

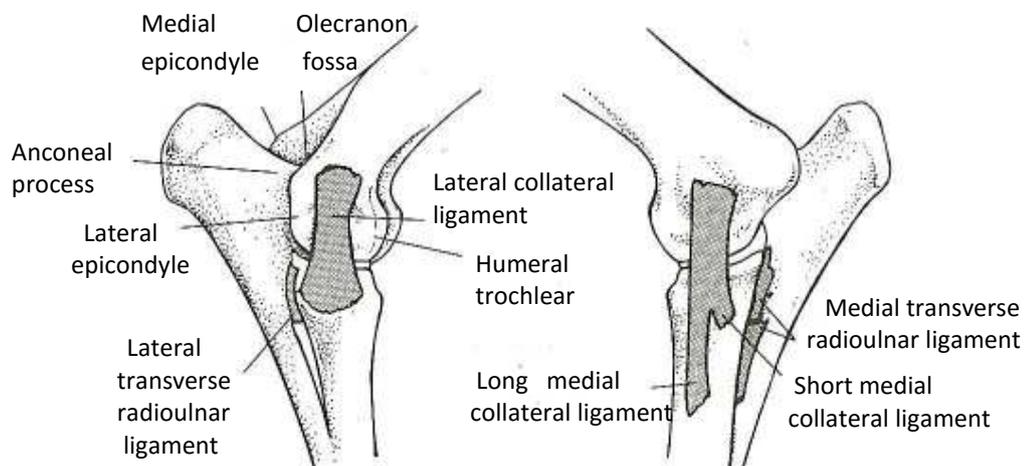
“The Elbow: A Joint in TROUBLE!”

Presenter: Sharon May-Davis

The equine elbow is located in the forelimb and is the joint between the knee (distal) and the shoulder (proximal). It consists of 3 bones; Humerus, Radius and Ulna, and is regarded as a hinge or ginglymus joint that moves in one plane – flexion or extension with no lateral movement.



Figure 1. Diagrams from Smythe and Goody (1993). Adapted by SMD



In a normal standing position the elbow lies between 140-150 degrees at the dorsal angle and is braced in this position by collateral ligaments and muscular co-operation. In flexion, the collateral ligaments loosen allowing the radius and ulna to slightly rotate outwards due to the structural nature of the trochlear groove in the distal humerus and the action of the anconeal process into the olecranon fossa.

Due to the anatomic structures involved, Smythe and Goody (1993) discuss over extension in this format, *“owing to the passage of the anconeal process into the olecranon fossa of the humerus, the biceps brachii muscle and collateral ligaments of the joint, overextension of the elbow is not possible. The bones of the arm and forearm cannot therefore be brought into the same straight line”.*

The most commonly acknowledged elbow issues are – OC, OCD, arthritis (Fig 2), collateral ligament rupture, olecranon growth plate displacement and capped elbow.

However, unpublished work by this author discusses lesions in the humerus, ulna and radius that appear worse on the same side as an upright foot or a compromised inferior check ligament. A “double locking or slipping action” becomes significantly apparent when the horse is walking down a gradient and as such, the muscles around the elbow joint brace under load and in particular, the Lateral tricep muscle, which can become quite painful under palpation.



Figure 2. Arthritis left elbow.



Figure 3. A compromised elbow in a 6 year old Thoroughbred. Left: distal humerus Right: radius and ulna. Note: Wear pattern in humerus and blood spot in ulna – both arrowed. Photos by C. Maroni

According to Rooney’s, The Lamé Horse (1998), the wear pattern in the humerus (left) was referred to as a “synovial fossa” in the articular surface, although its function was not known, it is probably related to the lubrication mechanism of large joints.

The accuracy of this statement is very likely to be incorrect, as this synovial fossa is not in the newborn foal, nor in horses that have never been ridden or driven in harness.



Figure 4. Left: Stillborn Centre: 5 year old Right: 14 year old
NOTE: The 5 & 14 yr old were never ridden and neither feature the synovial fossa.

