road, Urmia, 57153 1177, Iran  
E-mail: [r.mohammadi@urmia.ac.ir](mailto:r.mohammadi@urmia.ac.ir)

## 1. Case Description

An 8-year-old, 300 kg, racing Kurd stallion was presented to the Urmia University– Veterinary Teaching Hospital (Urmia – Iran) for evaluation of a 75-day duration of right forelimb lameness while galloping.

## 2. Clinical Findings

According to the owner the horse had stumbled on his right forelimb and found 2 days in a non-weight bearing stance with a painful swelling felt on the right elbow on palpation. A single dose of flunixin meglumine (Razak Co., Tehran, Iran) had been administered by a local veterinarian and the horse was subjected to stall rest for a month. Then the horse had been returned to service and lameness was seen while galloping. After one month more stall resting the horse was presented to the hospital. On physical examination no swelling was observed, however, pain was felt on palpation of the right elbow. The horse was bright, alert and responsive with no signs of lameness while walking (Fig 1). All vital parameters were within normal limits.

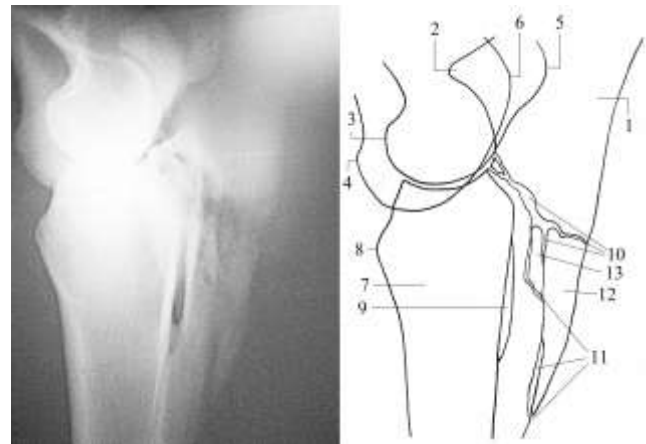


**Figure 1.** The horse with olecranon fracture was bright, alert and responsive with no signs of lameness in walking.

## 3. Treatment and Outcome

Radiographic examination revealed a complete transverse diaphyseal non-articular/non-displaced fracture of olecranon and a longitudinal fracture of ulna. The anconeal process and the semilunar portion were not involved.

Radiographic examination (Kvp68, mAs6) revealed a comminuted fracture of olecranon involving non-articular portion of trochlear notch of the ulna. A large and a small fragment of fractured bone were separated from ulna and callus formation irregularities were also observed in periphery of fracture lines (Fig. 2). Regarding involvement of non-articular portion of trochlear notch of the ulna the horse was recommended to have complete stall rest for 60 days without external coaptation.



**Figure 2.** Lateromedial slightly oblique radiograph and schematic representation of an eight-year old mare elbow with chronic comminuted fracture of the olecranon. The accident occurred 2/5 month ago and she was showing lameness only in trot pace. Although one of the fracture lines entered the trochlear notch of the ulna, it involved the non-articular area. 1, Olecranon; 2, Anconeal process; 3, Medial condyle of humerus; 4, Lateral condyle of humerus; 5, Medial epicondyle; 6, Lateral epicondyle; 7, Radius; 8, Radial tuberosity; 9, Interosseous space; 10, Transverse fracture line of olecranon; 11, Fracture distal line; 12 and 13, Two fragments of bone in fracture area.

## 4. Clinical Relevance

Fractures of the ulna and olecranon are relatively common in horses and are primarily caused by external trauma.<sup>1,2</sup> Clinical signs usually associated with olecranon fractures are manifested as an inability to bear weight on the injured limb and the classic “dropped elbow” stance. However, a

small percentage of horses may still be able to bear weight on the limb with different grades of lameness.<sup>3</sup>

Different surgical techniques to repair olecranon fractures in horses such as tension band plate, tension band wiring including wires alone or in combination with pins or screws and hook plate fixation have been reported.<sup>3-10</sup>

