

# Case studies PetCell®



## Cold plasma therapy in small animal practice



**ActivCell**  
Group

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## Case studies

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## Case studies

### Dermatology

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## Case study dermatology

# Eosinophilic granuloma – Cat Zorro

Dr. med. vet. FVH, CVA, CHPV, MVPH Sabine Huber  
 Mobile Tierarztpraxis,  
 Berikon, Switzerland

Maine Coon, neutered male, 4 yrs

### Medical history

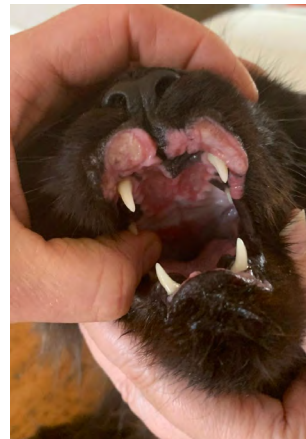
- Eosinophilic granuloma existing for 2.5 years on one paw, one hind leg and in the oral cavity
- Indolent ulcer on both upper lips for 9 months, both tarsi ulcerated, several toes swollen and ulcerated
- Conventional treatment approaches have led to partial healing. The chronic-intermittent course was partly caused by poor compliance on the part of the owners
- Start with PetCellpen® therapy in parallel with continuation of cyclosporine

### Therapy management

- PetCellpen® 1–2× weekly for 3 weeks, thereafter every 2 weeks 1× weekly, 2–5 min
- Glass electrode: Straight and curved
- Pulse frequency: 100 Hz
- Amplitude: 9
- Cyclosporine (now administered consistently)

### Result

- Paws are healed after 4 treatments and Tarsi after 5 treatments
- Lips are significantly better, further along in therapy



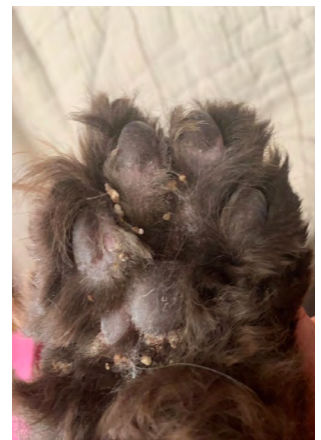
Mouth before



Paw before



Mouth after



Paw after

## Case study dermatology

### Nasal furunculosis – Dog Tori

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

St. Bernard, female, 5 yrs

#### Medical history

- Chronic recurrent furunculosis bridge of the nose for 2 yrs
- Otitis externa on both sides
- Food allergy

#### Therapy management

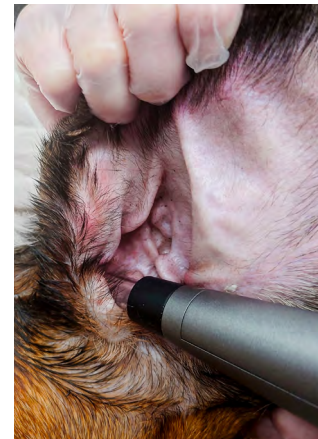
- Elimination diet
- **Bridge of the nose:** PetCellpen® 1x weekly for 3 weeks, 90 s per spot
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 8
- **Ears:** PetCellpen® once under anesthesia after ear irrigation for 2 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 6
- Hypochlorous acid ear cleansers, clotrimazole-dexamethason-marbofloxacin ear drops, marbofloxacin

#### Result

- The bridge of the nose is completely healed after 3 treatments
- Ears healed after 5 weeks with combination therapy of PetCellpen® at the beginning and local medication



Before



Ear treatment under anesthesia



After

## Case study dermatology

# Histiocytoma – Dog Roxy

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Cockapoo, neutered female, 3 yrs

### Medical history

- Weeping ulceration on the bridge of the nose
- Cytology: Dominated by histiocytes and neutrophil granulocytes
- Diagnosis: Ulcerated and infected histiocytoma

### Therapy management

- PetCellpen® once, 10 min
- Glass electrode: Straight
- Pulse frequency: 100 Hz
- Amplitude: 9
- Chlorhexidine pads, polycresulen ointment

### Result

- Healed without complications within 2 weeks



Before



After

## Case study dermatology

### Chin furunculosis – Cat Robin

---

vetderm.ch – Dermatology and Allergology for Animals, Dr. med. vet. Dipl. ACVD & EBVS®  
European Specialist in Veterinary Dermatology  
Claudia S. Nett-Mettler

ESH, neutered female, 10 yrs

#### Medical history

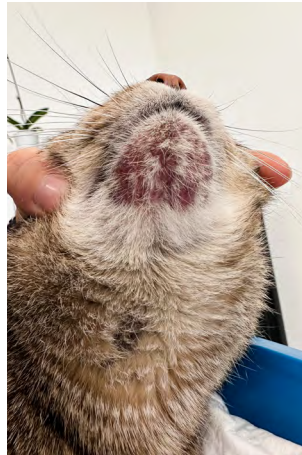
- Referred for chronic chin furunculosis for 3 months
- Pretreatment: 2× cefovecin, cortisone and prednisolone for 3 weeks, then cleavage of microabscesses and continued with cefovecin and prednisolone for 1 month
- Got better, but relapsed within a few days after tapering off prednisolone
- Dermatological findings chin: Swelling, erythema, hypotrichosis and 3 active boils with serosanguinous fistula exudate
- Diagnostics: Trichogram: Negative, cytology: Pyogranulomatous inflammation, + eosinophils and ++ cocci

#### Therapy management

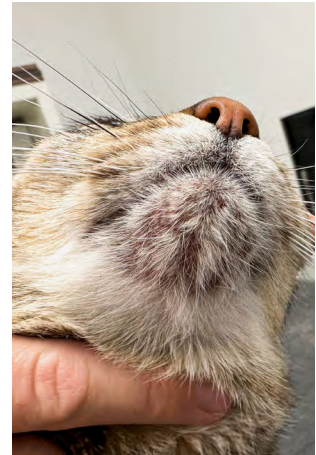
- Black tea local SID
- PetCellpen® 2× weekly for 2 weeks
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 2–4

#### Result

- Healed without complications after 2 weeks



Before



After

## Case study dermatology

# Trichophytosis lips and ear – Dog Jara

Dr. med. vet. FVH Daniel Bösch  
Tierklinik Lindenhof,  
Obereggen-Muolen, Switzerland

Bergamasco x Bernese Mountain Dog, neutered  
female, 1.5 yrs

### Medical history

- Farm dog
- Therapy resistant bloody crusts on both ears with roundish alopecia without itching as well as ulcerated areas on the lips on both sides
- Pretreatment: Miconazole-nitrate-polymyxin B-prednisolone ointment for several weeks
- Trichophyton PCR positive

### Therapy management

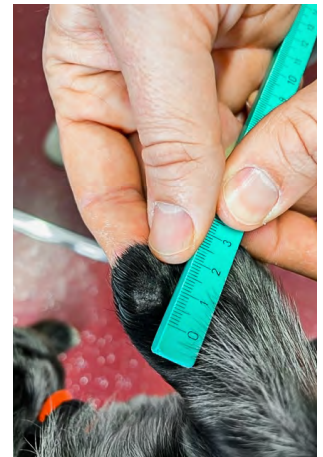
- PetCellpen® 2x weekly for 2 weeks, 3-5 min per site
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 4-6

