Corns in dogs

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Introduction

A corn is a circular area of hard tissue found only in the digital paw pads of sight hounds, the large pads are never affected. It is an overgrowth of keratin, the structural protein found in skin, horns and nails. Approximately 85% of corns occur in the pads of the central toes in the front limbs. It is a common cause of severe debilitating lameness in these breeds exacerbated when exercising on hard ground. The incidence is reported as being 2.5 to 5.9%.

Diagnosis is by observation and palpation of a thickened painful area of pad. There may be a dark centre to the corn mimicking a foreign body penetration but there is no fluid discharge; an X-ray detects most foreign bodies. Misdiagnosis is common through inexperience of the condition.

Cause

Historically it has been speculated that the cause is from:

1. Foreign body penetration
2. Virus
3. Mechanical pressure

From a histological study of 800 corns and from many excision surgeries foreign material has rarely been found. Glass and grit has been removed from the pads of a number of sight hounds by the author but none has gone on to develop a corn.

Several studies have looked for viruses without success, particularly papilloma virus that causes warts in dogs. If a virus was implicated then it would not be selective to the central toes on the front legs.

All the evidence points to repeated mechanical pressure, the same aetiology as in man where corns form from either external pressure seen with tight shoes of from toe deformities such as hammer and mallet toes. In the dog the front feet carry more weight than the back and the front limbs are also used for braking striking the ground before the hind feet thereby increasing the ground forces on these pads.

Foot deformity from fracture, dislocation, tendon injury and previous amputation have been associated with a higher incidence of corns due to increased or abnormal weight-bearing on specific pads. The most compelling evidence is from the results of the tenotomy study detailed below.

Treatments

There are many reported treatments for corns but none gives consistent acceptable results. These include regular hulling where the corn is scraped out to varying degrees with sharp instruments or burs, the application of ointments and creams designed to soften or burn out the corn, and protective dressings including tape and boots. The best results have been from complete surgical excision yet more than 50% of corns will recur in a year, the reason is that the underlying mechanical problem has not been addressed.

In man the corn will resolve if the external pressure is removed, for instance by wearing better fitting shoes, and with correction of anatomical deformities.

Digital flexor tenotomy (tendon cutting)

This is an entirely new approach to corn treatment and the hypothesis is that by unweighting the pad the pressure is reduced resolving the lameness allowing the corn to grow out and not recur.

Anatomy

The toe has two tendons that run under the toe, the superficial and deep flexors, with the superficial attaching to the bone at the first knuckle and the deep attaching onto the end of the toe by the nail. Their function is to flex the toe joints keeping the pad in contact with the ground. The other tendon on the upper aspect is the digital extensor that on contraction, raises the toe and works as an antagonist to the flexors thereby maintaining tone in the toe.

Surgery

By forcibly extending the toes the tendons are visible and palpable under the skin on the underside of the foot between the main and toe pads. A small cut is made allowing forceps to be placed under the tendons isolating them from the surrounding large veins. The two tendons are severed and the skin closed with two or three sutures.

A dressing is applied for 24 hours and then the dog is allowed to walk on the lead for a further week before given free exercise. There is minimal post-operative discomfort.

After the procedure the toe will appear flat to the ground with the nail protruding forwards. With the dog non-weight bearing lying upside down, the toe will stick up by about 30 degrees from the pull of the extensor tendon that is now unopposed by the flexors. When standing with the leg held forward the nail will be raised from the ground.

THE STUDY into the technique

The aim of the study is to prove the above hypothesis and to look at any short and long term consequences of the surgery.

For inclusion the dog must have and be clinically affected by one or more corns. The weight, breed, sex, age, chronicity, previous treatments and affected digits are recorded, as are any toe deformities. Dogs with foot deformities are excluded from this primary study.

The 7 day follow-up is by telephone and the question asked is how any improvement is rated by the following descriptions: no improvement; slight improvement; moderate improvement or great improvement. The aim is to include demeanour, willingness to exercise and the degree of lameness with any post-operative complications recorded.

The 8 week follow-up, also by telephone, asks about the degree of lameness and whether the corn is still present.

After one year a more detailed questionnaire will be sent to the owner.

Results

At the time of writing tenotomy has been performed on over 80 corns in about 60 dogs over the previous twelve months. None of these dogs had foot deformities such as previous amputations. Precise details are updated every three months on www.mikeguilliard.co.uk.

All dogs have improved and at 7 days:
10% of dogs were moderately improved.
90% of dogs were greatly improved.

At the 8 week follow-up:
30% showed slight lameness that occurred on rough ground.
70% had no lameness.
ALL the corns had grown out.

Racing greyhounds returned to the track in 4 weeks of the surgery with no ill effects.

Three dogs developed corns in adjacent toes after about 3 months.

Dogs with foot deformities

The technique is less successful in these cases as it would appear that the tenotomised toe requires support from adjacent toes. Although the corns grow out lameness occurs from direct pressure on the underside of the toe that has increased loading. Other techniques are used in these cases but more follow-up is needed to determine the success of these procedures.

Discussion

This study supports the hypothesis that corns are a direct result of repeated focal pressure on the pad. It also shows that there is very little post-operative discomfort with the dogs improving rapidly within days and as a result corns on multiple feet can have the procedure done in one session.

Although cases have not been followed for more than a year it would appear that the corn will not regrow and there are very few long term consequences. It has been recognised that there is, after toe amputation, an increased risk of a corn developing on another pad on that foot and the same risk occurs after tenotomy with the remaining toes taking an increased load.

There also appears to be a genetic factor as the condition is only seen in sight hound breeds and it is reported in related dogs, in one case 5 out of a litter of 8 developed corns.

The reported slight lameness recorded in 30% of dogs appears to be from direct pressure on the underside of the toe especially on rough ground.

This novel surgical method is proving to be a very effective treatment of corns having global recognition among veterinarians and with ongoing research it is hoped that a solution to this debilitating condition has finally been found.