EQUINE DERMATOLOGY

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EQUINE PASTERN DERMATITIS (EPD)
(Also known as);
Mild Form - Scratches, Mud Fever, Mud Rash
Exudative Form - Grease Heel, Dew Poisoning
Chronic Proliferative Form - Grapes

Equine Pastern Dermatitis (EPD) is not a single disease, but a cutaneous reaction pattern of the horse. EPD should be considered a syndrome, rather than a diagnosis. Uncovering the underlying etiology prior to treatment is very important to minimize treatment failures and frustration of both the client and practitioner.

PATHOGENESIS OF EPD

CLINICAL SIGNS

EPD can affect any breed of horses, but is most commonly seen in Draft horses. Feathering over the pasterns is a predisposing factor. It occurs without a sex predilection and is seen mostly in adult horses. The dermatitis usually affects the caudal aspect of the pasterns, with the hindlimbs most commonly affected. If not addressed, the lesions can spread dorsally and anteriorly involving the front of the pastern and fetlock areas. The lesions are bilaterally symmetrical, however, they can affect just one limb. Lesions are more often detected on, but not limited to the non-pigmented areas of the pasterns. The lesions will vary depending on the etiology, duration and previous therapy. Initially, there is edema, erythema and scaling which rapidly progresses to exudation, matting of the hair, and crusting. If the underlying cause is vasculitis, ulcers may be noted. Secondary bacterial infection is a common complication and perpetuating factor. With chronicity the skin may become thickened and fissured due to the constant movement and flexion in this area. The lesions are often painful and can result in lameness. There are 3 different presentations: (1) Mild Form-(Scratches, Mud Fever, Mud Rash). This is the mildest and most prevalent form of EPD. There is alopecia, dry scales, and crusts. The skin can be thickened, and pruritus and pain is variable. (2) Exudative Form-(Grease Heel, Dew Poisoning). This type is a more exudative form of EPD. You may observe erythema, erosion, alopecia, and serous to purulent crusting dermatitis. Often accompanying epidermolysis and vasculitis are present. (3) Chronic Proliferative Form- (Grapes, Verrucous pododermatitis). This form is characterized by excessive granulation tissue (fibroblastic proliferation) that becomes cornified. Nodular proliferations of hyperkeratosis and lichenification can be seen. Fissures and papillomatous areas may develop and their formation is a common sequela in Draft breeds.

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DIAGNOSIS
A detailed history is very important in the dermatologic work up of EPD. Important pieces of information include; age of onset, month of the year that problem was noted, whether the EPD has been seasonal/nonseasonal or pruritic/nonpruritic. Additional questioning should include use of any topical medications or home remedies prior to your examination. Details should include what topical and systemic medications have been used and if lesions improved or worsened with each treatment. Environmental conditions can be a predisposing or primary factor in EPD, and when possible a detailed description or personal inspection of environment (bedding, pasture, sand, insect burden, moisture) should be done. Primary irritant and allergic contact dermatitis may involve the pastern region. Chronic exposure to moisture such are wet bedding or muddy pastures appears to be the most common cause for irritant contact dermatitis. Draft horses have long hair in the fetlock and pastern region which increases the retention of moisture and contributes to the maceration of the skin. Usually, in cases of contact irritant or allergic dermatitis all four pasterns are affected. Be sure to ask whether or not other animals or humans in contact with the affected horse, are affected as well (infectious or zoonoctic, i.e. dermatophytes).

Pastern folliculitis/pyoderma is caused by two main types of bacterial infections in the horse: Staphylococcus aureus and Dermatophilus congolensis. Initially, papules and/or pustules (rare) will be noted with a staph infection, however with chronicity they may not be seen. A biopsy for culture would be needed for a definitive diagnosis. The area would need to be surgically scrubbed and biopsy taken with sterile precautions. Taking a swab of the area and culturing can be misleading due to surface contamination. Dermatophilus congolensis may also cause pastern dermatitis. The lesions typically is crusting and exudative and when crusts are removed the skin is ulcerative. A requirement for this organism to cause infection is chronic moisture and trauma. Please see below for collection, staining and microscopic examination for this organism.