### Result

- Skin changes almost healed after only 2 weeks



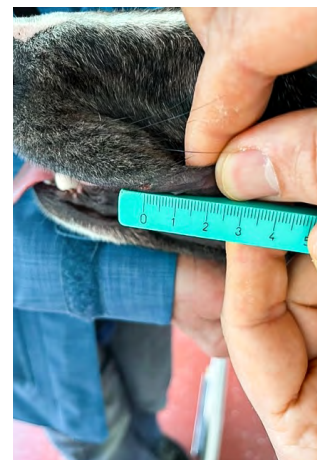
Ear before



Ear after



Lips before



Lips after

## Case study dermatology

### Pyodermia above the eye – Cat Melodie

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

ESH, neutered female, 1 yrs

#### Medical history

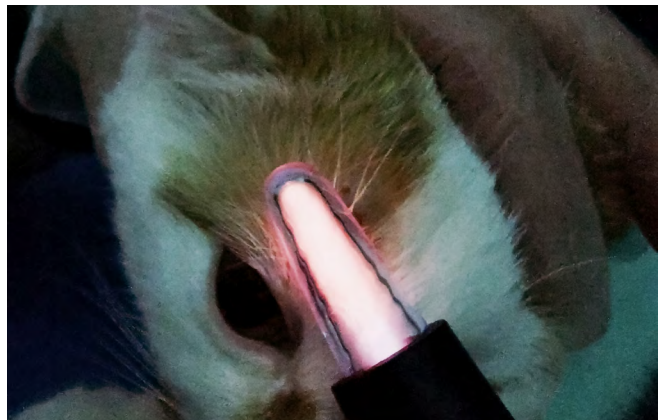
- Weeping pyoderma above the eye
- Patient has had AB several times due to infected bite injuries
- Topical treatment with ointments difficult due to localization
- Goal: To treat without antibiotics

#### Therapy management

- PetCellpen® 2× in 3 days, 5–10 min  
1× after 7 days
- Glass electrode: Straight
- Pulse frequency: 80 Hz
- Amplitude: 4–6
- Very good therapy tolerance

#### Result

- Healing control after another 10 days:  
Complete healing



*After initial therapy*



*After 7 days*

## Case study dermatology

# Hotspot – Dog Firra

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Labrador, female, 4 yrs

### Medical history

- Weeping hotspot in front of the ear on the left
- Pretreatment: Antibiotic and fusidic acid-  
betamethasone ointment
- Owner's wish: Therapy without antibiotics  
if possible

### Therapy management

- PetCellpen® as sole therapy 2× weekly  
for 2 weeks, 5 min
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 8

### Result

- Itching and inflammation are significantly  
better after the first treatment
- Healed after 2 weeks



*Before*



*After 1 week*



*After 2 weeks*

## Case study dermatology

### Hotspot – Dog Moritz

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Labrador, male, 5 yrs

#### Medical history

- Allergic dog
- Weeping hotspot in front of the right ear for over a month
- Pretreatment: Amoxicillin-clavulanic acid, octenidine dihydrochloride, manuka honey
- Bacteriology: Staphylococcus pseudintermedius, penicillin-resistant

#### Therapy management

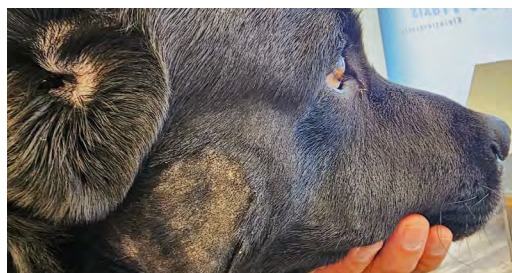
- PetCellpen® 1–2× weekly for 5 weeks, 10–15 min
- Glass electrode: Straight and disc
- Pulse frequency: 100 Hz
- Amplitude: 9
- Chlorhexidine pads

#### Result

- Healed without complications



*Before*



*After*

## Case study dermatology

# Papillomavirus-induced focal feline plaque – Cat Amiris

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Maine Coon, neutered female, 9 yrs

### Medical history

- Inside of ear: Papillomavirus-induced focal feline plaque

### Therapy management

- PetCellpen® 1× weekly for 4 weeks, 10 min
- Glass electrode: Straight and curved
- Pulses: 100 Hz
- Amplitude: 6–8
- Chloramphenicol-nitrofurazone-prednisolone spray

### Result

- Complete healing after 5 weeks



*Before*



*Before the last treatment*

## Case study dermatology

### Vasculopathy of the pinnae – Dog Guinness

vetderm.ch – Dermatology and Allergology for Animals, Dr. med. vet. Dipl. ACVD & EBVS®  
European Specialist in Veterinary Dermatology  
Claudia S. Nett-Mettler

Beauçeron, neutered male, 9 yrs

#### Medical history

- Referred for therapy resistant idiopathic thrombovascular necrosis of the pinnae for 1 year
- Comes from Austria, otherwise no foreign anamnesis
- Pretreatment: Prednisolone, pentoxiphylline
- Dermatological findings: Inconspicuous except for the ears, bilateral necrosis of the ear margin with tissue loss at the tips of the pinnae, erosions, ulceration and thick crusts

#### Therapy management

- Pentoxiphylline dose increased
- PetCellpen® 1× weekly for 3 weeks, 1 min
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 4-6
- Plaster for covering

#### Result

- Healed after 3 weeks, then reduction of pentoxiphylline. Recurrence after 10 days with renewed bleeding, scabs, ulceration
- Again with the PetCellpen® (glass electrode: Disc, pulse frequency: 100 Hz, amplitude: 6-8) and argon plasma, dose increase of pentoxiphylline, local therapy with colloidal silver and ointment from essential oils
- Healed then, but pentoxiphylline still needed



Before



After

## Case study dermatology

# Sterile furuncle on elbow and tarsus – Dog Mats

vetderm.ch – Dermatology and Allergology for Animals, Dr. med. vet. Dipl. ACVD & EBVS®  
European Specialist in Veterinary Dermatology  
Claudia S. Nett-Mettler

Beauçeron, male, 7 yrs

### Medical history

- Chronic, non-healing wounds on the elbow and tarsus on the left, wound on the tarsus not healing for 6 months
- No medication at the moment, overnight bandage
- Pretreatment: Amoxicillin/clavulanic acid for 3 weeks and meloxicam, not really better with this treatment
- Dermatological examination: On the left elbow callus skin alopecic and edematous with 2 superficial wounds, lateral metatarsus highly inflamed and edematous with multiple fistulas with a large amount of serohemorrhagic exudate, alopecic, edematous and spongy, cytology: Severe pyogranulomatous inflammation with eosinophils, no bacteria
- Diagnosis: Sterile pyogranulomatous furunculosis

### Therapy management

- Prednisolone and locally applied phenolsulfonic acid-phenol-urea-formaldehyde condensate
- PetCellpen® 2–3× weekly (owner has rental equipment) for 8 weeks, 4–5 min
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 6–8
- Shampoo 1× weekly

### Result

- After the first PetCellpen® application, the elbow callus has already been calmed down, no more bleeding, 1 active fistula remains on the

tarsus

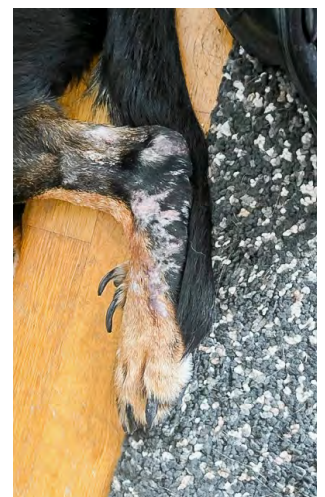
- Owner has reported that their pet has severe itching after using the PetCellpen®
- Checkup after 1 month: Great improvement, elbow is completely healed, on the tarsus there are still 3 active fistulas
- Allergy assessment: Exclusion diet for possible underlying food allergy



Before



Before



After

## Case study dermatology

### Lick ganuloma carpus – Dog Nora

---

Dr. med. vet. FVH Daniel Bösch  
Tierklinik Lindenhof,  
Oberegg-Muolen, Switzerland

