



# Viral Warts

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**Papilloma – it's a word that every horse owner is probably quite familiar with and if you also happen to have spent a bit of time around cattle, it's likely that you've come across a few cases of this common wart virus in the past. But, do you know what actually causes it and how it is transmitted from animal to animal - and are you up to date on the latest research and treatments?**

Equine Papilloma Virus is specific to the horse and is just one of hundreds of common wart viruses (papillomaviridae family) found in mammals that are considered 'species specific'.

More than 100 distinct human papilloma viruses are recorded, the rabbit has two, six different types occur in cattle and three are found in dogs. In the medical world, warts are typically referred to as papillomas with 'papill' being Latin for 'nipple' and 'oma' meaning 'a morbid growth'.

Equine warts typically appear as small lumps on the skin of a horse, commonly around the eyes, muzzle and ears.

Although not cosmetically appealing, EPV (Equine Papilloma Virus) typically does not pose a serious health threat to the horse. It is however, a highly contagious viral disease and poses a high risk of infecting other horses located in the same vicinity.

Foals and young horses up to the age three to four years are most at risk due to their immature immune systems, but older horses can still be at risk of being infected, particularly if there is an underlying condition causing a weakened immune response.

## THE VIRUS

Papilloma viruses are small, double-stranded DNA viruses of the

Papovaviridae family. The virus is transmitted by direct contact, infected objects and possibly by insects. The virus infects the skin cells, causing various replication abnormalities in the skin cells and excess production of keratin (a major protein type in skin and hair). The growth of multiple papillomas or clusters of warts on skin or mucosal surfaces is referred to as Papillomatosis and is commonly seen in younger animals.

Single papillomas are more often seen on older animals and are usually more problematic to treat.

The lesions appear as hard, horn-like (keratotic) epidermal 'explosions' that resemble a cauliflower head - and may be described as 'verruca vulgaris'.

## TRANSMISSION

Young, curious horses are constantly sustaining cuts, abrasions and minor skin wounds around the muzzle and it is widely accepted (although not proven), that EPV initially gains access through these small cuts.

The highly contagious virus is transmitted via direct contact between horses, contact with contaminated equipment (e.g. brushes, tack, rugs, feed bins, stables). It can also be spread via flies.

The muzzle-rubbing behaviour of young horses could explain the high occurrence of papillomas forming around the soft-skinned muzzle area, but lesions typically occur around the eyes and ears as well.

Less commonly, papillomas are found in the genital area or on the limbs and infection in these areas can be caused by a different papilloma virus or a more serious condition.

Congenital (inherited) EPV occurs rarely and newborn foals infected in-utero will have lesions on the head, neck, back, and croup.

NB: EPV cannot be spread to humans.

### THE SIGNS

Equine papillomas first appear as tiny, hard, grey swellings, most commonly on the muzzle, around the eyes, ears and under the tail; and occasionally on other parts of the body.

It is generally thought that the softer parts of the horse's skin and areas with less hair growth are more susceptible to viral exposure.

They can grow to between 5mm and 20mm in size, turning a pinky-grey colour as they mature. More often than not, the warts grow in a cluster of many lesions (papillomatosis) creating a cauliflower-like appearance.

EPV can survive in the environment for up to two months and warts begin to appear around two months after initial exposure. The disease is self-limiting in young horses and lesions generally disappear spontaneously within two to three months, but may last up to a year in persistent cases.

Papillomatosis can become a herd problem when a large group of young horses are kept together. The warts will disappear as their immunity, but infection occasionally recurs in stressed animals.

A more serious form of the virus, spread by fly bites and called aural plaques or a flat form of papilloma (*verruca planum*); can infect the



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inner surface of the ears.

Lesions appear as flat, white and sometimes scaly areas in the ear pinnae. They cause no irritation or discomfort to the horse on their own, but are susceptible to secondary bacterial infection and some horses develop violent head shyness – particularly if the lesions are aggravated by fly bites.

Ear papillomas (aural plaques) usually occur in horses over one year of age. The anus and external genitalia can also be affected. The plaques can be limited to just a few or progress to involve the entire inner surface of the ear.

Unlike the facial form of EPV, aural plaques do not spontaneously regress and can easily be mistaken for other types of skin conditions. Ear plaques are not treatable and become permanent cosmetic blemishes due to skin depigmentation.

### DIFFERENTIAL DIAGNOSIS

In most cases, diagnosis of EPV is simple and based on the appearance of signs, history of the disease and veterinary observation.

