equalis

APRESENTA:

2º FÓRUM VETWORK

SÃO PAULO · 2018

OTOLOGIA

CURSO DE OTOLOGIA DE CARNÍVOROS DOMÉSTICOS

CITOLOGIA, CULTURA E ANTIBIOGRAMA

- Marcio A. B. Moreira
- SANIMVET

Diagnostic microbiology in veterinary dermatology: present and future

Luca Guardabassi*†, Peter Damborg†, Ivonne Stamm‡, Peter A. Kopp‡, Els M. Broens§ and Pierre-Louis Toutain¶, the ESCMID Study Group for Veterinary Microbiology

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Background – The microbiology laboratory can be perceived as a service provider rather than an integral part of the healthcare team.

Objectives – The aim of this review is to discuss the current challenges of providing a state-of-the-art diagnostic veterinary microbiology service including the identification (ID) and antimicrobial susceptibility testing (AST) of key pathogens in veterinary dermatology.

Methods – The Study Group for Veterinary Microbiology (ESGVM) of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) identified scientific, technological, educational and regulatory issues impacting the predictive value of AST and the quality of the service offered by microbiology laboratories.

Results – The advent of mass spectrometry has significantly reduced the time required for ID of key pathogens such as *Staphylococcus pseudintermedius*. However, the turnaround time for validated AST methods has remained unchanged for many years. Beyond scientific and technological constraints, AST methods are not harmonized and clinical breakpoints for some antimicrobial drugs are either missing or inadequate. Small laboratories, including in-clinic laboratories, are usually not adequately equipped to run up-to-date clinical microbiologic diagnostic tests.

Conclusions and clinical importance – ESGVM recommends the use of laboratories employing mass spectrometry for ID and broth micro-dilution for AST, and offering assistance by expert microbiologists on pre- and post-analytical issues. Setting general standards for veterinary clinical microbiology, promoting antimicrobial stewardship, and the development of new, validated and rapid diagnostic methods, especially for AST, are among the

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Introduction

In veterinary medicine, the microbiology laboratory is perceived as a service provider rather than an integral part of the healthcare team, resulting in limited interaction between microbiologists and clinicians. This differs from human medicine, where microbiologists interact with infectious disease specialists to provide advice on antimicrobial therapy, infection control, antimicrobial stewardship practices, antimicrobial resistance trends and compliance with antimicrobial guidelines. The use of

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This article is based on a Supporting Review presentation at the

Na medicina veterinária, o laboratório de microbiologia é percebido como um prestador de serviços, em vez de uma parte integrante da equipe de saúde, resultando na interação limitada entre microbiologistas e clínicos. Isso difere da medicina humana, onde os microbiologistas interagem com especialistas em doenças infecciosas para fornecer aconselhamento sobre terapia de antimicrobianos, controle da infecção, manejo de antimicrobiano nas práticas de resistência antimicrobiana e cumprimento das diretrizes antimicrobianas.

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DESAFIOS

- Uso da cultura e ATB é menor na Medicina Veterinária que na Medicina Humana
- Custo alto com métodos automatizados
- Programas de padronização raramente são implantados na rotina veterinária (AVMA, Comissão Européia, OIE)
- Uso empírico de antimicrobianos e provas de susceptibilidade apenas quando se tem resposta insatisfatória ao protocolo inicial
- Existe uma crescente em HOVET(s) e Clínicas realizarem cultura e ATB no local -
  - Vantagens: (redução do tempo, custo)
  - Desvantagens: (profissional treinado, padronização de processos, controle de qualidade)
- Na Europa Grupo de Estudo de Microbiologia Veterinária (ESGVM)
- NO BRASIL.....

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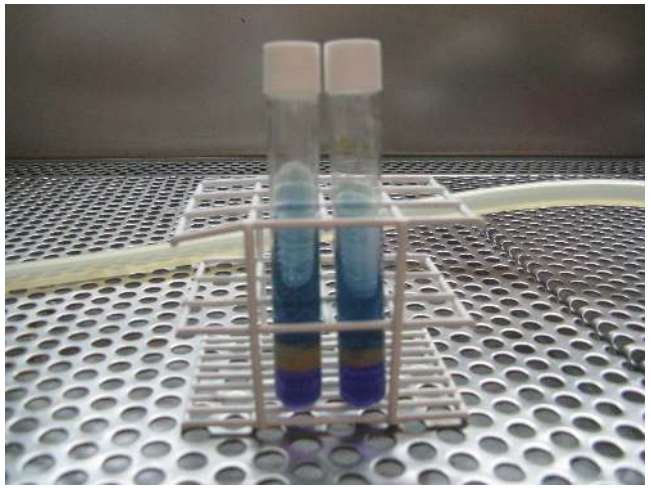
State-of-the-art methodologies

Microbe identification

Classic culture-based methods have been the mainstay of clinical microbiology for the past century. Automated systems are being implemented, but to date most of these technologies rely on pure culture of the micro-organism. Identification (ID) of the micro-organism is an important prerequisite before AST to distinguish between potentially pathogenic micro-organisms and possible contaminants from the commensal microbiota on nonsterile body sites. Microbial ID has traditionally been performed by testing biochemical properties of the micro-organism. A step forward was achieved with the development of standardized commercial test systems (e.g. API® or rapID™), which have gradually replaced the use of in-house tube

Identificação é importante antes do ATB
para distinguir potencial patógeno
e contaminante

Moreira, 2017 – HOVET-AM – Gram +



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Thermo Scientific™

RapID™ ONE System

API®

Be the First to Know.