Hovawart, female, 11 yrs

#### Medical history

- Chronic thickened carpus due to licking
- 2 yrs ago, further tests were undertaken (mixed cell inflammation) and treated with cefalexin and prednisolone
- Current: Leakage of sero-sanguinous fluid from several openings, cytologically mainly neutrophils, no pain

#### Therapy management

- PetCellpen® 2× weekly for 4 weeks, 4 sites of 90 s each
- Glass electrode: Curved
- Pulse frequency: 100 Hz
- Amplitude: 8–9

#### Result

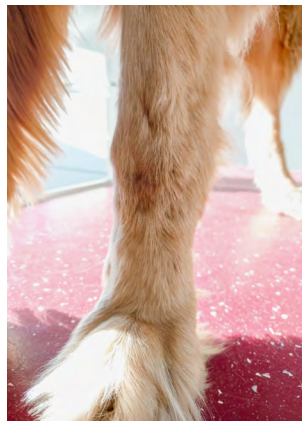
- Healed without complications



*Before*



*Last treatment*



*11 weeks after treatment was initiated, 7 weeks after cessation of PetCellpen® therapy*

## Case study dermatology

# Abscess caused by plasma cellular pododermatitis – Cat Jimmi

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

ESH, neutered male, 9 yrs

### Medical history

- Plasma cellular pododermatitis on cortisone for years
- FeLV/FIV negative
- Chronic recurrent abscess on one paw
- Resistance to therapy despite various antibiotics according to antibiogram
- Trial of long-term therapy with tetracycline is underway

### Therapy management

- PetCellpen® during surgery 10 min and 1x 10 min when dressing is changed
- Glass electrode: Curved
- Pulse frequency: 100 Hz
- Amplitude: 8
- Continue tetracycline

### Result

- Significant improvement can be seen after just 5 days
- Progression wound healing well, fully healed after 2 weeks
- No new abscess developed



Before



3 weeks after surgery

## Case study dermatology

### Hotspot – Dog Baddy

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Bohemian shepherd, neutered male, 7 yrs

#### Medical history

- Recurrent hotspots
- Special diet due to food allergy
- Regular flea and tick prophylaxis
- Because of the GI side effects, the owners want to do without a new course of antibiotics

#### Therapy management

- PetCellpen® 1–2× weekly for 5 weeks, 15 min
- Glass electrode: Curved, straight and disc
- Pulse frequency: 100
- Amplitude: 8
- Polycresulen ointment, chlorhexidine pads

#### Result

- Healed after 5 weeks



Before



After

## Case study dermatology

# Hotspot – Dog Luna

---

Dr. med. vet. FVH Juna Gutknecht  
Tierzentrum Tierärzte GmbH,  
Basadingen, Switzerland

German shepherd, neutered female, 5 yrs

### Medical history

- Large hotspot in the flank on the left for 2 days

### Therapy management

- PetCellpen® as sole therapy 3× weekly for 1 week, 4–6 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 8–9

### Result

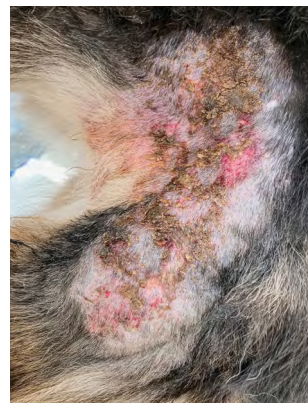
- All dried after first treatment
- Itching significantly reduced after first treatment
- Healed after 3 treatments



*Before 1st treatment*



*Before 2nd treatment*



*Before 2nd treatment,  
after crust removal*



*Before 3rd treatment*

## Case study dermatology

### Interdigital dermatitis – Dog Lord

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Pug, neutered male, 11 yrs

#### Medical history

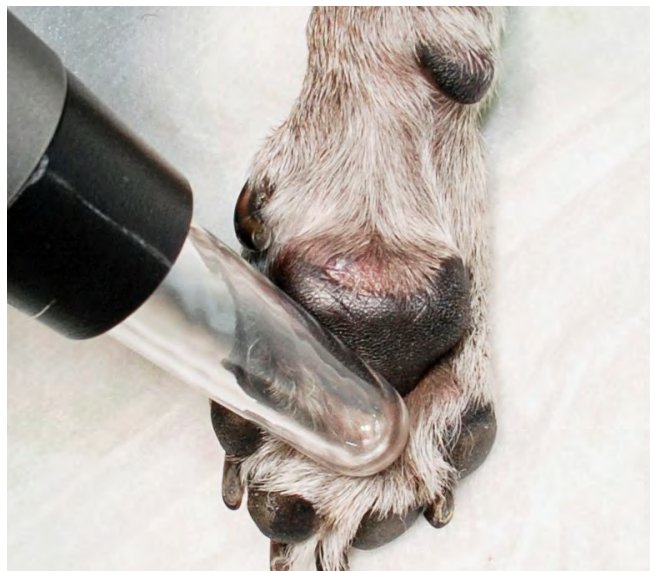
- Interdigital dermatitis after food change
- History of repeated ABx due to respiratory infections
- Goal: To treat without antibiotics
- Changing the food again

#### Therapy management

- PetCellpen® 2× weekly for 1 week, 90 sec per site
- Glass electrode: Straight
- Pulse frequency: 100 Hz
- Amplitude: 4

#### Result

- Control after one week: Almost completely healed



## Case study dermatology

# Furunculosis – Dog Lea

---

Dr. med. vet. Marie Müller  
Tierarztpraxis Emmevet,  
Hasle-Rüegsau, Switzerland

German shepherd, neutered female, 9 yrs

### Medical history

- Oclacitinib and prednisolone for years
- Recurrent lick dermatitis
- Pretreatment: lick protection, fusidic acid - beta-methasone gel and amoxicillin – clavulanic acid
- After 2.5 weeks of conventional therapy, no healing has yet occurred

### Therapy management

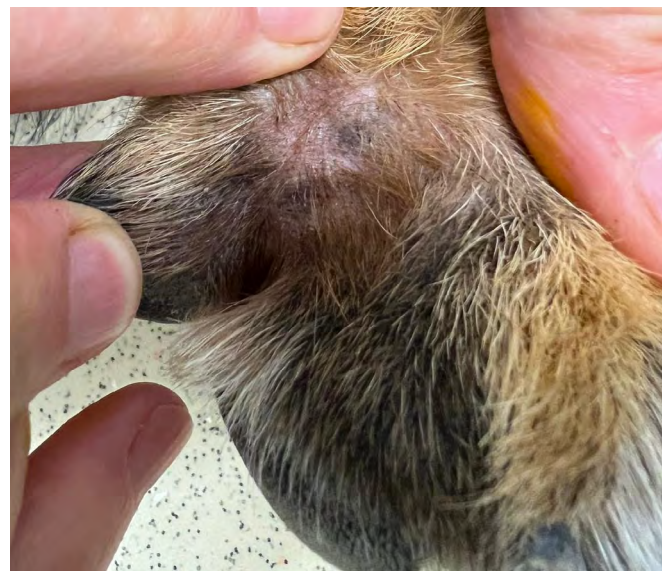
- PetCellpen® 1–2x weekly for 2 weeks, 90 s
- Glass electrode: Curved
- Pulse frequency: 100 Hz
- Amplitude: 9
- Lick protection

### Result

- Healed after 3 cold plasma treatments



Before



After

## Case study dermatology

### Scrotum pyoderma – Dog Kyle

---

Dr. med. vet. FVH Daniel Bösch and  
Dr. med. vet. Fabienne Veillard  
Tierklinik Lindenhof,  
Oberegg-Muolen, Switzerland

