CANINE RECURRENT INTERDIGITAL ‘CYSTS’ (GRANULOMAS)

Interdigital ‘cyst’ are a common, recurrent problem in many dogs. Treating the secondary infections will often result in only a short to medium term resolution. Recurrence is very likely unless the primary cause is detected & treated. The paw(s) may be inflamed only, or inflamed and infected with any combination of microbes (bacteria &/or yeasts), and/or with parasites.

The factors, causing Pododermatitis, digital and interdigital inflammation and infection, can be divided into four categories - primary, predisposing, perpetuating & secondary – listed below. Examples of the most common causes are given:

**Primary causes**
These factors directly induce paw inflammation (pododermatitis):

- **Autoimmune Diseases**
  - Pemphigus foliaceus (uncommon)
  - Pemphigus vulgaris (very rare)
  - Epidermolysis bullosa (very rare)
  - Systemic Lupus Erythematosus (v rare)

- **Cornification Disorders**
  - Paw pad hyperkeratosis
  - Familial Hyperkeratosis

- **Endocrine**
  - Hyperthyroidism
  - Hyperadrenocorticism

- **Foreign bodies**
  - Grass seeds/awns (very common)
  - Thorns (hawthorn etc)
  - Loose hair, stone, sand, salt etc

- **Hypersensitivity**
  - Atopic dermatitis (common)
  - Adverse food reactions (food allergy or dietary intolerance)
  - Contact hypersensitivity (uncommon)

- **Immune-mediated**
  - Adverse Drug Reactions (uncommon)
  - Dermatomyositis (rare)
  - Idiopathic Sterile Granuloma/Pyogranuloma
  - Lymphoplasmacytic pododermatitis (primary or chronic end-stage?)
    - Ab-responsive (AbR-LPP)
    - Immunomodulatory responsive (ImR-LPP)
    - Symmetric Lupoid Onychodystrophy (or onychitis)
    - Vasculitides (uncommon)

- **Inflammatory**
  - Reactive histiocytosis

- **Metabolic**
  - Calcinosi s circumscripta
  - Hepatocutaneous Syndrome (Superficial Necrolytic Dermatit is)
  - Zinc Responsive Dermatosis

- **Microorganisms**
  - Bacteria esp. Mycobacteria (rare as primary cause)
  - Dermatophytosis - *Microsporum canis* etc (uncommon)
  - Malassezia Yeast (rare as primary cause)

- **Multifactorial**
  - Acr al lick dermatitis

- **Neoplasia**
  - Fibrosarcoma, systemic/malignant Histiocytosis, Epitheli o-tropic Lymphoma, Mast Cell tumour, Melanoma, Soft Tissue sarcoma, Squamous Cell carcinoma, atricial Sweat gland tumour, etc. & any metastases
Orthopaedic  
- Congenital limb deformity  
- Cruciate disease  
- Degenerate joint disease/osteoarthritis  
- Elbow/Shoulder osteochondrosis dissecans  

Postural  
- Abnormal Gait/Conformation  

Parasites  
- Demodex canis mites (common)  
- Hookworms (uncommon)  
- Leishmaniosis (uncommon)  
- Pelodera strongyloides (rare)  

Viral  
- Cowpox (cats)  
- Distemper (rare)  
- Papilloma  

**Predisposing factors**
These factors increase the risk of development of paw inflammation (pododermatitis) but may not directly induce it:

- **Genetic**  
  - Short haircoat  

- **Obstructive disease**  
  - Benign cutaneous neoplasia  

- **Orthopaedic**  
  - Congenital limb deformity  
  - Cruciate disease  
  - Degenerate joint disease/osteoarthritis  
  - Elbow/Shoulder osteochondrosis dissecans  

- **Physical**  
  - Excess bodyweight  
  - Large & Giant breed dogs  

- **Postural**  
  - Abnormal Gait/Conformation  

- **Systemic disease**  
  - Immune suppression  
  - Generalised neoplastic disease  
  - Debilitation and negative catabolic states  

Some of these factors can be considered Primary too.  
Increased weight bearing on haired palmar and plantar pad margins → tissue hyperplasia & hypertrophy → focal hairshaft trauma → furunculosis → subcutaneous keratin-driven inflammation (endogenous foreign body reaction)  

**Perpetuating causes**
These factors prevent complete resolution of the disease, sometimes permanently.  

- **Chronic, severe lymphocytic-plasmacytic inflammation**  
- **Persistent endogenous foreign body reaction (keratin)**  
- **Progressive pathological changes (from chronic inflammation and recurrent infections)**  
  - Destructive osteomyelitis  
  - Dermal fibrosis - scarring  
  - Epidermal hyperkeratosis  
  - Folliculitis and Furunculosis  
  - Glandular hyperplasia/dilatation  
  - Hidradenitis  
  - Hyperplasia & Hypertrophy  
  - increased epithelial folds  
  - abnormal new pad growth/conjoined pads  
  - Oedema – swelling
Secondary infections

Microbial infections, which are almost never primary, often cause the more acute clinical signs and this further progression leads to another visit to the Vet. 

- **Yeast**  
  *Malassezia pachydermatis, Candida sp.*

- **Bacteria**  
  *Staphylococcus pseudintermedius, (Streptococcus sp.)*  
  *Pseudomonas sp. (Proteus sp., Escherichia coli etc.)*

Therefore the more interdigital granulomas that a patient undergoes the more difficult it may be to reverse the progression of paw inflammation (pododermatitis).

Eventually permanent damage will ensue and surgical treatment will be the only option through re-referral to a specialist Soft Tissue Surgeon for major salvage surgery (surgical laser ablation or fusion podoplasty).