This also applied to the 15 year old feral Donkey from the Northern Territory that was never ridden or worked in harness.

Figure 5. A 15 year old feral Donkey from the Northern Territory.



However, what is evident at birth and in unriden horses is a slight depression in the cartilage that is difficult to detect, yet this is still covered by cartilage in those horses that are not ridden or driven. The lesions can be so severe that when afflicted horses die, the bones show severe changes (Figure 6 - top), although this is not the case in unriden horses as seen in the bottom two photographs.

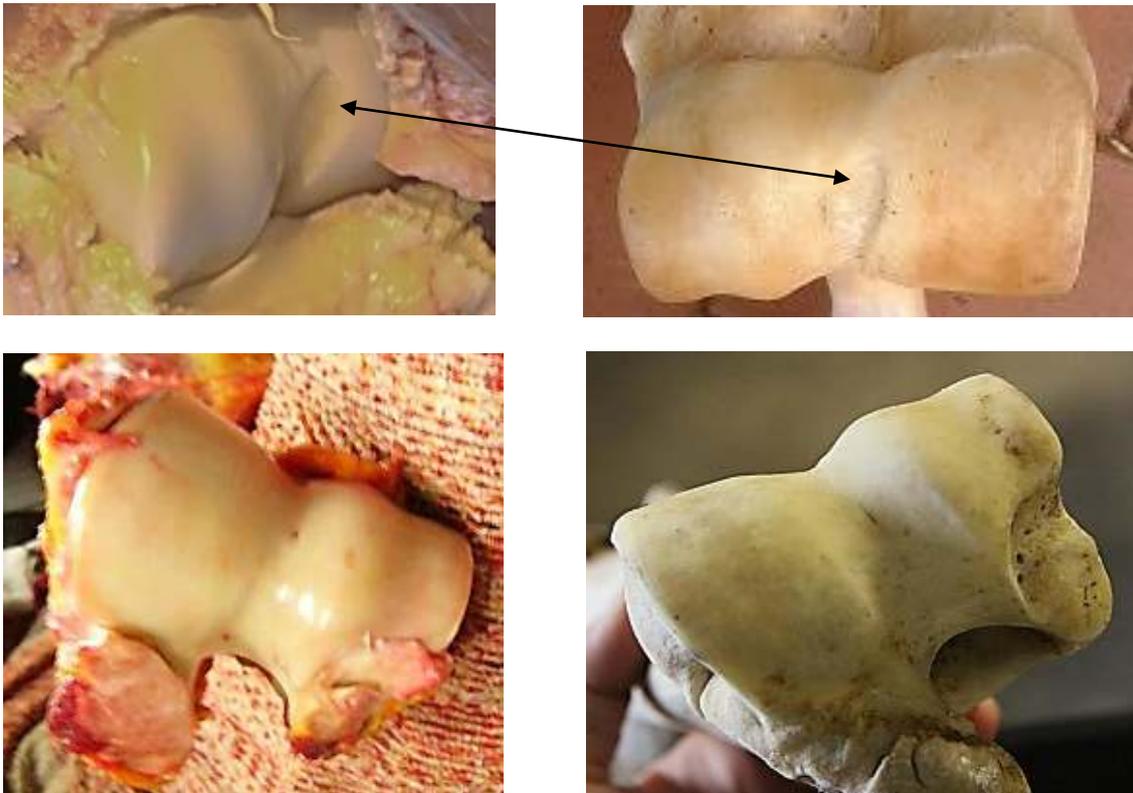


Figure 6. Top row: 18 year old Thoroughbred (1 start then bred until 18). Bottom row: 14 year old Morgan.

In the photographs on the top row, the wear pattern is apparent in the cartilage in the top left and is mirrored in the bone. This 18 year old mare had a very short racing career before breaking down irrevocably and becoming a brood mare for 15 years with the last few years laced with sporadic episodes of laminitis. This mare showed an obvious displacement of the elbow on the gradient.