American Collie, male, 11 months

#### Medical history

- Scrotum inflamed and painful due to licking
- Pretreatment: Cefalexin, carprofen and chlorhexidine locally

#### Therapy management

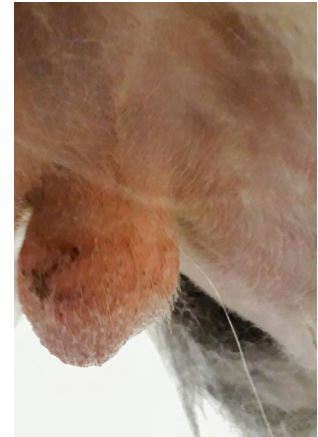
- Due to vomiting, antibiotic therapy was discontinued prematurely. Treatment was switched to 2× PetCellpen® applied at intervals of 3 days, 90s per site
- Glass electrode: Disc
- Pulse frequency: 80–100 Hz
- Amplitude: 8–9

#### Result

- Healed without complications



*Before*



*After*

## Case study dermatology

# Fistulising anal gland inflammation – Dog Logan

---

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Animals, Dr. med. vet. Dipl. ACVD & EBVS®  
European Specialist in Veterinary Dermatology  
Claudia S. Nett-Mettler

White shepherd, male, 6 yrs

### Medical history

- Chronic fistula for several months after  
an anal gland abscess on the left

### Therapy management

- PetCellpen® 2× weekly for 2 weeks, 3–4 min
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 8–9

### Result

- Fistula almost closed after the first treatment



## Case study dermatology

### Anal gland abscess with fistula – Dog Beans

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Pomeranian mix, neutered male, 8 yrs

#### Medical history

- Recurrent anal gland abscesses for the last 1.5 yrs
- Chronic problem with fistula development
- Repeated courses of antibiotic and rinses
- Locally applied antibiotic ointments
- Therapy resistant

#### Therapy management

- PetCellpen® 2x weekly for 1.5 weeks, 10 min
- Glass electrode: Curved
- Pulse frequency: 100 Hz
- Amplitude: Increasing 6 to 9
- Rinsing with policresulen during initial treatment

#### Result

- Heals within 3-4 weeks



## Case study dermatology

# Inflammation of the tail gland (supracaudal gland) – Dog Niamh

Dr. med. vet. Leslie Wohlgroth  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Labradoodle, neutered female, 11 yrs

### Medical history

- Painful chronic inflammation of the tail gland
- Abscess
- Comedone formation locally and generalized on the body
- Operated once 2 yrs ago (excision)
- The owner is not considering another operation for the pet

### Therapy management

- Emptying of the largest comedones during initial treatment
- PetCellpen® 2x weekly for 2 weeks, 20 min
- Glass electrode: Curved
- Pulse frequency: 100 Hz
- Amplitude: 6–9

### Result

- Heals within 2 weeks



*Initial treatment*



*After initial therapy*



*After 2 weeks*

## Case study dermatology

### Hotspot on the tail – Dog Toby

---

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European Specialist in Veterinary Dermatology  
Claudia S. Nett-Mettler

Springer spaniel, male, 9 yrs

#### Medical history

- Had furunculosis over the supracaudal gland, which has healed
- New: Gnawing on the tail, around supracaudal gland papules, crusts and erosions
- Pretreatment: Local therapy with hydrocortisone spray, shampoo with chlorhexidine and miconazole, zinc- and copper-sulfate-zinc-oxide ointment
- Neck collar at night, bandage during the day

#### Therapy management

- PetCellpen® 1–2× weekly for 2 weeks, 3 min
- Glass electrode: Disc
- Pulse frequency: 100
- Amplitude: 9
- Continue with the chlorhexidine and miconazole shampoo every 2 days

#### Result

- Healed after 2 weeks



Before



After 4 days



After

## Case studies

### Wound healing

---



## Case study wound healing

### Bite injury on the ear – Dog Onyx

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Mongrel, neutered male, 8 months

#### Medical history

- 10 days ago bite injury to the right ear (edge of the ear and in the auricle)
- Pretreatment: Chlorhexidine ointment

#### Therapy management

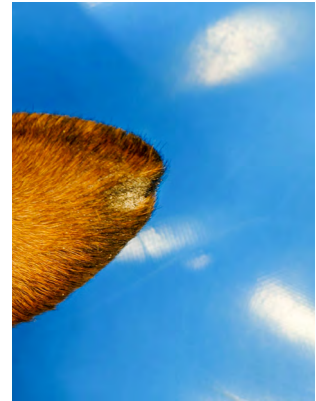
- PetCellpen® 1× weekly for 2 weeks, 6 min
- Glass electrode: Straight
- Pulse frequency: 100 Hz
- Amplitude: 8

#### Result

- Auricle injury after 1× PetCellpen® already healed, the ear margin wounds were significantly smaller after 1 week, were treated again and then healed completely



Before



After

## Case study wound healing

# Infected bite injury, abscess, tissue necrosis – Cat Sherry

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

ESH, neutered female, 3 yrs

### Medical history

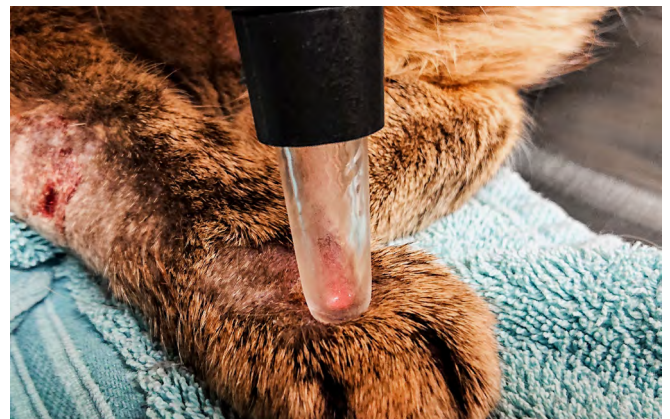
- Pretreated bite abscess, 10 days
- Surgical care: Drainage forearm to middle upper arm, rinses
- Previous antibiotics: Amoxicillin, Cefovecin, pradofloxacin, chloramphenicol
- Fever and spreading swelling, hard and painful
- Multidrug resistance, tissue necrosis started

### Therapy management

- PetCellpen® 2× first day and after 2 days, 10 min
- Glass electrode: Straight
- Pulse frequency: 40 and 80 Hz
- Amplitude: 4–8

### Result

- Repetition no longer necessary, heals



## Case study wound healing

### Decubitus ulcer on the elbow, abscess – Dog Cora

---

Dr. med. vet. Leslie Wohlgroth  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Labrador, neutered female, 11 yrs

#### Medical history

- Painful abscess on decubitus ulcer
- Granuloma was surgically removed from the same place 2 yrs ago
- Recurrent, treated with cefalexin
- Recurrence
- The owner does not want another operation and, if possible, no more antibiotics

#### Therapy management

- PetCellpen® 2x weekly for 1.5 weeks, 3-4 min
- Glass electrode: Straight and disc
- Pulse frequency: 100 Hz
- Amplitude: 6-9

#### Result

- Has regressed



## Case study wound healing

### Bite injury – Cat Nala

---

med. vet. Larissa von Scotti  
Tierarztpraxis Jobsky,  
Penzberg, Germany

Maine Coon, neutered female, 4 yrs

#### Medical history

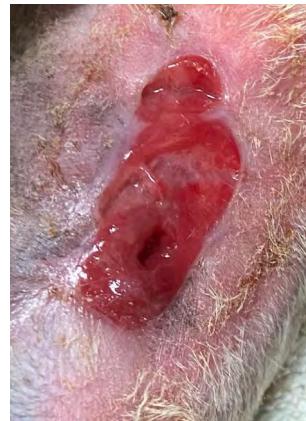
- Suture dehiscence 3 weeks ago medially on the elbow
- Infected wound
- Pretreatment: Amoxicillin-clavulanic acid, lincomycin
- Euthanasia discussed, PetCellpen® therapy as a last resort