The well-established method for manual microorganism identification to the species level, bioMérieux's API identification products are test kits for identification of Gram positive and Gram negative bacteria and yeast. The system offers a large and robust database now accessible through the Internet-based APIWEB™ service.

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Moreira, 2017 – HOVET-AM - VITEK

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- Investimento
- Alto custo do exame
- Identificação depende da base de dados (Humano x Veterinária)
- *Pseudomonas aeruginosa x Staphylococcus intermedius*

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X

AVANÇOS MÉDICOS

Novas metodologias de identificação de micro-organismos: MALDI-TOF

New methods of microbiological identification using MALDI-TOF

Jacyr Pasternak*

RESUMO

O diagnóstico rápido de patógenos é crucial para a terapêutica adequada. O método clássico de cultura é preciso e sensível, mas demorado; novos métodos permitem um diagnóstico muito mais rápido, que pode ser tão precoce como 15 minutos após obter um material enriquecido. Em uma hemocultura, por exemplo, é possível saber o agente etiológico nesse prazo, assim que a cultura se mostrar positiva. Esse novo método é o MALDI-TOF, uma aplicação da espectrometria de massa à microbiologia: o material é colocado

A identificação microbiológica de fungos e bactérias patogênicos tem sido realizada classicamente por métodos que envolvem cultura e, depois, testes fenotípicos explorando as diferenças metabólicas que existem entre as várias espécies.

Culturas são métodos extremamente poderosos de recuperação de patógenos: teoricamente, um único patógeno viável em meio adequado se multiplica em es-

https://www.bc-diagnostics.com/products/instruments/maldi-tof-ms/

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A sigla MALDITOF significa *Matrix Associated Laser Desorption-Ionization – Time of Flight*

https://www.bc-diagnostics.com/products/instruments/maldi-tof-ms/

Sequenciamento de bactérias – 24h

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Antimicrobial susceptibility testing

Broth micro-dilution and disk diffusion are the most widely used methods for AST. Broth micro-dilution is the gold standard method for AST and the only method for which an internationally accepted ISO standard exists (ISO 20776-1, 2006).[9] The principle of this method is

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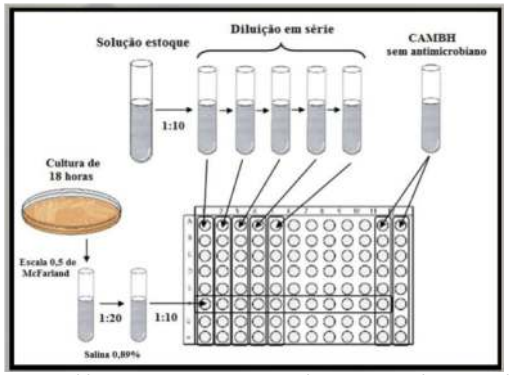
TRADICIONAL

Microdiluição em caldo



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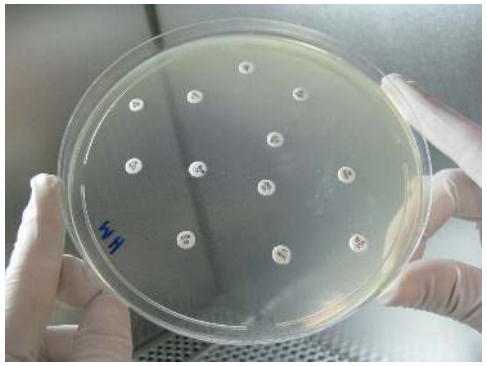
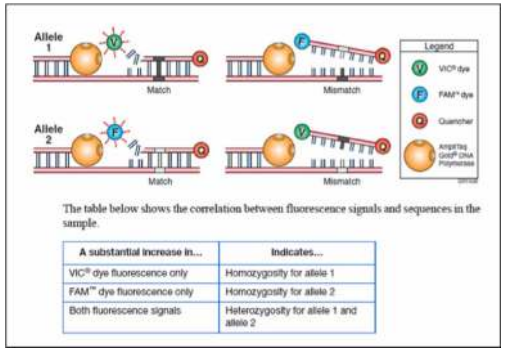
Difusão em disco



MARCIO, 2015

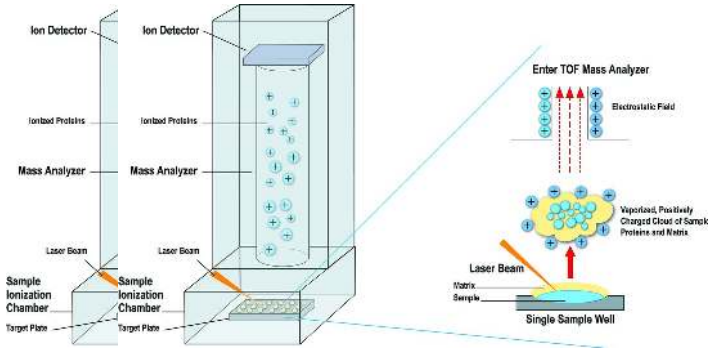
NOVAS TECNOLOGIAS

PCR em tempo real



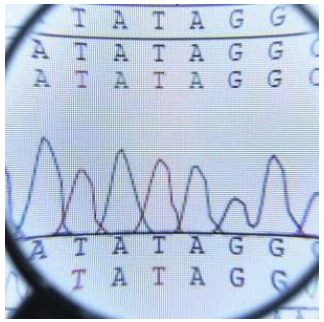
Resistência a meticilina

Malditof MS



Betalactamase de espectro estendido (ESBL)