The 14 year brood mare in the bottom row of pictures was never ridden or broken in and prior to euthanasia had a laminitic episode 2 years prior. Note no cartilage or boney changes as shown in the top row. This mare had no displacement of the elbow on the gradient.

Furthermore, in the dissection of horses showing this affliction, inflammation in and around the primary origins of the Superficial and Deep digital flexor tendons on the medial epicondyle has been observed. It is important to note that these two origins are difficult to palpate, but still display pain and tension even though the horse's responses are less reactive than to those of the Lateral tricep.

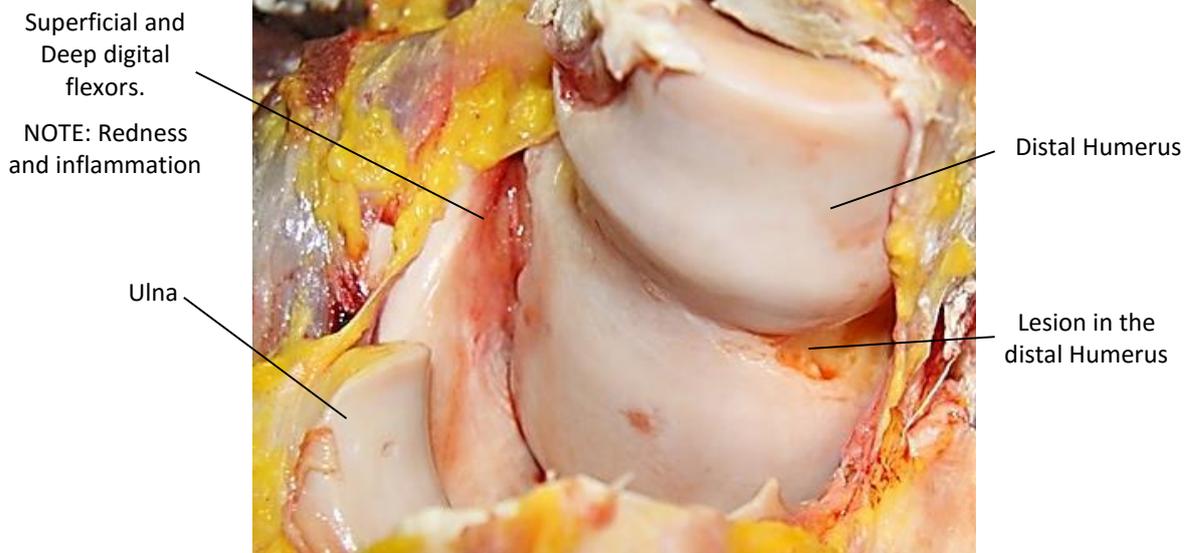
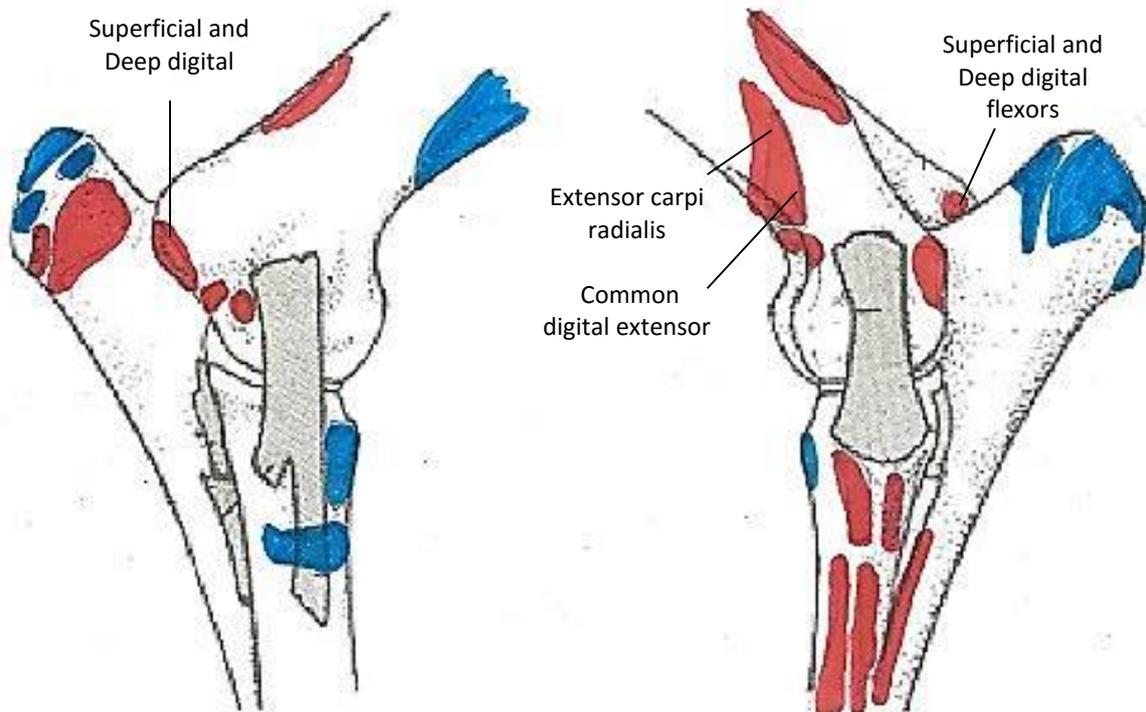


