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COMPANION ANIMAL DERMATOLOGY REFERRALS IN SOUTH EAST ENGLAND
Dr Charlie Walker BVetMed CertVD CertAVP(VD) MRCVS
charliewalker@theskinvet.net
tel: 07947 711200
efax: 01273 371121
www.theskinvet.net

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	Hypothyroidism 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	Calcinosis circumscripta Hepatocutaneous Syndrome (Superficial Necrolytic Dermatitis) Zinc Responsive Dermatosis
Microorganisms	Bacteria esp. Mycobacteria (rare as primary cause) Dermatophytosis - *Microsporum canis* etc (uncommon) Malassezia Yeast (rare as primary cause)
Multifactorial	Acral lick dermatitis
Neoplasia	Fibrosarcoma, systemic/malignant Histiocytosis, Epitheliotropic Lymphoma, Mast Cell tumour, Melanoma, Soft Tissue sarcoma, Squamous Cell carcinoma, atrichial Sweat gland tumour, etc. & any metastases

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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

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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).