But, some types of equine sarcoids (benign skin tumours) bear a resemblance to EPV and misdiagnosis can occur, particularly if the warts are found in the genital area. If your Veterinarian is unsure, he will usually collect a biopsy sample for analysis.

NB: More about sarcoids and their connection with papilloma virus is covered further on.

In addition, aural plaques can develop a waxy coating and appear flaky over time. This can lead to a misdiagnosis of a fungal condition.

Ear papillomas are also sometimes mistaken for allergic reactions or inflammation/infection from fly bites. Flies are attracted to any exudate (serum leakage) that results from the papillomas becoming open or crusted due to

rubbing or irritation and they are implicated in helping spread lesions around the body.

Fly bite also damages the skin, allowing the virus to invade the cells.

Nodular lesions with grayish-white centres, particularly along the saddle area or the sides of the body or neck, could also be the early stages of equine eosinophilic granuloma, another immune-mediated condition caused by insect bites or trauma.

## TREATMENT

Equine papillomas are disfiguring but always benign and the disease is self-limiting. If your horse is not on the show circuit and the lesions cause relatively little aggravation (either from the horse rubbing or licking them, or from bridles, tack etc) – it is best to just leave them alone.

Except in the case of aural plaques, immunity to the virus naturally develops over two to three months and the warts spontaneously disappear, leaving no scarring.

But, there are several significant reasons for attempting treatment, including large lesion growths that interfere with eating or cause severe irritation, secondary bacterial infection from open wounds or less importantly, cosmetic appearance.

Some of the most common secondary problems arise during the summer, with warts that are rubbed raw or opened up from being damaged becoming infested with fly larvae and consequent infections. Using insect preventative methods will lessen the chance of this happening.

On the upside, once a horse has been infected it is less susceptible to future infections. Good management practices with hygiene, parasite control and proper nutrition

should help shorten the course of disease and lessen complications.

If you can't possibly wait for the virus to resolve itself naturally, there are a few treatments to consider:

### **Surgical Excision (removal)** –

Often successful if done when the warts are fully grown and usually recommended when the papillomas interfere with eating or are causing severe irritation. There is anecdotal evidence that removing a few lesions will stimulate the horse's immune response and speed up the recovery process, but scientific tests have failed to prove the theory. Surgical removal can leave scarring or blemishes.

**Cryosurgery** - Warts can also be frozen. This treatment is generally successful and requires the warts to be frozen with liquid nitrogen. It is often recommended for cases causing extreme irritation and has been successful in getting rid of mass aural plaques. The treatment can leave white scarring or blemishes and possible disfigurement if used on the ears. Laser therapy has also been successful in some cases.

**Vaccine** – Called an 'autogenous vaccine' or 'autoimmunization'.

The vaccine is made up of ground excised wart tissue from the affected animal, rendered inactive with formalin and injected into that individual animal. Repeated doses are recommended and scientists question their value. A controlled study of the vaccination technique failed to show that it will speed up the natural healing process, but it does prevent further warts developing.

**Topical Creams** - Numerous topical products are emerging as potential treatments, but to date there are no studies confirming that any are effective. Immunostimulant drugs or creams have been used in some cases. Again, their effectiveness is unreliable.

**NB:** There is no documented treatment for aural plaques. The topical product tretinoin (Retin-A) has been reported to be effective, but not proven. Typically, the recommendation is to keep the ear clean and protected from insects (particularly flies) – and leave it alone.

## CONTROLLING THE SPREAD

Papillomatosis is a highly contagious disease. Infection control is vital, particularly where there are other horses in the same proximity. If your young horse is on the halter circuit, he/she will pose a risk to others at shows.

**Isolate** - Where possible, any horse suspected of having equine warts should be isolated from the rest of the group immediately.

**Disinfect** – Both premises and equipment. Disinfecting general equipment, such as feed bowls, grooming brushes and clippers,

water buckets, bridles, fly masks and

head collars are a necessity in minimising the spread of equine warts. Saddle pads and rugs can be washed in hot water with disinfectant.

Disinfection of areas/buildings where an infected horse has frequented is strongly recommended – don't forget the horse float! Chlorhexidine and iodine are effective disinfectants and should always be used precisely as directed by your veterinarian.

**NB:** Even minimal changes to the ratio or mixture can mean the product will be less effective.

**Separate** – Set up a separate area and set aside a personal tack/grooming/feed kit for the affected horse. Use separate feeding utensils and equipment and ensure you practice good hygiene yourself – e.g. wash hands before handling other horses and their equipment.