Figure 7. Top row: 18 year old Thoroughbred (1 start then bred until 18). Bottom row: 14 year old Morgan.

Unfortunately, this condition is rarely recognized due to the lack of obvious lameness. However in some cases, the horse exhibits lameness with a slight head bob when the cartilage is rupturing in the early stages of lesion development. At this point in time, it is unknown when the lesion actually starts; suffice to say that it has been noted in dissection on the Radius, Humerus and Ulna to have begun within 3 months of riding.

Once the lesion has started, there is no timeframe as to when it becomes a mild or severe case in the ridden or driven horse. In one example; a 3 year old Thoroughbred racehorse presented with a severe subluxing action on the gradient, hemoarthrosis (blood in the synovial fluid) and lesions of the Humerus, Radius and Ulna, post 5 race starts.

Without a visually identifiable lameness, it follows that the problem is rarely going to be diagnosed. Riders often feel that their horse is just a bit 'off', noting a hesitation in the movement but without being able to define the point of origin. Many say that it feels to be the shoulder and is an obvious choice when watching from a lateral aspect.

When a problem has been recognized and veterinarians have attempted to inject into the joint, blood has been noted on the drawback of the needle - hemoarthrosis (Figure 8).



Figure 8. Left: Hemoarthrosis from the elbow joint. Centre: Humerus. Right: Radius and Ulna.

NOTE: The 3 photographs above are from a 16 year old Thoroughbred ridden until 14.