#### Therapy management

- PetCellpen® 2x weekly for 2 weeks, a few minutes
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 6
- Bandage therapy with polyurethane wound dressings for 1 week, then wound left open

#### Result

- Healed without complications after 2 weeks



*Before*



*After*

## Case study wound healing

### Suture dehiscence paw – Dog Tomo

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

German shepherd, male, 2 yrs

#### Medical history

- Interdigital abscess operated 3 months ago
- Reoperation due to suture dehiscence
- New suture dehiscence
- Pretreatment: Amoxicillin-clavulanic acid, enrofloxacin
- Bakteriology: Staphylococcus pseudintermedius, penicillin- and tetracycline-resistant

#### Therapy management

- PetCellpen® 1–2× weekly for 15 weeks, 20–60 min
- Glass electrode: Curved, straight and disc
- Pulse frequency: 100 Hz
- Amplitude: 8–9
- Cefalexin for 7 days
- Polycresulen ointment, honey ointment

#### Result

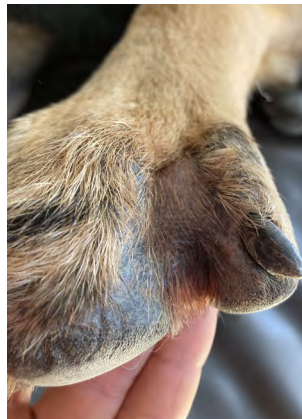
- After initial improvement, recurrence occurred
- The duration of therapy had to be significantly increased
- This prevented amputation of the toe and allowed the wound to heal



Before



Before



After

## Case study wound healing

### Abscess on the flank – Dog Doro

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Small lucerne hound, neutered female, 3 yrs

#### Medical history

- Cavernous abscess thoracolumbar right dorsal above the last costal arch, treated surgically and with amoxicillin/clavulanic acid 4 months ago, a small swelling remained
- Recurrence with renewed swelling. Ultrasound results: Diffuse loosening of the structure over the entire right flank, fluid accumulations, no capsule can be displayed. Cytology: Many highly degenerated neutrophils, many foreign body giant cells, many foamy macrophages with strongly blue colored granules, no evidence of neoplasia

#### Therapy management

- Surgical
- Intra-operative PetCellpen® therapy, 15 min
- Glass electrode: Curved
- Pulse frequency: 100 Hz
- Amplitude: 8
- Cefalexin, marbofloxacin

#### Result

- Recurrence of swelling despite antibiotics
- Follow-up treatment with the PetCellpen® 2x weekly for 2 weeks (glass electrode: Curved, pulse frequency: 100 Hz, amplitude: 9), 15 min
- Complete healing



1 year after surgery

## Case study wound healing

### Burn wound – Dog Coco

---

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European Specialist in Veterinary Dermatology  
Claudia S. Nett-Mettler

Flat Coated Retriever, neutered female, 11 yrs

#### Medical history

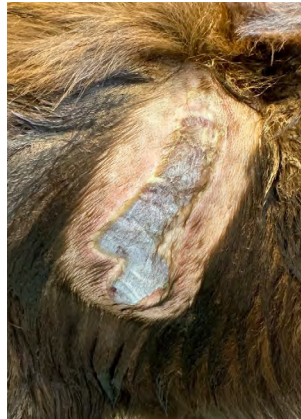
- Pressure cooker exploded in the kitchen and hot soup poured over the dog
- Pretreatment: Amoxicillin-clavulanic acid, meloxicam
- Dermatological findings: 2 burns on the right flank, 3×4 cm und 10×2 cm
- Diagnosis: Burns grade II

#### Therapy management

- PetCellpen® 2x weekly for 1.5 weeks, 1–5 min
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 5–8
- Finish amoxicillin-clavulanic acid (4 more days)
- Silver sulfadiazine ointment, black tea local

#### Result

- Healed without complications after 3 cold plasma treatments



*Before*



*Before last treatment*

## Case study wound healing

### Suture dehiscence – Dog Pepper

---

med. vet. Larissa von Scotti  
Tierarztpraxis Jobsky,  
Penzberg, Germany

Mongrel, neutered female, 10 yrs

#### Medical history

- Bite injury, suture dehiscence 5 days later
- Pretreatment: Amoxicillin-clavulanic acid

#### Therapy management

- PetCellpen® 2x weekly for 5 weeks, 5–15 min
- Glass electrode: Straight
- Pulse frequency: 90 Hz
- Amplitude: 9
- Finish amoxicillin-clavulanic acid (9 more days)

#### Result

- Healed without complications



*Before*



*After 2 PetCellpen® treatments*



*Before last treatment*

## Case study wound healing

### Suture dehiscence – Dog Nuka

---

Dr. med. vet. Vanessa Schifferle  
Tierarztpraxis zur Schmiede,  
Henggart, Switzerland

American Staffordshire Terrier, neutered male,  
6 yrs

#### Medical history

- Knee operation 2 years ago. Repeated suture dehiscence. Surgically revised several times
- Owner expressly requests no further surgery

#### Therapy management

- PetCellpen® 2x weekly for 4 weeks, 10–15 min
- Glass electrode: Straight and disc
- Pulse frequency: 100 Hz
- Amplitude: 8
- Chloramphenicol-nitrofurazone-prednisolone spray

#### Result

- Healed without complications



Before



After 2 weeks



After

## Case study wound healing

### Wound healing disorder tarsus – Cat Verity

---

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European Specialist in Veterinary Dermatology  
Claudia S. Nett-Mettler

Devon Rex, neutered female, 12 yrs

#### Medical history

- Referred for cold plasma therapy due to wound healing disorder on the left tarsus after abscess, existing for 2 months
- Systemic pretreatment: Various antibiotics
- Topical pretreatment: Ointments, dressings
- Dermatological findings: Approximately 2 cm wound with healthy granulation tissue, no evidence of infection, no active wound edges, cranial pressure necrosis from the bandage

#### Therapy management

- PetCellpen® 3× weekly for approximately 12 weeks, 2 min
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 6–9
- Bandage therapy

#### Result

- Healed without complications



Before



After 2 months of PetCellpen® therapy

## Case study wound healing

### Wound healing after polytrauma to the tarsal joint – Dog Peewee

Dr. med. vet. Claudia Hagemann-Krull  
Retired veterinarian

Whippet, male, 7 yrs

#### Medical history

- Severe polytrauma of the right tarsal joint while playing (fracture, ligament damage, dislocations)
- Partial arthrodesis, cast
- Conventional therapy with doxycycline and carprofen
- Necrosis and decubitus. Metallic implants, tendons and nerves were exposed
- No cure even after 3 months of conventional therapy

#### Therapy management

- PetCellpen® every day for 2 weeks, 5 min
- Glass electrode: Straight
- Pulse frequency: 60 Hz
- Amplitude: 4
- Cast and bandage were replaced by sterile dressings and a long stocking

#### Result

- After 2 weeks all open areas had healed



2 weeks after surgery



After starting the cold plasma therapy



After

## Case study wound healing

# Impaired wound healing of amputated stump – Dog Momo

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Mongrel, neutered male, 6 yrs

### Medical history

- Animal welfare dog from Spain after unconventional amputation
- Wound healing problems due to sequestra, multidrug resistant germs (MRSA) and chronic pressure ulcers due to prosthese
- All antibiotics discontinued due to multidrug resistance