**Protect** – Flies are implicated in the spread of EPV so fly protection is important and logical in preventing the further spread of the virus.

Fly sheets, face masks and screens with ear coverage can work well

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if they are properly fitted. It is probably best not to use fly repellents on the warts directly due to the danger of irritation and further complications. It is however, good practice to use a safe, outdoor repellent on stable and yard walls if necessary.

## THE SARCOID CONNECTION

Equine sarcoids are non-malignant cancer growths on the equine skin, linked to Bovine papillomavirus. They are the most common Equine skin tumour and usually affect the area around the eyes, sheath, ears, chest and lower limbs – but can be found almost anywhere on the horse.

Although rarely fatal, the lesions are often distressing and occasionally untreatable. They can affect any horse of any age. There are six types of sarcoids – occult, fibroblastic, malevolent, mixed, nodular (type A and B) and verrucous sarcoids.

The verrucous sarcoid has a wart-like appearance and is often confused with papillomavirus. In addition and just like warts, sarcoids show up particularly in areas where horses have very little hair and thin skin.

Sarcoid treatment options are similar to papillomavirus treatments, and some owners also opt for chemotherapy treatments for sarcoids. There has been much debate over the role of bovine papilloma virus type 1 or 2 in equine sarcoids, but it is now fairly well-accepted in the veterinary world as a causative factor in the formation of sarcoids in horses.

Evidence suggests that sarcoids are transmitted by direct contact with infected objects and probably by insects, but cattle-to-horse transmission is of yet unclear due to the difficulty of propagating Papillomaviruses in standard laboratory tissue culture.

Last year, Swiss researchers discovered that the development of sarcoids appears to also have a genetic base, with scientists theorising that the disease occurs as a result of both genetic and environmental (Bovine Papillomavirus) factors. The identification of sarcoid-related genes is expected to bring a better understanding of the cause of the disease, and brings the development of a vaccine one step closer.

Indeed, researchers at the University of Glasgow, Scotland are studying ways of sending 'silencing' messages to viruses to halt gene activity and vaccine development for papillomavirus is also well underway – which is hoped to also prevent sarcoids and even squamous cell carcinomas (malignant skin cancers).

NB: No research has suggested any risk of sarcoids from housing horses with cattle or on land previously inhabited by cattle.

## NEWSFLASH

Scientists in the UK have discovered a new papillomavirus that may be the cause of equine genital cancer, an aggressive type of skin cancer that affects male and female horses of all breeds.

Tim Scase, BSc, BVM&S, PhD, MRCVS, Dipl. ACVP and his team isolated *Equus caballus papillomavirus type 2 (EcPV-2)* from tissues samples of genital tumours in both male and female horses – the second most common equine cancer.

"These results demonstrate for the first time that a previously undiscovered virus is likely causing one of the most serious cancers that affect horses," Scase, a veterinary pathologist, is quoted as saying.

Given that Papillomaviruses have been linked to both genital warts and genital cancers in people, Scase thought it plausible that a

similar virus might be causing these warts in horses, and that the more aggressive cancers might develop as a result of the viral infection.

He said that with EcPV-2, the progression from benign wart to malignant squamous cell carcinoma is likely through the effects of persistent viral infection and other factors.

Although surgical removal of the warts can be performed before there is any progression to cancer, the virus often infects cells next to the wart and it can potentially reactivate.

Scase warned owners of horses with genital warts to be aware of the added risk of the animal developing squamous cell carcinomas in the future.

The ground-breaking discovery has opened the door to new preventive strategies and the possibility of developing a vaccine to prevent the dangerous cancers later in life.

NB: The study, "Equus caballus papillomavirus-2 (EcPV-2): an infectious cause for equine genital cancer?" was published in the November 2010 Equine Veterinary Journal.

## SUMMARY

Ultimately, warts are a fairly trivial disease, provided the horse is given good nutrition and care. In most circumstances, the infection is self-limiting and there should be no complications. The key to managing warts is management of the horse itself and limiting the spread of the disease to other horses.

Always remember though that there are many problems that can affect a horse's skin - from insect allergies to fungal, viral, or bacterial infections; and even minor ones should be properly diagnosed and monitored to make sure they don't become major – and that translates to a veterinary examination right from the start. Dermatologic conditions in horses are notoriously difficult to diagnose and treat and as demonstrated, veterinary researchers are continually learning more about equine skin.

If a skin condition doesn't resolve within two to three days, it's essential to call in the Vet.

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