Dermatophytosis (Trichophyton equinum) rarely causes pastern folliculitis, however it is important to rule out. A definitive diagnosis requires a positive DTM culture in conjunction with positive microscopic identification of macrocondia.

Chorioptic mange may be the underlying cause of pastern dermatitis and must be excluded. Draft horses are predisposed due to the long hairs over their pasterns. This condition is intensely pruritic. Affected horses may constantly rub the area, and often are observed stamping his feet. This should be highly suspected if others in contact are affected and have clinical signs of pruritus. Mites are easily identified if infested.

Both systemic and contact forms of photosensitization may involve the pastern regions of the horse with white extremities. When contact is involved usually just the muzzle and extremities are involved. Primary photosensitization is due to a preformed or metabolically derived photosensitizing agent reaching the skin by ingestion, contact or injection. Hepatogenous photosensitization is due to blood phylloerythrin levels that are elevated in association with liver abnormalities and a photodynamic agent. Each type will cause dermatitis in the presence of UV light. The most common cause of equine contact photosensitization is exposure to clover pastures. Other causes of primary photosensitization are Saint John’s Wort (Hypericum perforatum), Buck wheat (Polygonum fagopyrum), and Perennial rye grass (Lolium perenne).

Pastern Leukocytoclatic Vasculitis (PLV) (; Photo-aggravated vasculitis) is an additional clinical cause of EPD. This disease is poorly understood and affects mature horses. It is unique to the horse and only affects unpigmented distal extremities. The clinical signs suggests it is UV light induced and primarily is seen in the summer. Lesions are multiple and consist of well-demarcated circular painful, erythematous, exudative, tightly adherent crusts. Edema of limb and lameness is a common sequela. Chronic cases may develop a rough or warty surface.

DIAGNOSTICS

Superficial Skin Scrape
Rule out superficial mites. Especially Chorioptes spp. This can be done using a #10 blade (doll). Superficially scrape crusts and debris onto slide or others recommend using a stiff scrubbing brush or denture type tooth brush to sweep the dander, crusts and debris into a container. Examine immediately under the microscope 10X objective, placing debris in mineral oil and using a cover slip. Some authors suggest using an insecticide because these mites are very fast.

Acetate Tape Prep-Diff Quik
Evaluate for secondary infections-Staphylococcus spp. By looking for cocci shaped bacteria +/- degenerative neutrophils with intra and extracellular cocci. The recommended tape is Scotch 3M Gloss Finish, Multitask Tape. Collect your sample and the stain with Diff Quik. Observe under microscope at 100X.

Direct Examination of Hairs
Hair sampling to evaluate for dermatophytes is performed by plucking affected hairs with hemostat, place on slide and apply 1-2 drops of a clearing agent-(10% Potassium hydroxide (KOH) solution, and apply a cover slip. Warm the slide for 15-20 minutes, and evaluate hair shafts. First, under 4X evaluate hairs, infected hair will appear pale and swollen. Second, re-examine under 40X for arthrospores within the hair shaft; these will appear as small clear bubbles in the hair shaft. This is difficult as well as time consuming and will take awhile to become experienced with this technique.