### Therapy management

- Surgically removed sequestra and prosthesis fitted
- PetCellpen® 1–2× weekly for 4 weeks, 10 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 6–8
- Hypochlorous acid cleansers, policresulen, honey ointment pads and meloxicam

### Result

- Good healing process



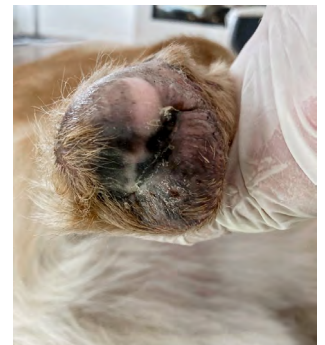
*Pressure ulcers before*



*Amputation stump before*



*Pressure ulcers after*



*Amputation stump after*

## Case study wound healing

### Multiple toe fractures with soft tissue injury following HBC – Dog Clarissa

Dr. med. vet. Vanessa Schifferle  
Tierarztpraxis zur Schmiede,  
Henggart, Switzerland

Standard schnauzer, neutered female, 10 yrs

#### Medical history

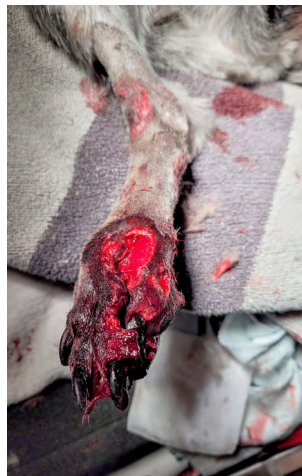
- Multiple toe fractures with soft tissue injury on both hind paws following HBC (Hit by a car)
- Goal: Avoid toe amputation, rapid wound healing

#### Therapy management

- Stabilization of the patient and immediate surgical treatment of the wounds
- Paw bandages on both hind limbs
- PetCellpen® therapy when dressing is changed, 3× weekly for 4 weeks, 5–10 min
- Glass electrode: Straight and disc
- Pulse frequency: 70 Hz
- Amplitude: 5

#### Result

- Soft tissue injury heals after 1 month
- After 7 weeks, the injuries are completely healed



Before



Before



After

## Case study wound healing

### Torn claw – Dog Saya

---

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 European Specialist in Veterinary Dermatology  
 Claudia S. Nett-Mettler

Great dane, neutered female, 5 yrs

#### Medical history

- Claw torn
- Complete claw removal at a private veterinarian
- Wound heals hesitantly
- No medication, only bandage therapy

#### Therapy management

- One-time PetCellpen® therapy
- Glass electrode: Straight
- Pulse frequency: 100 Hz
- Amplitude: 4-6
- Bandage therapy as before

#### Result

- Healed 3 days after PetCellpen® therapy



*Before*



*In healing after treatment with the PetCellpen®*

## Case study wound healing

### Erythema ab igne – Dog Zegna

---

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European Specialist in Veterinary Dermatology  
Claudia S. Nett-Mettler

Chow Chow, male, 4 yrs

#### Medical history

- Had an elbow arthroscopy and 1 week later severely reddened scrotum
- Systemic pretreatment: Robenacoxib, oclacitinib, amoxicillin-clavulanic acid
- Topical pretreatment: Hydrocortisone acetate ointment, hyaluronic acid-microsilver gel
- Dermatological findings: Scrotal skin demarcated to about 2/3, there erythema, crusts, ulcerations, active wound healing margins
- Diagnosis: Erythema ab igne due to 'heating mat burn' during arthroscopy

#### Therapy management

- Treated once with argon plasma and laser
- PetCellpen® 1x weekly for 3 weeks, 2–3 min
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 2–5
- Silver sulphadiazine ointment, black tea

#### Result

- Healed without complications



*Initial presentation before PetCellpen® treatment*



*Before last treatment*

Case studies

Dentistry

---



## Case study dentistry

### Stomatitis IV. degree – Dog Baron

Dr. med. vet. Anna Misztal-Kunecka  
Gabinet weterynaryjny DentalVet  
Szczecin, Poland

Mixed breed, neutered male, 8yrs

#### Medical history

- Stomatitis IV. degree
- Periapical lesions
- Vertical bone recession
- Pathological pockets
- Furcations I-III. degree

#### Therapy management

- Multiple tooth extractions
- PetCellpen® only on the right side of the mouth at the day of surgery and one week after surgery, 2–4 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 8
- Amoxicillin-clavulanic acid for 7 days
- Meloxicam for 3 days

#### Result

- Following the application of PetCellpen®, the gums on the right side are much better healed than on the left side
- No tissue soreness or swelling on the right side



*Right side: One week after the treatment with PetCellpen®.  
The gums have healed better than on the untreated left side*



*Left side: Without cold plasma treatment*

## Case study dentistry

# Impaired healing of the alveolus – Cat Lucky

---

Dr. med. vet. Anna Misztal-Kunecka  
Gabinet weterynaryjny DentalVet  
Szczecin, Poland

ESH, neutered male, 6yrs

### Medical history

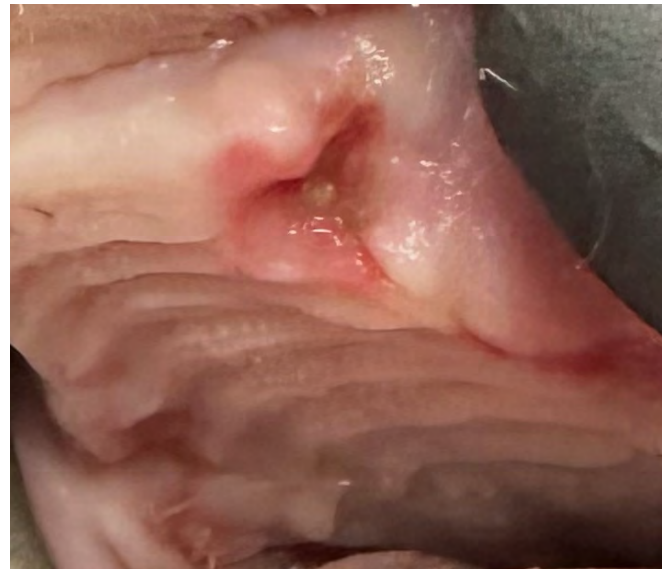
- Suture dehiscence post-extraction of tooth 204
- Delayed wound healing with swelling of the alveolar area
- No signs of dry alveolus: The alveolus is covered with some granulation tissue

### Therapy management

- Cleaning-up of the alveolus
- PetCellpen® at the day of surgery and 1x weekly for 2 weeks, 2–4 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 8
- Meloxicam for 3 days

### Result

- Healed without complications within 2 weeks



*First day of treatment*



*14 days after treatment*

## Case study dentistry

### Juvenile feline stomatitis – Cat Luna

---

Dr. med. vet. Anna Misztal-Kunecka  
Gabinet weterynaryjny DentalVet  
Szczecin, Poland

ESH, neutered female, 9 months

#### Medical history

- Redness at the gingival line

#### Therapy management

- Oral X-ray: Tooth 307 and 206 qualified for extraction. An attempt was made to save teeth 308, 309 (mandibular premolars and molars), 207 to 209 (maxillary premolars and molars) and the maxillary and mandibular canines
- PetCellpen® at the day of the surgery and once after 2 weeks, 2 - 4 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 8

#### Result

- The inflammations have cleared up and so after the treatment with the PetCellpen® no further teeth had to be extracted



## Case study dentistry

# Juvenile chronic hypertrophic gingivitis – Cat Pinky

Dr. med. vet. Anna Misztal-Kunecka  
Gabinet weterynaryjny DentalVet  
Szczecin, Poland