WGS Sequenciamento



Todos os genes em um único exame

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Point-of-Care testing

Point-of-Care (PoC) tests are diagnostic tests that can be performed with the patient, therefore reducing turnaround time. The tests are based on different technologies, predominantly immunochromatography, agglutination assays and real-time PCR.[25] A rapid immunoassay for PoC detection of urinary tract infection in dogs (RapidBac™ Vet; http://www.rapidbacvet.com/) has a high sensitivity (97.4%) and specificity (98.8%) for identification of clinical bacteriuria.[26] A limited number of commercial PoC tests

Presentation	Advantages
Method: Mini culture tray **Analysis**: 7 bacteria: Staphylococcus, Streptococcus, Proteus, Pseudomonas, E. Coli, Enterobacteriaceae, Malassezia 15 antibiotic molecules: Amoxicillin, Amoxicillin + Clavulanic acid, Cefalexin, Ceftiofur, Doxycycline, Flumiquine, Enrofloxacin, Marbofloxacin, Spiraycin, Clindamycin, Neomycin, Gentamicin, Sulfonamide + Trimetroprim, Fusidic acid, Polymixin B **Sample**: Any skin, urinary, or auricular sample **Preparation**:3 minutes **Reading**: Antibiogram: 24 h, Identification: 48 h **Storage**: 16 months between 2°C and 8°C **Presentation**: 5 tests **Reliability**: Compared with the reference method, culture on Mueller-Hinton medium Index of concordance: 94% Detection threshold: 10^4 CFU/ml (1)	**Specifically designed for the veterinary practitioner**, Speed Biogram™ can be used for **simultaneous bacterial identification and antibiotic sensitivity testing** within 24 to 48 hours. Speed Biogram™ provides **an antibiogram directly from the sample**, thus simulating natural conditions. When results are emonstrated to the owner, Speed Biogram™ can be used to **enhance the diagnosis and improve owner's compliance** to the antibiotic treatment.

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Pathogen identification

Bacterial species relevant for common disease conditions in veterinary dermatology are listed in Table 1. Staphylococci are the most frequent bacterial pathogens associated with skin and soft tissue infections. Historically,

NOVOS CRITÉRIOS

ESGVM (Grupo Europeu de Estudo de Microbiologia Veterinária) – Liberar antibiograma de agentes coagulase negativo quando isolados de lesões primárias e/ou após isolamento após limpeza

Provas de sensibilidade devem ter como alvo o agente com potencial patogênico

Os agentes de mínima relevância em culturas polimicrobianas devem ser citados porém não existe a necessidade de realização de provas de sensibilidade

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COLETA DE MATERIAL

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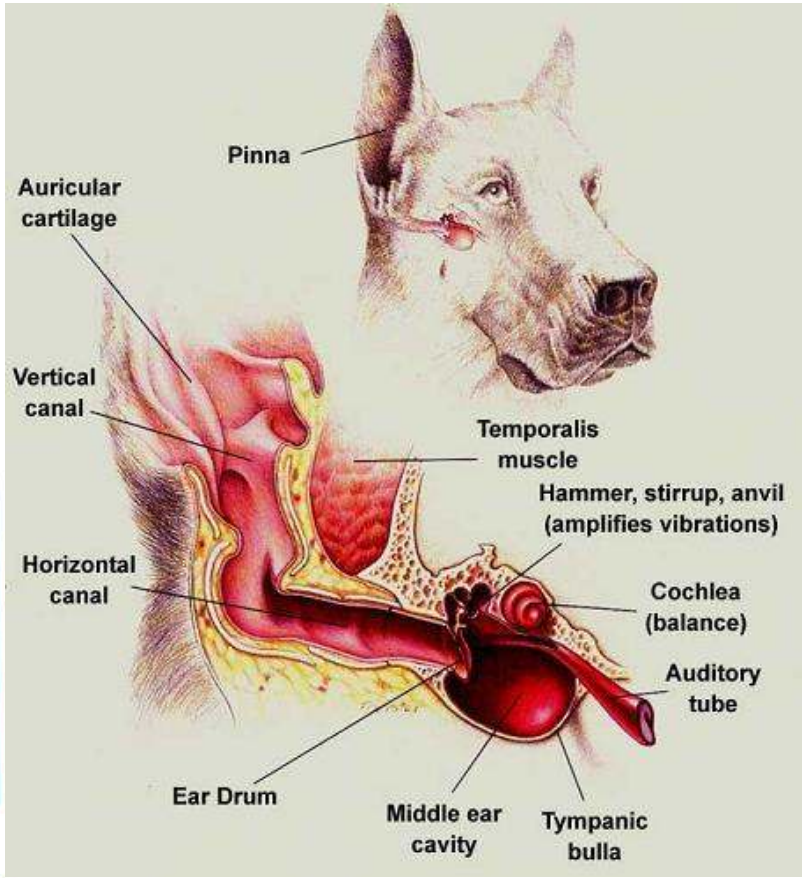