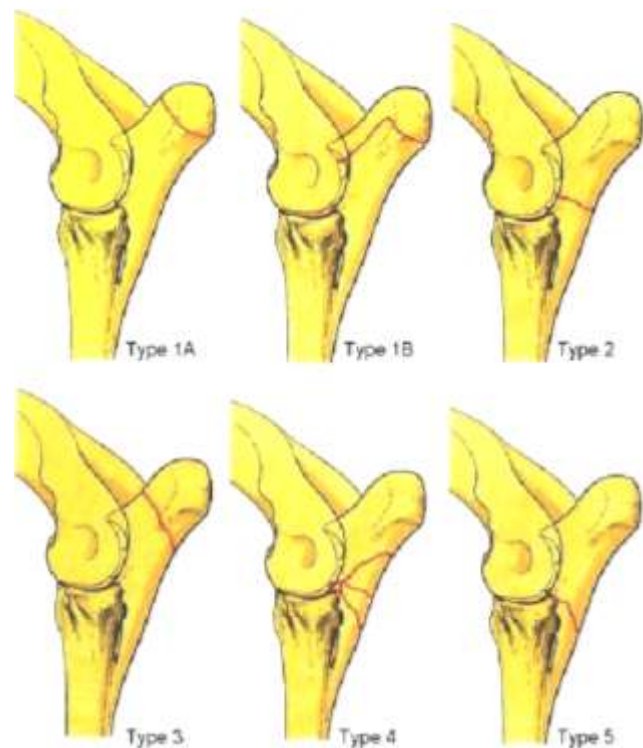
These fractures have also been treated non-surgically by stall rest with or without external coaptation and surgically by means of internal fixation and there have been numerous reports on internal fixation of olecranon and ulnar fractures.<sup>7,11-15</sup> However, most have involved small numbers of horses, making it difficult to draw definite conclusions about overall success rate. Overall, satisfactory results have been reported in 50 of 65 horses.<sup>12-15</sup> The treatment depends on fracture configuration and patient age, but most are treated by internal fixation using a bone plate applied to the caudal aspect of the bone, and the prognosis for return to full function is favorable in most cases.<sup>16,17</sup>

Several reports describe the benefits and the excellent results obtained with open reduction and internal fixation of olecranon fractures.<sup>3,5,12,18-21</sup> A retrospective study of 29 olecranon fractures surgically repaired with a tension band plate revealed a success rate of 68%, with 84% of these horses returning to athletic function.<sup>18</sup> In another study of 21 cases of olecranon fractures also treated with tension band plating, 76% of the horses regained full limb function.<sup>19</sup> In both studies, type-2 fractures were the most common configuration. In addition, a recent report describing the racing prognosis for horses undergoing internal fixation of olecranon fractures by different methods of stabilization (i.e. DCP, hook plate and tension band wires) has shown an overall favorable prognosis for racing, being the DCP the most commonly employed method of repair.<sup>21</sup> A more recent series of type-5 olecranon fractures in 20 horses treated surgically by plate fixation has shown that 13 of the 15 horses (87%) of which long-term follow up was available returned to athletic use or were in training.<sup>3</sup> In previous reports of nonsurgical treatment of ulnar fractures, results were satisfactory, unsatisfactory, and mixed.<sup>7,9,10,15</sup>

The cause of the fracture is associated with direct trauma usually produced by a kick or a fall (Richardson, 2000; Watkins, 2006).<sup>1,2</sup> Other reported causes of trauma include horse fights, hit by vehicle, caught in fencing and difficult anesthetic recovery.<sup>3</sup> In the case reported here the origin of the trauma was stumbling on the affected limb. The characteristic position of semi-flexed carpus and fetlock and “drooped elbow” adopted by many horses with olecranon fractures is explained by the disruption of the

triceps brachii muscle. The triceps muscle inserts on the olecranon process. Upward traction of the olecranon produced by the triceps contraction extends the elbow joint. When the elbow is extended, the other joints of the forelimb are passively fixed in the weight bearing position by the stay apparatus. Therefore, the ability of the horse to fully extend the forelimb and fix it in the weight bearing position relies on the integrity of the olecranon. Although the “dropped elbow” is a well-known clinical sign of horses with olecranon fractures, care should be exercised to differentiate it from other conditions such as radial nerve paralysis and humeral fractures based solely on the clinical presentation.<sup>16,17</sup>