Norwegian forest cat, neutered male, 3yrs

### Medical history

- Severe mucosal hypertrophy
- IV. degree stomatitis with multiple resorptions

### Therapy management

- Multiple tooth extraction
- Laser mucosa correction
- PetCellpen® one week before surgery, on the day of the surgery and 1x one week after surgery, 2–4 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 8
- Chlorhexidine-gel
- Meloxicam for 5 days

### Result

- Healed without complications

### Comment

- Cold plasma was used to obtain as much healthy mucosa as possible so that the extraction wounds could be sutured. After the operation, it was used transcutaneously to improve tissue healing



*Left side before surgery and before cold plasma treatment*



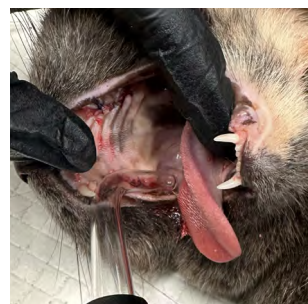
*Right side before surgery and before cold plasma treatment*



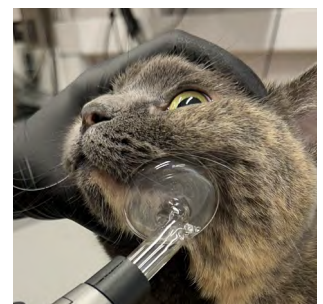
*Left side after surgery*



*Right side after surgery*



*Intraoperative cold plasma treatment*



*Transcutaneous cold plasma treatment*

## Case study dentistry

### Stomatitis caudalis – Cat Radek

---

Dr. med. vet. Anna Misztal-Kunecka  
Gabinet weterynaryjny DentalVet  
Szczecin, Poland

ESH, neutered male, 6yrs

#### Medical history

- Stomatitis IV. degree with multiple resorptions

#### Therapy management

- Extraction of all teeth
- Laser correction of mucous membrane
- PetCellpen® on the day of surgery and then 1x weekly for 4 weeks, 2–4 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 8
- Chlorhexidine-gel
- Meloxicam

#### Result

- Healed without complications



*Day of surgery*



*2 weeks after surgery*



*4 weeks after surgery*

## Case study dentistry

### Orthodontic treatment – Dog Bolek

---

Dr. med. vet. Anna Misztal-Kunecka  
Gabinet weterynaryjny DentalVet  
Szczecin, Poland

Gos d'atura Catalan, neutered male, 11 months

#### Medical history

- Traumatic occlusion

#### Therapy management

- Orthodontic treatment
- PetCellpen® 1x weekly for 3 weeks, 2-4 min
- Glass electrode: Curved and disc
- Pulse frequency: 100 Hz
- Amplitude: 8

#### Result

- After treatment with PetCellpen®: No signs of inflammation in the gingival line and good orthodontic remodelling

#### Comment

- The antibacterial effect of cold plasma and improved blood supply to the tissue was used to eliminate inflammation associated with orthodontic treatment



## Case study dentistry

### Wound healing after gingivectomy – Dog Amy

---

med. vet. Anne Dowidat  
Kleintierpraxis und Zentrum für Zahnheilkunde  
und Kieferorthopädie, Wülfrath, Germany

Labrador mix, neutered female, 8 yrs

#### Medical history

- Untreated plaque, tartar, gingivitis and marginal periodontitis, generalised gingival hyperplasia of the molar

#### Therapy management

- Dental scaling and electrosurgical removal of protruding gum growths
- Meloxicam once
- PetCellpen® once, 4 min
- Glass electrode: Straight
- Pulse frequency: 100 Hz
- Amplitude: 8

#### Result

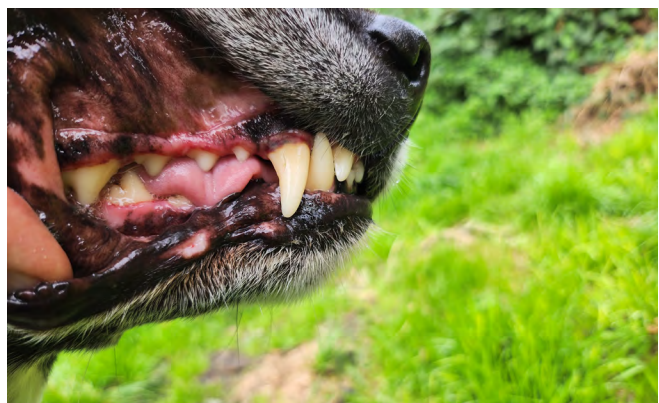
- Healed without complications and without antibiotics



*During surgery*



*1 day after surgery*



*2 days after surgery*

## Case studies

### Physiotherapy – pain therapy

---



## Case study physiotherapy – pain therapy

### Postoperative scars, causes lameness – Dog Aschei

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Pitbull, neutered female, 8 yrs

#### Medical history

- 1 year ago tumor excision right shoulder
- Partial suture dehiscence with secondary healing
- Keloid formation on 30 cm long scar
- Adhesions of the cutaneous keloid with fascia/muscles
- Chronic intermittent lameness as a result
- Patient avoids normal movements
- Patient no longer plays with other dogs

#### Therapy management

- PetCellpen® 2× weekly for 2 weeks and 1× weekly for 3 weeks, 15 min
- Glass electrode: Disc and curved
- Pulse frequency: 40 Hz
- Amplitude: 6–9

#### Result

- After 2–3 weeks reduction of lameness
- After 3 weeks keloid softer, excess keratin is rejected, more vital color
- After 5 weeks, no more lameness, normal mobility, plays normally again



## Case study physiotherapy – pain therapy

# Neuropathic pain at the thoracolumbar junction – Cat Chili

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

ESH, neutered male, 8 yrs

### Medical history

- Post traumatic, unclear genesis
- Bunion injury treated surgically
- Extreme pain at thoracolumbar junction
- Chili “freaks out”, bites when touched
- Hyperesthesia of the skin
- Radiology negative
- Therapy resistant despite NSAIA, dexamethasone, metamizole and butorphanol

### Therapy management

- PetCellpen® daily for 7 days, 10 min
- Glass electrode: Curved
- Modulating program
- Therapy acceptance achieved after a few minutes
- Can be touched after the first treatment

### Result

- Stopped after 7 days of therapy
- Symptom free for 1 year



## Case study physiotherapy – pain therapy

### Spondylosis at the lumbar spine – Dog Holly

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Boxer, neutered female, 6 yrs

#### Medical history

- Spondylosis lumbar spine, severe
- Despite NSAIDs arched back

#### Therapy management

- PetCellpen® 1× weekly for 2 weeks, 15 min
- Glass electrode: Curved
- Pulse frequency: 20 Hz
- Amplitude: 8

#### Result

- Immediate visible reduction of pain
- After 1–2 weeks improvement of general symptoms



## Case study physiotherapy – pain therapy

### Degenerative myelopathy – Cat Amiris

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Maine Coon, neutered female, 9 yrs

#### Medical history

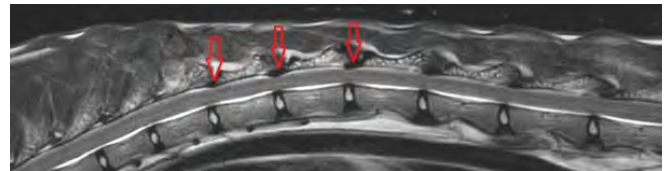
- Ataxia, severe dorsal pain, therapy resistant
- MRI findings: Extradural, dorsal, slight protrusion of the lig. flavum at the level of Th11-L1, multiple slightly degenerated nuclei pulposi
- Diagnosis: Degenerative myelopathy with poor prognosis

#### Therapy management

- PetCellpen® 1x weekly for 3 weeks, then again after 2 weeks, 15 min distributed over 3 pain points
- Glass electrode: Curved
- Modulating program
- Frunevetmab, gabapentin