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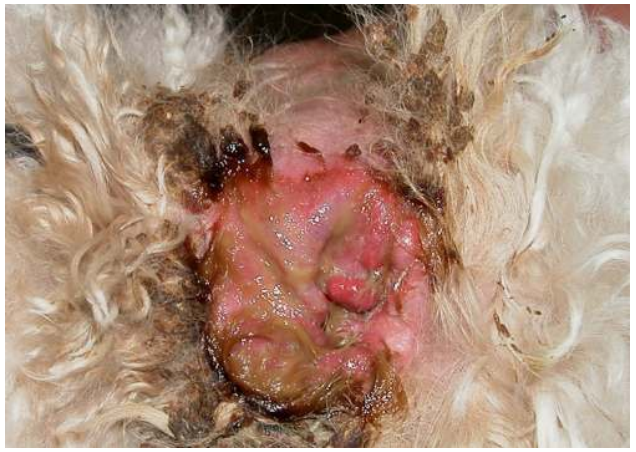

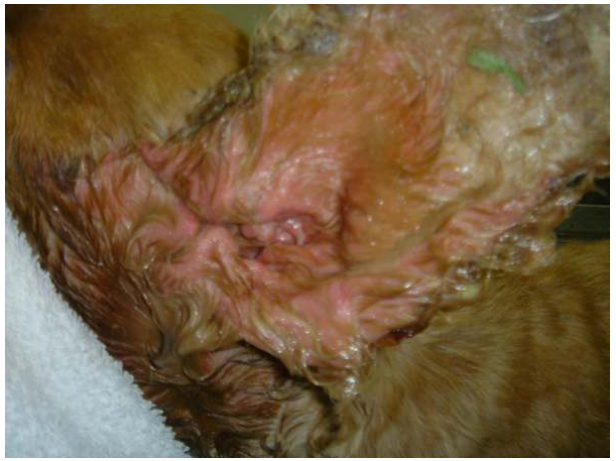

Ronaldo Lucas

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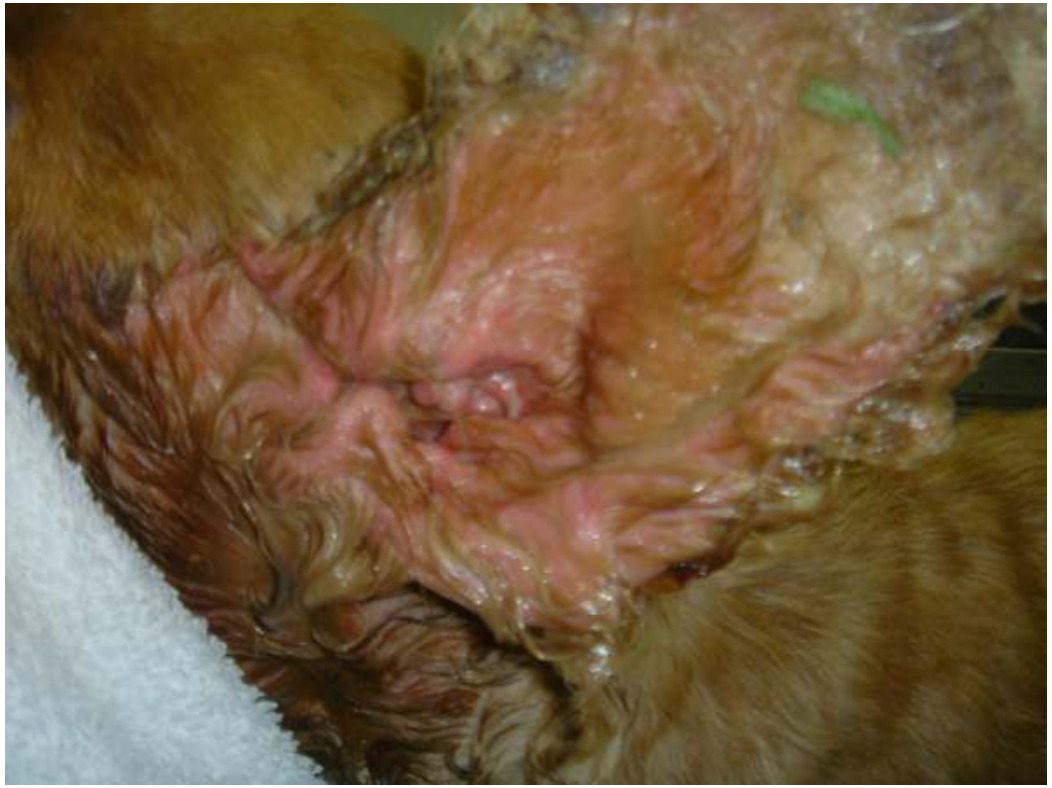