Dermatophyte Test Media (DTM culture)
When obtaining hair and crusts samples for a dermatophyte culture one must add few drops of niacin (Vitamin B complex) to all DTM’s to satisfy the growth requirements of Trichophyton equinum, regardless of in-house culture or sending to laboratory. When preparing the site to take a culture, the use of Isopropl alcohol to cleanse the hairs of saprophytic (clinically irrelevant) fungi. It is very important to allow the alcohol to dry prior to collection or you may experience a false negative result. Dermatophyte Test Media (DTM) will suppress growth of saprophytes and contaminant bacteria because it contains chlorotetracycline, gentamycin, and cyclohexamide. There is a phenol red pH indicator also included within the media. Dermatophytes use protein first, creating alkaline metabolites and RED color change CONCURRENTLY with colony growth. False-positive color changes occur, when saprophytes have exhausted the carbohydrate source on the plate, they will then utilize protein and cause a late red color change. False-
negatives occur (rarely). Once you identify the red color change concurrent with colony growth, microscopic examination is important to confirm your diagnosis. The procedure is as follows: Typically 7-10 days of growth on the media is required before macroconidia are visualized. Use clear cellophane tape and press lightly onto your colony within the DTM. Then apply 1-2 drops lactophenol cotton blue. You may examine immediately under your microscope at 40X. If there are no macroconidia visible, wait a few days for the colony to mature and re-examine.

**Dermatophilosis congolensis**

**Preparation**
Place 1-2 drops of saline on a clean slide. Clip off excess hair from the crust sample and place crust into saline. Allow sample to macerate/soften for a 15 minutes and then remove larger pieces. Crush out the remaining material on the slide and allow to air dry. Heat fix slide for a few seconds. Stain with Diff Quik or Methylene blue. Allow to dry and examine under microscope 100X oil and with immersion you should visualize coccic-shaped bacteria in a "railroad track" orientation.

**Biopsy**
Considered if immune mediated disorders or neoplastic conditions are suspected. Consideration of these differentials is also recommended when treatment has been pursued and failures or relapses have occurred. In most cases, especially a suspected PLV, skin biopsies should be read out by a dermatohistopathologist with an interest in equine skin diseases. Acute changes including leukocytoclastic vasculitis, thrombosis and vessel wall necrosis are often scarce and can easily be overlooked, and when present may provide a diagnosis. Vessel wall thickening and hyalinization, along with epidermal hyperplasia or papillomatous, may be detected in chronic lesions. If secondary bacterial infection is severe, it is recommended to clear this before taking the biopsy.

**Biopsy for Culture**
This may be necessary if bacterial or fungal infection is suspected or not responding to appropriate therapy. When collecting a biopsy for culture it is important to clip the hair and scrub the superficial area as if you were to perform a surgical procedure. The biopsy is taken as sterile precautions are maintained and the sample placed in a sterile cup or sterile media. This should be sent to the lab as soon as possible. Otherwise, superficial contamination will compromise your results.

**Complete Blood Count and Chemistry Panel**
This may useful in helping to rule out hepatogenous photosensitization disorders & other metabolic illnesses

**MEDICAL TREATMENTS**
Choosing the appropriate therapy involves recognition and identification of predisposing, perpetuating and primary factors.

**ENVIRONMENT**
Recommendations include considering if the environment is contributing to a primary underlying problem. (1) Pastures and paddocks with mud, water or sand can predispose, and worsen the condition. (i.e. Arabian horses and sand). (2) Keep horses in clean dry stalls during wet weather. (3) Do not release horses into pasture until the morning dew has dried. (4) If you suspect contact allergic (affecting all pasterns), suggest alternate source of bedding (the treated or aromatic types of wood shavings contain chemicals that can cause contact hypersensitivity). (5) If a horse has heavy hair feathers, clip feathers over the pasterns to decrease moisture retention. (6) If you suspect PLV, avoid UV light exposure with stabling or wraps.

**TOPICAL THERAPY**

**Antibacterial** - In EPD secondary bacterial infections with *Staphylococcus spp.* are often a common problem that often complicates the diagnosis. The antibacterial shampoo are recommended by the author is Benzoyl Peroxide 2% (Micropearls® Vetoquinol). Ethyl Lactate, (Etiderm®, Virbac), or Chlorhexadine 2%, (Chlorhexadem®, DVM) are available as well. Shampoo area 1-2 times daily, lather, leave on 10 minutes, rinse and dry well. This should be done for 7-10 days, then to 2-3 times weekly. Protect the affected pasterns. Dry environment/ without bandaging is the most effective treatment. Some dermatologists recommend using a padded, water repellent bandage (changed q 24-48 hours). Facilitator® (Blue Ridge Pharmaceuticals) is a hydroxyethylated amylpectin liquid bandage which has been used successfully by some when applied every 1-3 days after cleansing. If lesions are exudative, astringents solutions, such as lime sulfur (Lym Dyp®) (4-6 ounces/gallon) or aluminum acetate solution can be used. These agents will cause drying to the area and less exudation.