Controversy exists among authors in regard to the most common type of olecranon fracture. Whereas type-2 olecranon fractures (Fig. 3) have been reported as the most common fracture.<sup>8,18,19</sup>



**Figure 3.** Classification of olecranon fractures.<sup>23</sup>

Treatment selection for cases of olecranon fractures is dictated by the configuration of the fracture, its level at the olecranon in relation to the radio-humeral articulation and the age and weight of the horse.<sup>1,2,17,22</sup> An overall poor prognosis for recovery has been shown after nonsurgical treatment of ulnar fractures.<sup>15</sup> Therefore, nonsurgical treatment (i.e. stall rest and full-limb splinting) has only been recommended for non-articular/non-displaced fractures.<sup>18,19</sup> Although nonsurgical treatment has been an

affordable and successful option for treatment of non-articular/non-displaced fractures decreased convalescence period and improved level of comfort can be attained by treating these cases surgically.<sup>16</sup>

Nonsurgical management of ulnar fractures, although widely practiced, appears to be less rewarding than surgical management by internal fixation. Nonsurgical treatment should be elected only in cases where economics is of primary concern, when the fracture involves only the distal portion of the semilunar notch, or when severe comminution of fracture fragments precludes any attempt at surgical reconstruction.<sup>15</sup>

Following 2 months in a telephone conversation with owner, it was found out that she did not show any sign of lameness even in gallop. Unfortunately, we could not convince the owner to get her to the hospital for follow-up radiography.

Apart from treatment selection for cases of olecranon fractures, it should be taken into consideration that uncomplicated olecranon fractures with late referral to the clinic may go unnoticed because of no lameness in physical examinations.

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## Conflict of interests

None

## References

1. Richardson DW. Ulnar fractures. In: White NM, Moore JN, eds. *Current practice of equine surgery*. Philadelphia: JB Lippincott Co, 1990;641-646.
2. Watkins JP. The radius and ulna. In: Auer JA, Stick JA, eds. *Equine surgery*. 2nd ed. Philadelphia: WB Saunders Co, 2006;1267-1279.
3. Swore TM, Watkins JP, Bahr A, Epstein KL, Honnas CM. Results of plate fixation of type 5 olecranon fractures in 20 horses. *Equine Veterinary Journal*, 2006;38:30-34.
4. Fretz PB. Fractured ulna in the horse. *Canadian Veterinary Journal*, 1973;14:50-3.

5. Anderson DE, Allen D, Debowes RM. Comminuted, articular fractures of the olecranon process in horses: 17 cases (1980 to 1990). *Veterinary and Comparative Orthopaedics and Traumatology*, 1995;8:141-145.
6. Fackelman GE. Ulna (olecranon): plate fixation. In: Fackelman GE, Nunamaker GM, Auer JA. eds. *Principles of equine osteosynthesis*. New York: Thieme 2000;159-169.
7. Monin, T. Repair of physeal fractures of the tuber olecranon in the horse, using a tension band method. *Journal of American Veterinary Medical Association*, 1978;172:287-290.
8. Martin F, Richardson DW, Nunamaker DM, Ross MW, Orsini JA. Use of tension band wires in horses with fractures of the ulna: 22 cases (1980-1992). *Journal of American Veterinary Medical Association*, 1995;207:1085-1089.
9. Richardson DW. Ulna (olecranon): tension band wiring. In: Fackelman GE, Nunamaker GM, Auer JA. eds. *Principles of equine osteosynthesis*. New York: Thieme 2000;171-177.
10. Murray RC, Debowes RM, Gaughan EM, Bramlage LR. Application of a hook plate for management of equine ulnar fractures. *Veterinary Surgery*, 1996;25:207-212.
11. Colahan PT, Meagher DM. Repair of comminuted fractures of the proximal ulna and olecranon in young horses using tension band plating. *Veterinary Surgery*, 1979;8:105-111.
12. McGill CA, Hilber BJ, Jacobs KV. Internal fixation of fractures of the ulna in the horse. *Australian Veterinary Journal*, 1982;58:101-114
13. de Oliveira Dearo AC, Fonteque JH, Vidal FD, Pirolo J. Surgical repair of an olecranon fracture in a horse. *Semina: Ciencias Agrarias*, 2010;31:197-204
14. Jansson N. Surgical treatment of an ulnar fracture complicated by anconeal process fragmentation. *Compendium Equine*, 2008;3:144-147.
15. Wilson DG, Riedesel E. Nonsurgical Management of Ulnar Fractures in the Horse: A Retrospective Study of 43 Cases. *Veterinary Surgery*, 1985;14:283-286.
16. Watkins JP. The radius and ulna. In: Auer JA, Stick JA, eds. *Equine Surgery*. 3rd ed. Philadelphia: WB Saunders 1999:831-841.
17. Nixon AJ. Fractures of the ulna. In: Nixon AJ. eds. *Equine Fracture Repair*. Philadelphia: WB Saunders 1996:231-241.