RONALDO LUCAS

REALIZAR LIMPEZA NO MOMENTO DA COLETA

7.5

Otitis controversies

C. Griffin (Chairperson) and J. Aniya (Secretary)

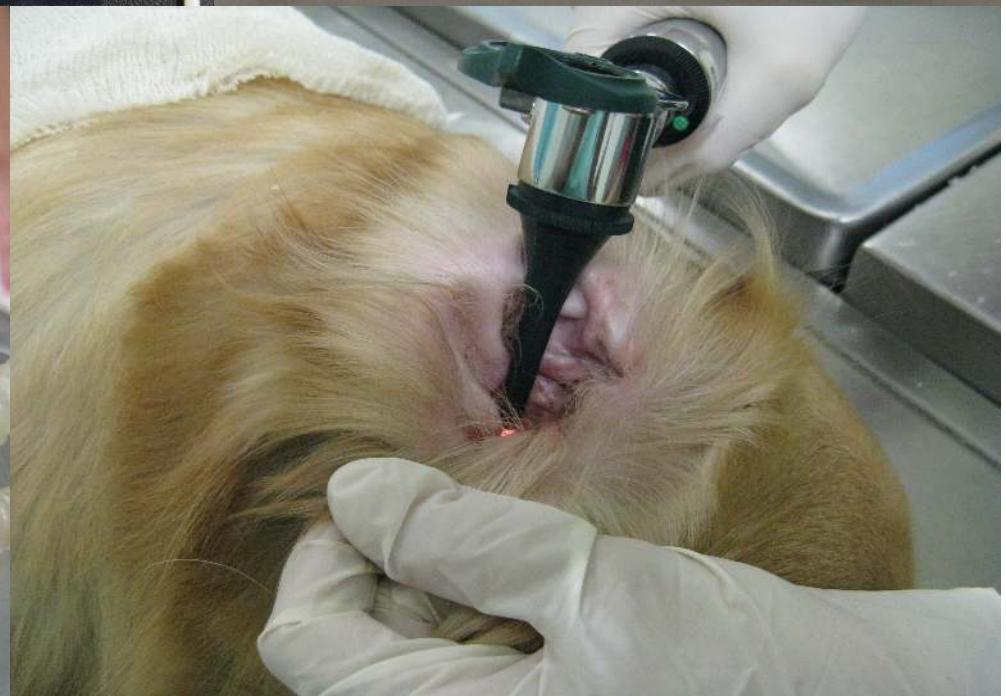
Animal Dermatology Clinic, San Diego, CA, USA

Craig Griffin (*USA*) welcomed participants and discussed the interactive nature of the workshop. The audience would have the opportunity to vote and answer questions through a live poll. Some questions would be asked to

grew *Staphylococcus pseudintermedius* in both samples and both had different strains. The high occurrence of different culture results and sensitivities raised the question of whether a culture was a cost-effective test.

Another study evaluated the treatment of *Pseudomonas* otitis based on empirical antibiotic selection versus culture and sensitivity.[2] Twenty cases of *Pseudomonas* otitis were cultured and empirical antibiotic treatment was started while awaiting culture results. Of those 20 cases cultured, seven out of 20 cultures grew pure *Pseu-*

Marcio-HOVET-AM, 2009



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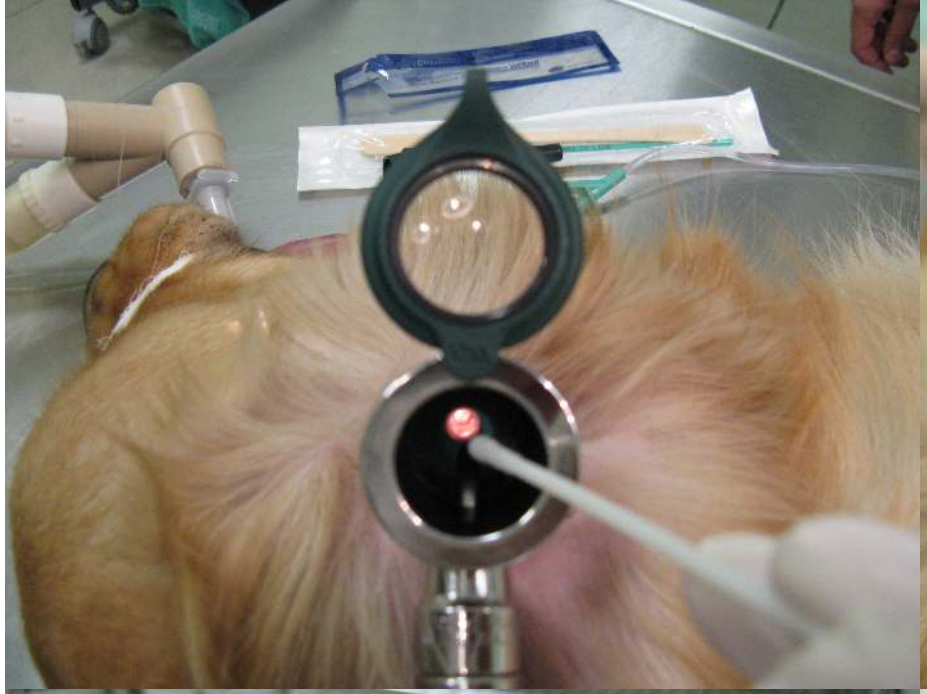