A topical ointment is available for treating localized bacterial infections. Bactoderm®, Pfizer (2% mupirocin ointment) has excellent penetration into the epidermis and can be used for both dermatophilosis or staph bacterial infections. Close clipping and cleansing is paramount to success with any ointment.

**Antifungal** - Lime sulfur dips and spray can be used for localized treatment of the pastern for dermatophytes and mites. Enilconazole (Imaverol®) labeled for use in horses in many countries other than the United States and is used to treat fungal infections with good success. Miconazole shampoo 1% (Micropearls®, Vetoquinol) or Malaseb (DVM) which contains both miconazole and chlorhexadine can be used.

**SYSTEMIC THERAPY**
The most common antibiotic used in the horse is Trimethoprin Sulfur (15-30 mg/kg). If this bacterial infection is severe a 2-3 week course may be necessary, often in conjunction with topical antibacterial shampoos. Monitor closely for signs of colitis/diarrhea and discontinue immediately if noted. Some dermatologists recommend Enrofloxacine 5 mg/ kg every 24 hours. This drug should never use in foals.

Systemic antifungal therapy is often unnecessary in the horse. Griseofulvin powder (Fulvicin-U/F Powder, Schering-Plough) is available for the horse. However, there has been no pharmacokinetic data published and it’s efficacy is questionable. Ketoconazole (30mg/kg) has very low absorption (23%) from the gastrointestinal tract in horses and can be very expensive. In addition, Itraconazole and Fluconazole can be used. Recommended dose for Itraconazole is 5-10 mg/kg. One published report using Fluconazole in the horse recommends a loading dose of
14mg/kg/day, then 5 mg/kg/day can be used safely. The cost of these medications limits their use.

ANTI-PARASITIC THERAPY
Ivermectin (1% solution)-Give 300 mcg/kg PO weekly for 4 doses. May need to repeat and treatment failures can occur. Treat affected and all contact animals. Topical treatment are labor intensive, but effective. Topical organophosphates such as malathion (0.5%) and coumaphos (0.06%) or topical permethrin can be effective. Some authors suggest Selsun Blue® (selenium sulfide) shampoo followed by lime sulfur (Lym Dyp®) dips (6 ounces/gallon), sponged on every 5 days for 1 month. Fipronil spray (Merial®) (0.25%) has been shown to be effective against Chorioptes bovis in one study. These mites can live off the host up to 70 days, so environmental decontamination is important, including barn, stalls and bedding, tack and grooming equipment.

IMMUNOSUPPRESSIVE/ IMMUNOMODULARY THERAPY
Immune mediated conditions such as pastern leukocytoclastic vasculitis may need to be treated with immunosuppressive doses of steroids as well as decrease the exposure to UV light. Typically, dexamethosone, 0.1-0.2 mg/kg every 24 hours for 7-14 days, then taper slowly over the next 4-6 weeks. Pentoxifylline, 8-10 mg/kg PO, has immunomodulating properties and has been reported to be successful in a few cases. Long term control can often be achieved using topical steroids once the lesions are under control.

The prognosis of EPD depends on the underlying cause and ability to identify it and the chronicity of the condition. Ensuring that predisposing, primary and perpetuating factors are taken into consideration during your diagnostic work-up and treatment plan will optimize a positive outcome.

REFERENCES
5. Littlewood JD. Dermatosis of the equine distal limb. Proceedings of the 4th World Congress of Veterinary Dermatology; 2000; 129-133.