#### Result

- Cat can be petted normally again after first treatment
- Significant and progressive improvement in gait pattern over 4 weeks



## Case study physiotherapy – pain therapy

### Limber tail – Dog Bessy

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Airedale terrier, neutered female, 8 yrs

#### Medical history

- Can't lift tail anymore, severe pain

#### Therapy management

- Meloxicam and metamizole
- PetCellpen® single use, 10 min
- Glass electrode: Comb
- Pulse frequency: 40 Hz
- Amplitude: 8

#### Result

- No follow-up treatment necessary, as tail lifting is possible again when going out



## Case studies

### Zoo animals

---



## Case study zoo animals

### Stagnant wound healing on the ear – African elephant

---

Dr. med. vet. Carolin Bunert  
Zoo veterinarian  
Zoo Duisburg gGmbH, Germany

African elephant, female, 32 yrs

#### Medical history

- Pretreated wound on the back of the right ear
- Wound healing stagnates after three months of treatment with daily cleansing and ammonium-bituminosulphate-wound ointment

#### Therapy management

- Continued daily cleaning of the wound
- PetCellpen® 3× weekly for 6 weeks, 5–9 min during training
- Glass electrode: Disc
- Pulse frequency: 100 Hz
- Amplitude: 9

#### Result

- Blood circulation in the tissue is significantly stimulated
- Wound healing continues
- Complete healing within 6 weeks



*Start with PetCellpen® therapy*



*Completely healed after 6 weeks*



*The PetCellpen® therapy took place during training*

## Case study zoo animals

# Fresh injury to the right upper arm – Southern tamandua

---

Dr. med. vet. Carolin Bunert  
Zoo veterinarian  
Zoo Duisburg gGmbH, Germany

Southern tamandua (small anteater), female,  
10 yrs

### Medical history

- Fresh puncture or bite injury to the right upper arm
- Wounds connected by a channel under the skin

### Therapy management

- Wounds rinsed with wound irrigation solution
- Meloxicam
- PetCellpen® once, 4 min
- Glass electrode: Curved
- Pulse frequency: 100 Hz
- Amplitude: 8

### Result

- Wounds closed the next day, no further therapy necessary



## Case study zoo animals

### Flight membrane inflammation – Kuhl's Pipistrelle

Dr. med. vet. Katja Schönbächler  
Stiftung Fledermausschutz,  
Zürich, Switzerland

Kuhl's Pipistrelle, adult male

#### Medical history

- Found in poor general condition and with an abrasion injury on the swollen left forearm, suspected cat victim
- Pretreatment: Chloramphenicol, Meloxicam, various ointments
- Tentative diagnosis: Wing wasting disease after contact with cats. Wing wasting disease is characterised by black to weeping deposits and necrosis of the flight membrane. It is probably caused by ubiquitous bacteria and fungi

#### Therapy management

- Meloxicam on the first day of treatment, then PetCellpen® as sole therapy
- PetCellpen® 2–3× weekly for 3 weeks, 30–60 s (entire flight membrane at the beginning, then only a few spots)
- Glass electrode: Straight
- Pulse frequency: 20–60 Hz
- Amplitude: 2

#### Result

- The upper layers of the flight membrane and the black deposits begin to peel off after the first treatment, a sign of regeneration
- The blood vessels in the arm and flight membrane are already more clearly visible after the first treatment
- Healing after 3 weeks of cold plasma therapy and then release into nature



*Start cold plasma therapy. The flight membrane is not very elastic and has black coatings*



*2 days after the first cold plasma therapy: Enlarged blood vessels, the black deposits begin to peel off*



*After the 5th cold plasma therapy: The black deposits and the upper layers of skin have detached from the entire flight membrane*



*Day of release with physiological flight membrane*

## Case study zoo animals

# Suture dehiscence – Chinchilla Eywa

---

Dr. med. vet. Michael Hiestand  
Kleintierpraxis am Obersee,  
Altendorf, Switzerland

Chinchilla, female

### Medical history

- Chinchilla with multiple bite wounds, several centimeters long
- 2x suture dehiscence in 11 days, severe wound secretion
- Previous treatment: Cefovecin and meloxicam

### Therapy management

- Surgical care
- PetCellpen® 2x weekly for 1 week, 6 min per site
- Glass electrode: Straight
- Pulse frequency: 100 Hz
- Amplitude: 8
- Chloramphenicol

### Result

- At the check-up after 3 days already much better and dried



## Case study zoo animals

### Torn claw – Agile wallaby

---

Dr. med. vet. Carolin Bunert  
Zoo veterinarian  
Zoo Duisburg gGmbH, Germany

Agile wallaby, female, 2 yrs

#### Medical history

- Traumatic injury to the right main toe
- Clawed horn and parts of the clawed bone are absent, swelling of soft tissue

#### Therapy management

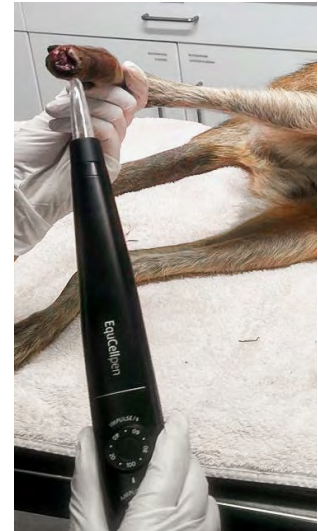
- Surgical care: Amputation of claw bone remnants
- Wound left open, wound dressing applied (wound dressing only necessary for 2 weeks)
- Medication in the first two weeks: Enrofloxacin and meloxicam
- PetCellpen® 2× weekly for 3 weeks, 4–5 min
- Glass electrode: Curved
- Pulse frequency: 100 Hz
- Amplitude: 8

#### Result

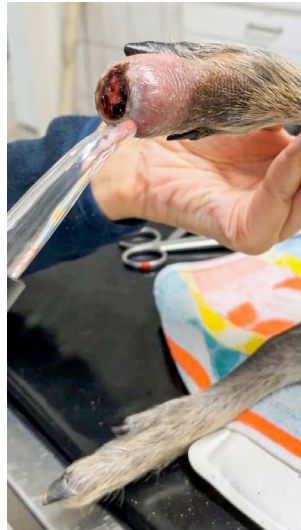
- Wound healed within 3 weeks



Before



Before



After 2 weeks

## Case study zoo animals

# Mysiasis – Rabbit

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med. vet. Larissa von Scotti  
Tierarztpraxis Jobsky,  
Penzberg, Germany

Rabbit, Miniature Lop, neutered male, 4 yrs

### Medical history

- Severe Mysiasis
- Surgical treatment

### Therapy management

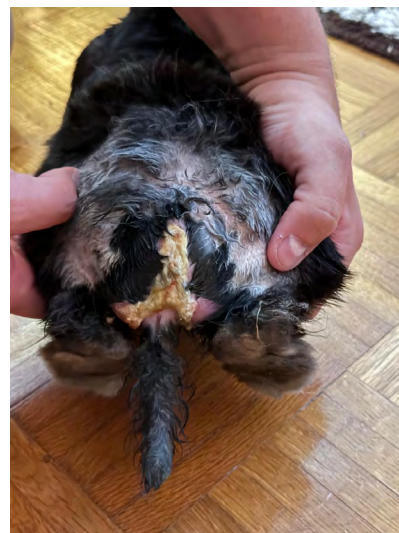
- PetCellpen® perioperatively and then 2x weekly while awake for 4 weeks, 15 min
- Glass electrode: Straight and disc
- Pulse frequency: 100 Hz
- Amplitude: 4-6
- Enrofloxacin for 7 days, meloxicam, metamizole

### Result

- Healed in 5 weeks



*Before*



*After 4 weeks*





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