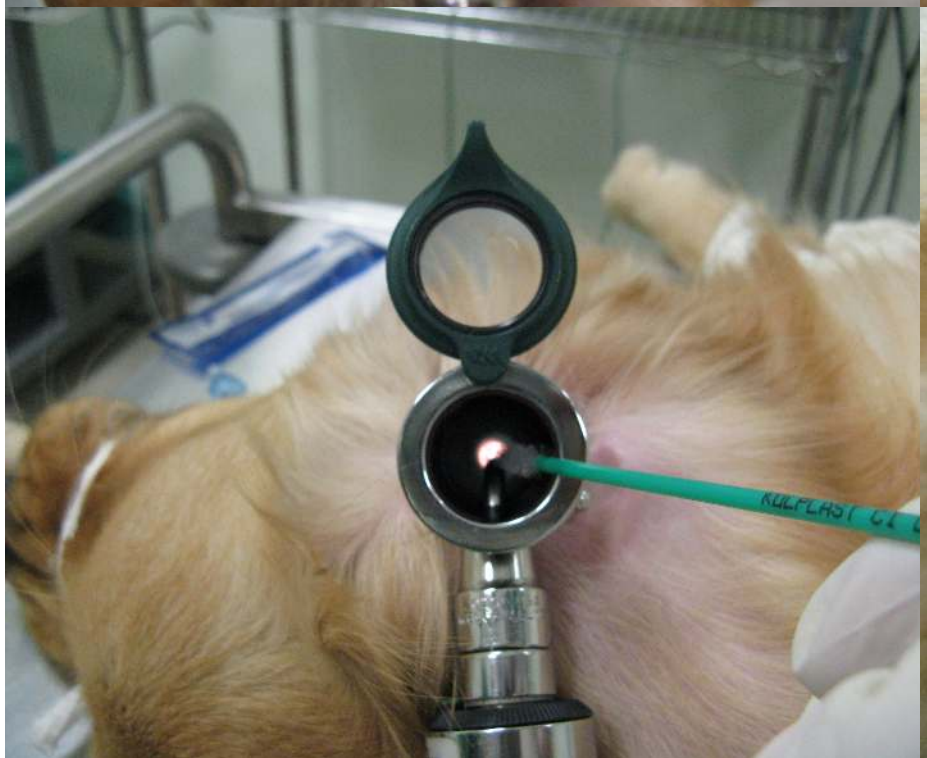

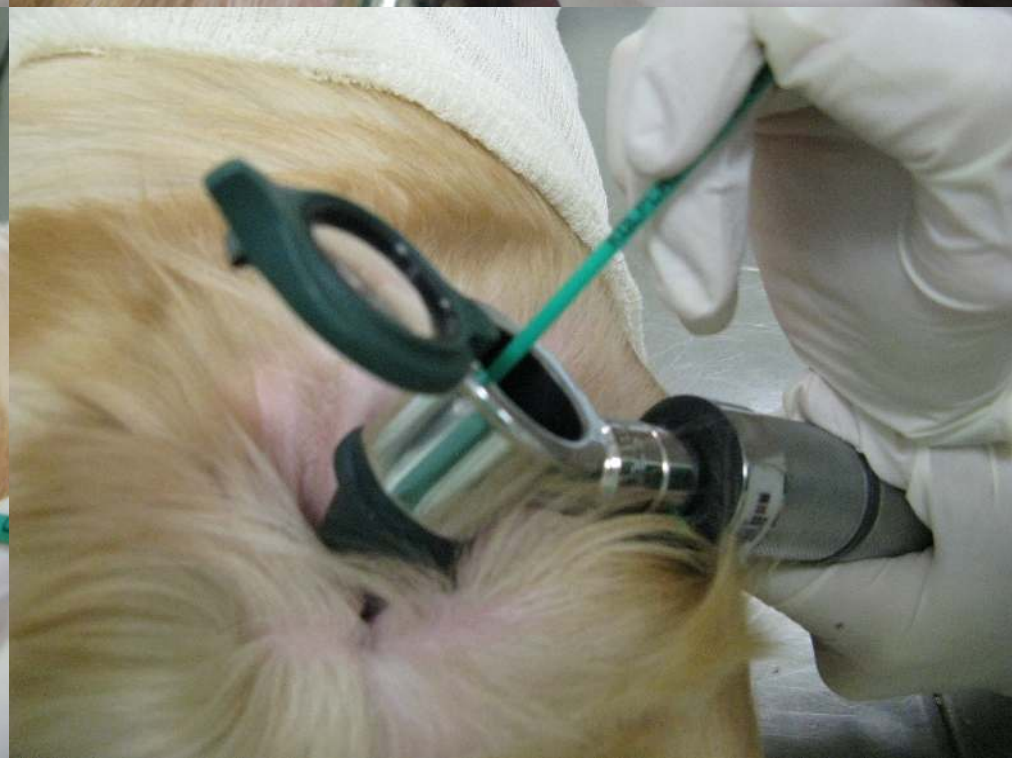

Marcio-HOVET-AM, 2009

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Marcio, Ronaldo-
Dermatoclínica, 2017