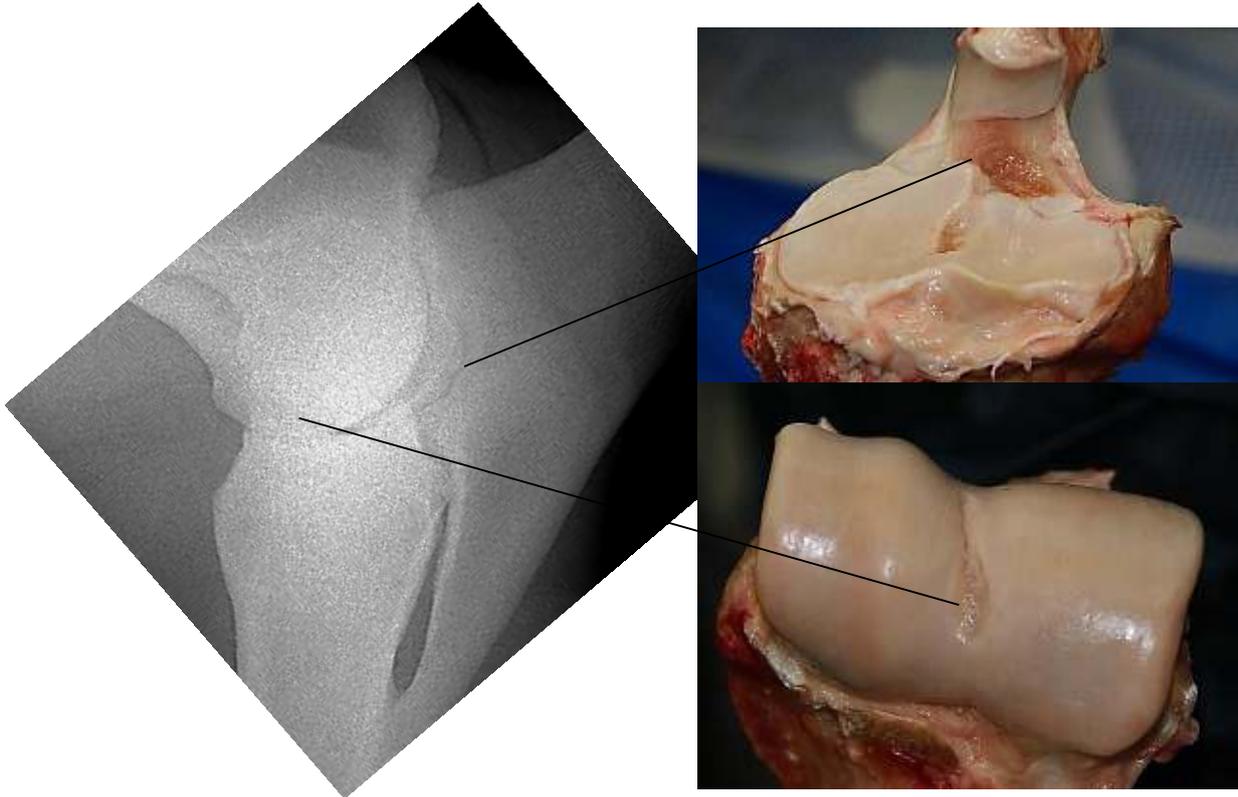
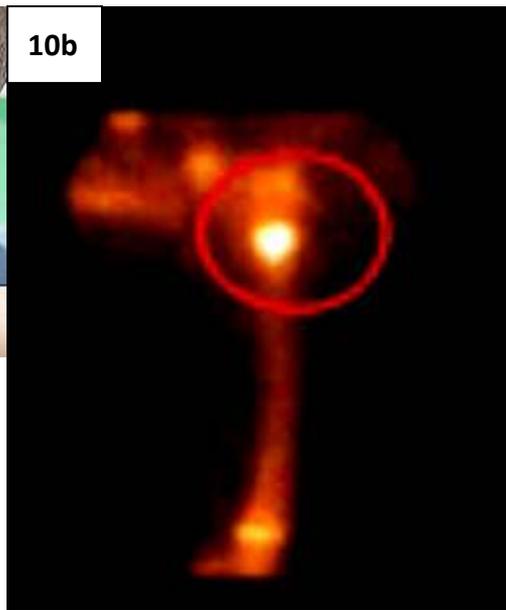


Figure 9. Left: Radiograph of the left elbow. Top Right: Radius and Ulna. Bottom left: Humerus
 NOTE: The 3 pictures above are from a 23 year old Thoroughbred that had 9 starts.

Diagnosis is very difficult, the radiograph above does show the Ulna lesion and to some extent the one on the Humerus, but the Radius has no clear definition.

So how do we diagnose this condition? Horses will respond to palpation of the joint (Figure 10a) by showing discomfort caudal to the Lateral proximal tuberosity of the Radius and the Lateral collateral ligament. Radiographs are subjective and reliant upon the machine's and operator's capabilities. Scintigraphy is beneficial as long as OC, OCD and Subchondral cysts have been ruled out (Figure 10b).



