

Interdigital Cysts
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Interdigital cyst is a term that actually refers to interdigital furunculosis. Cyst is a misnomer. In order to understand interdigital furunculosis, we have to understand hair follicle anatomy. There is approximately 1 hair follicle unit for every 2mm of skin surface area. Epithelial cells that cover the skin surface also extend into each hair follicle. In other words, each hair follicle is lined with skin cells. Additionally, every hair follicle has a sebaceous gland attached to it. The sebaceous gland secretes oil into the follicle.

When the surface of the skin becomes inflamed, the lining of the hair follicle becomes inflamed, too. This causes the opening of the hair follicle to swell shut. The sebaceous gland continues to secrete oil into the follicle; however if the top of the hair follicle is swollen shut, there is no place for the oil to be released. Eventually, the hair follicle will be under so much pressure that it will burst underneath the skin. When the hair follicle bursts, bits of hair, epithelium, oil and bacteria are released into the dermis and subcutis. This elicits a foreign body response. The immune system sends a myriad of white blood cells to the site of the follicle rupture to try to clean up the mess. This results in further inflammation and swelling as the body attempts to remove hair follicle debris from the dermis and subcutis.

The result of interdigital furunculosis is deep infection, deep inflammation and the potential for scar tissue to develop.

In order to successfully treat interdigital furunculosis, we have to determine what caused it. Sometimes there is more than one cause. Here is a list of common differentials:

- *Plant awn
- *Demodicosis
- *Food allergy
- *Environmental allergy
- *Degenerative joint disease
- *Elbow dysplasia
- *Obesity that leads to conformational changes of the paw (often in conjunction w/ DJD)

Conformational changes in the paw can lead to one toe rubbing against the next, which starts the inflammation that leads to furunculosis.

Staphylococcus, *E. coli*, *Pseudomonas* and *Malassezia* are opportunistic microorganisms that perpetuate the furunculosis.

Treatment is multimodal. The clinician must treat the infection, the secondary inflammation and the primary cause.

The first step is to tape and scrape the lesions. If cocci is present, the clinician should consider treating with a cephalosporin. If rods are present, then antibiotic therapy should be based on a culture. If cocci bacteria persist despite treatment with a cephalosporin, then a culture should be procured. If yeast is present, the clinician should consider treating with a systemic antifungal.

The infection will require treatment that lasts a minimum of 4 weeks. The clinician will need to re-evaluate the lesions after 3 or 4 weeks of treatment to make sure that microorganism numbers and inflammation are decreasing. The infection should be treated for 2 weeks beyond when the skin looks normal (or as normal as it can get).

Sometimes treating the infection alone will lead to resolution of inflammation, but usually not. The clinician will often need to treat the inflammation directly. The inflammation involved in interdigital furunculosis is complex and as a result, broader spectrum anti-inflammatories are usually needed. For situations where the primary cause of furunculosis is allergy, Cytopoint® would be least likely to help. This is because Cytopoint only neutralizes one type of molecule (IL-31). With furunculosis, we expect a cacophony of inflammatory molecules to be involved.

Apoquel®, Atopica® and steroids can all be useful in reducing the inflammation associated with interdigital furunculosis. In general, steroids have the most anti-inflammatory activity, Atopica® has less anti-inflammatory activity than steroids, and Apoquel® has less anti-inflammatory activity than Atopica®.

Topical therapy can help speed healing of interdigital furunculosis. Topical steroids such as Synotic® (applied 2 to 4 times per day) can help reduce inflammation. Epsom salt soaks and/or gel (1 to 4 times per day) can help reduce edema.

Once the interdigital furunculosis has resolved, the clinician will be tasked with making a long term plan to help prevent recurrence. Often times this involves: controlling the underlying allergy (hyposensitization and diet changes can be quite helpful for long term), controlling weight, managing degenerative joint disease with physical therapy, supplements and medications, and daily antiseptic wipes between the digits to minimize bacterial overgrowth.

Unless the dog has demodicosis – then that changes everything ;-)