OTITE EXTERNA

Marcio, Igor, Ronaldo-
Dermatoclínica, 2017

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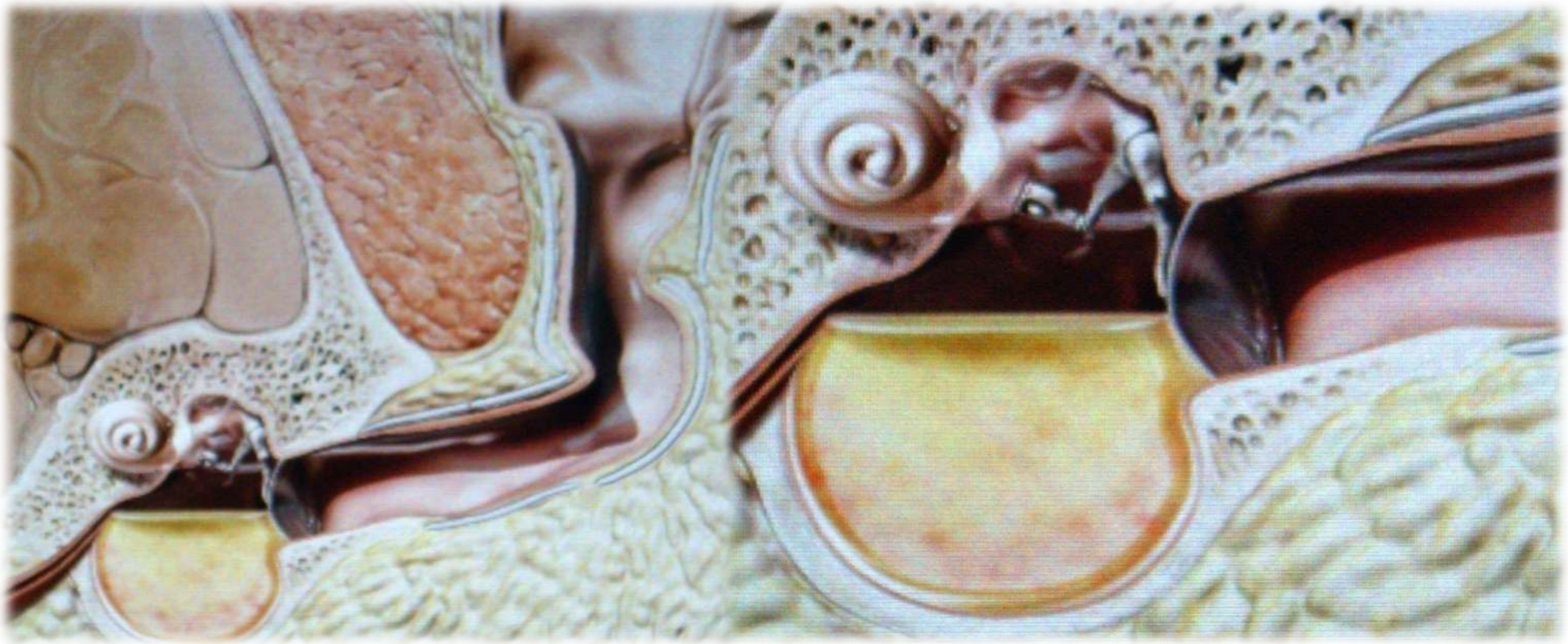

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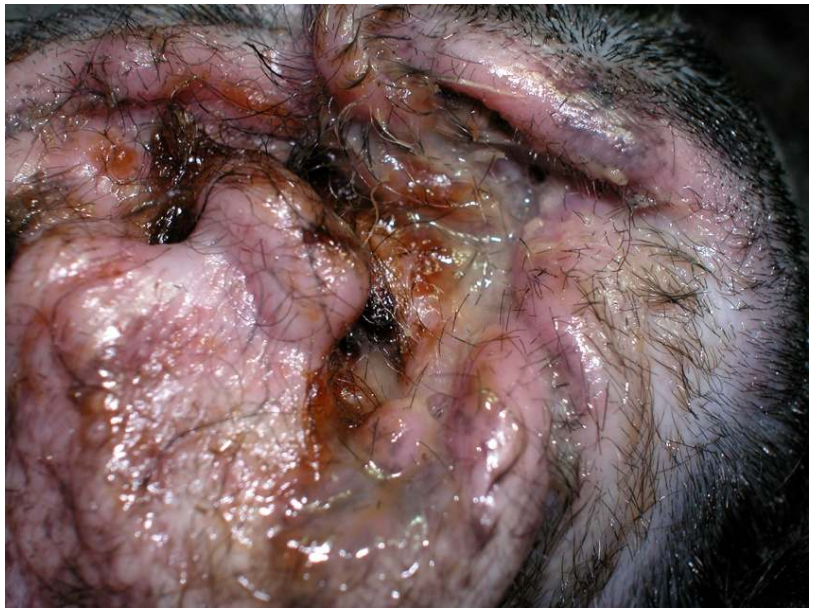
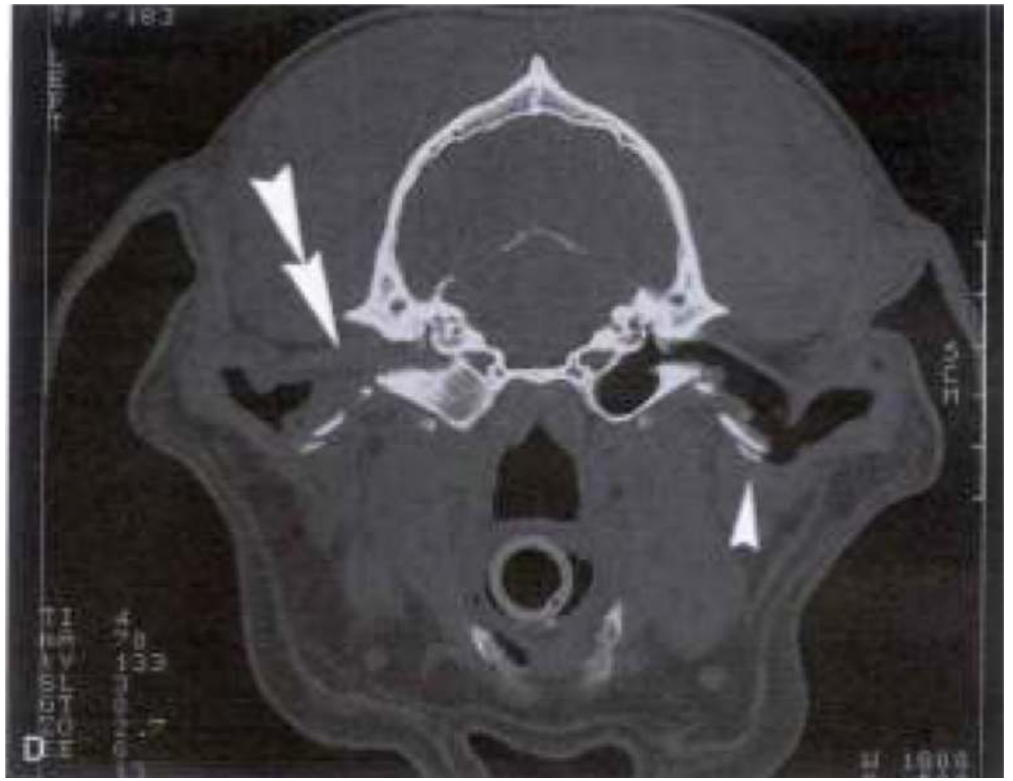
- *Exames de imagem (Rx, tomografia, ressonância)*