So just to re-cap and add a little more :-

- The action looks like a slip and or clunk into the shoulder or a shudder or a sliding / slipping action. It depends upon your perspective. The actual change in the action begins when the foreleg is in the 'Stance Phase' during the stride as the limb goes into the posterior phase of the stride. It is more obvious going down a hill.
- A normal flexion test of the elbow does not show discomfort, however the horse does show discomfort when the leg is taken back with the knee bent and cannon parallel to the ground and the Radius lifted up and into the elbow joint closing into the area of cartilage degradation.
- So far, 100% of ridden horses exhibit this condition to a varying degree (under dissection). Horses not ridden and with no abnormalities of the Humerus do not exhibit this condition (under dissection). Horses in harness also exhibit this condition (under dissection), but to a lesser extent.
- What does the joint look like? There appears under dissection to be substantial degradation in the cartilage of the Humerus, Radius and Ulna.
- Most horses appear to handle this condition and continue with a normal life if not pushed to extremes. Although this sounds career-ending, in fact it is NOT. Once the horse gets through the worst of the wear pattern they re-settle in the joint and continue on with work.
- Lameness or unevenness has been noted in the initial stages in racehorses and Scintigraphy has noted a hot spot in the joint when the radiographs were clear.
- High level competitors require joint support to help sustain the elbow and other joints that may compensate for the change in action.
- Horses that jump are more inclined to land with straighter forelimbs. Be mindful that jumping and downhill work could possibly make the condition worse.

- Riders often feel instability in the horse's forelimbs when travelling downhill and some even question the horse's proprioception. My favourite comment being, *"I just thought my horse had a full bladder and that's why she grunted when going down hills"*.
- Bodyworkers massaging the triceps (particularly the lateral triceps) actually exacerbate the condition as the massage releases the cast-like formation that this muscle provides the joint in an attempt to stabilize the condition.
- Under dissection, I see the initial stages of this condition within 3 months of being ridden.
- CAUSATIVE FACTORS – riding, driving, unexplained vectors and gremlins?

So how do we fix it?!?

Once the cartilage is gone – it's gone!

In general, joint products can only take you so far and stem cell therapy proved to be a 'poor to guarded' prognosis for a similar condition in dog's elbows. Managing the inflammation and stimulating synovial fluid integrity seems to be having the best results and is dependent upon the individual; the severity of the condition and the ability of the veterinarian to access the joint.

"Nah – just needs a littal bit ov elbow grease mate - that al fix it!"



However, new taping products are on the market and when used as a mechanical stabilizer it was found by this author and physiotherapists on the day to be beneficial in stabilizing the action of the elbow on the gradient (Figure 11).

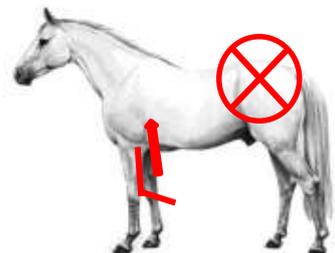
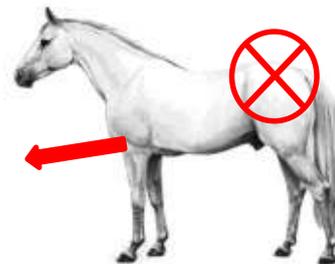


Figure 11. The taping technique used to stabilise the elbow – a mechanical tape was used (little stretch).

For the TRIMMER!

There are 2 very important positional issues associated with these soft tissue structural problems for the trimmer;

1. The horse has difficulty extending the forelimb and would prefer a flexed and lower forelimb position for trimming. To extend the toe could compromise an inflamed tendon and the horse may be reactive.
2. To take the forelimb back may press the structures together in the elbow and cause pain, especially when the forelimb is back and the knee pushed upwards.



In a shoeing/trimming trial on ONE horse's right hoof only, his elbow action returned closer to the normal range of motion when **the toe was dramatically shortened (for him)** and his heel raised to allow for a relatively normal hoof pastern axis to exist.