18. Donecker JM, Bramlage LR, Gabel AA. Retrospective analysis of 29 fractures of the olecranon process of the equine ulna. *Journal of American Veterinary Medical Association*, 1984;185:183-189.
19. Denny HR, Barr ARS, Waterman, A. Surgical treatment of fractures of the olecranon in the horse: A comparative review of 25 cases. *Equine Veterinary Journal*, 1987;4:319-325.
20. Scott EA, Mattoon JS, Adams JG, Riebold TW, Teshera J. Surgical repair of bilateral comminuted articular ulnar fractures in a seven-month-old horse. *Journal of American Veterinary Medical Association*, 1998;212:1380-1383.
21. Janicek JC, Rodgerson DH, Hunt RJ, Spirito MA, Thorpe PE, Tessman RK. Racing prognosis of horses following surgically repaired olecranon fractures. *Canadian Veterinary Journal*, 2006;47:241-245.
22. Stashak TS. Fractures of the ulna. In: *Adams' lameness in horses*. eds. Baltimore: Lippincott Williams & Wilkins 2002;879-894.
23. Fackelman GE. Ulna (olecranon): Plate fixation. In: Fackelman GE, Nunamaker GM, Auer JA. eds. *Principles of equine osteosynthesis*. New York: Thieme 2000;159-169.

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چکیده

### مدیریت یک مورد شکستگی اولکرانون در اسب

رحیم محمدی، سید محمد هاشمی اصل

گروه جراحی و تصویربرداری تشخیصی، دانشکده دامپزشکی، دانشگاه ارومیه، ارومیه، ایران

**توصیف بیمار:** شکستگی‌های اولکرانون به کرات در اسب‌ها و به‌ویژه در کره‌ها ایجاد می‌شوند. ترومای خارجی در اثر لگدزدن یا افتادن شایع‌ترین علت شکستگی است. درمان‌های شکستگی اولکرانون شامل استراحت طولانی‌مدت در اصطبل و بازسازی انواع مختلف شکستگی‌ها با جراحی پیشنهاد شده‌اند و نتایج متغیری داشته‌اند.

**یافته‌های بالینی:** اسب لنگش ۷۵ روزه‌ای در اندام قدامی سمت راست هنگام تاخت چهارنعل نشان می‌داد. بر اساس گفته‌های دامدار، اسب بر روی اندام قدامی راست خود تلو تلو می‌خورد و در دو روز اخیر بر روی اندام فوق تحمل وزن نکرده و هنگام ملامسه، تورم دردناکی در آرنج سمت راست احساس می‌شد.

**درمان و پیامد:** این مقاله مدیریت غیر جراحی شکستگی اولکرانون را در اسب بالغی که دو ماه در اصطبل استراحت کرده است توصیف می‌کند. اسب سلامتی خود را بازیافت و عملکرد طبیعی خود را انجام داد.

**کاربرد بالینی:** اطلاعاتی درباره تاریخچه، علائم بالینی، تشخیص، مدیریت و پیش‌آگهی طولانی‌مدت مورد بحث قرار گرفته و با منابع موجود مقایسه شدند. شکستگی‌های ساده اولکرانون که دیر هنگام به درمانگاه ارجاع داده شوند ممکن است به دلیل عدم لنگش هنگام معاینه بالینی مورد توجه قرار نگیرند.

**کلمات کلیدی:** اولکرانون، شکستگی، غیر جراحی، رادیوگرافی، اسب.