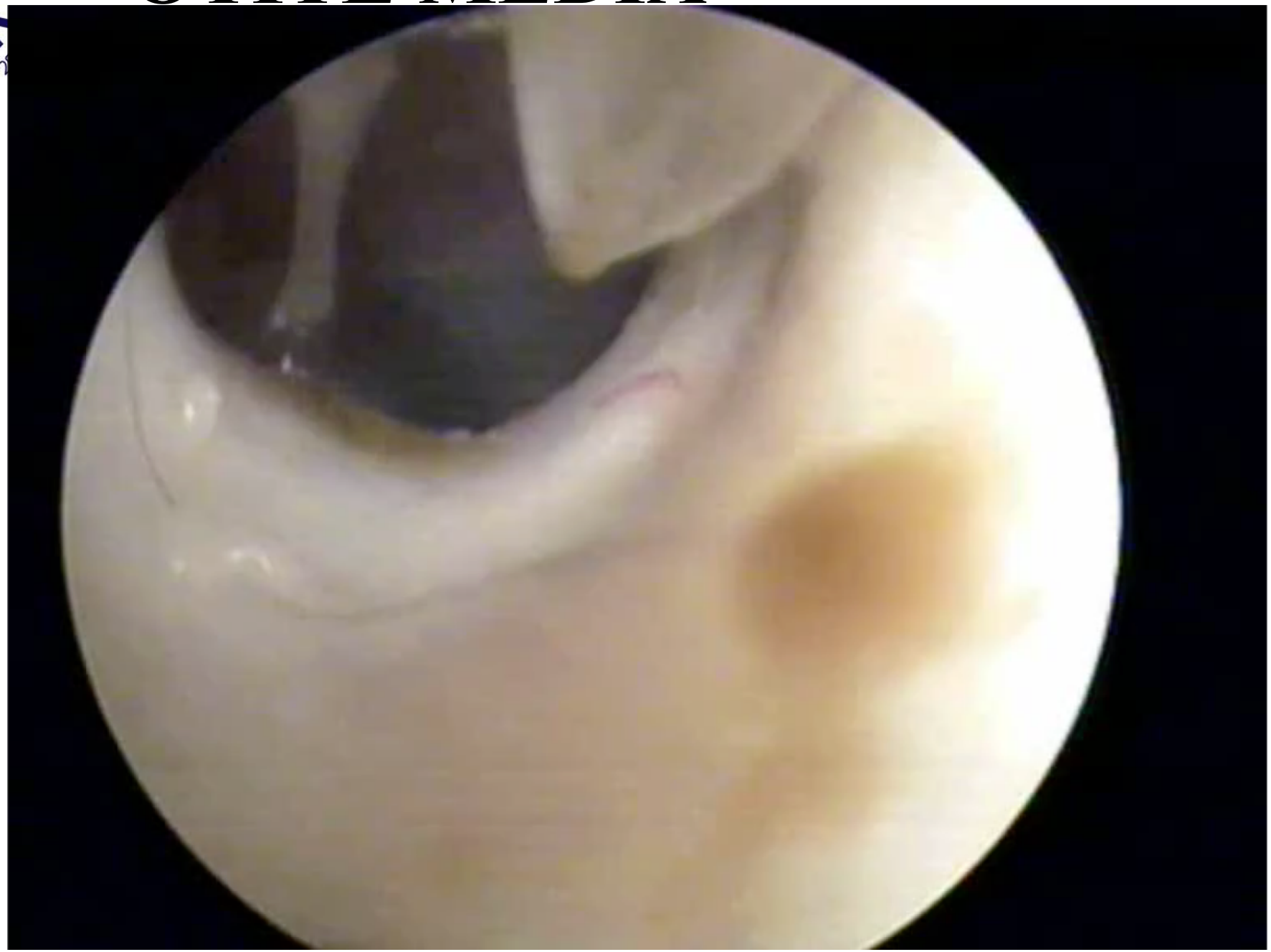


RONALDO LUCAS



FORREST, LJ; KORTZ,G. Advanced imaging techniques. In: SMALL ANIMAL EAR DISEASES NA ILLUSTRATED GUIDE, Philadelpnia: Editora W.B. Saunders Company, 2000

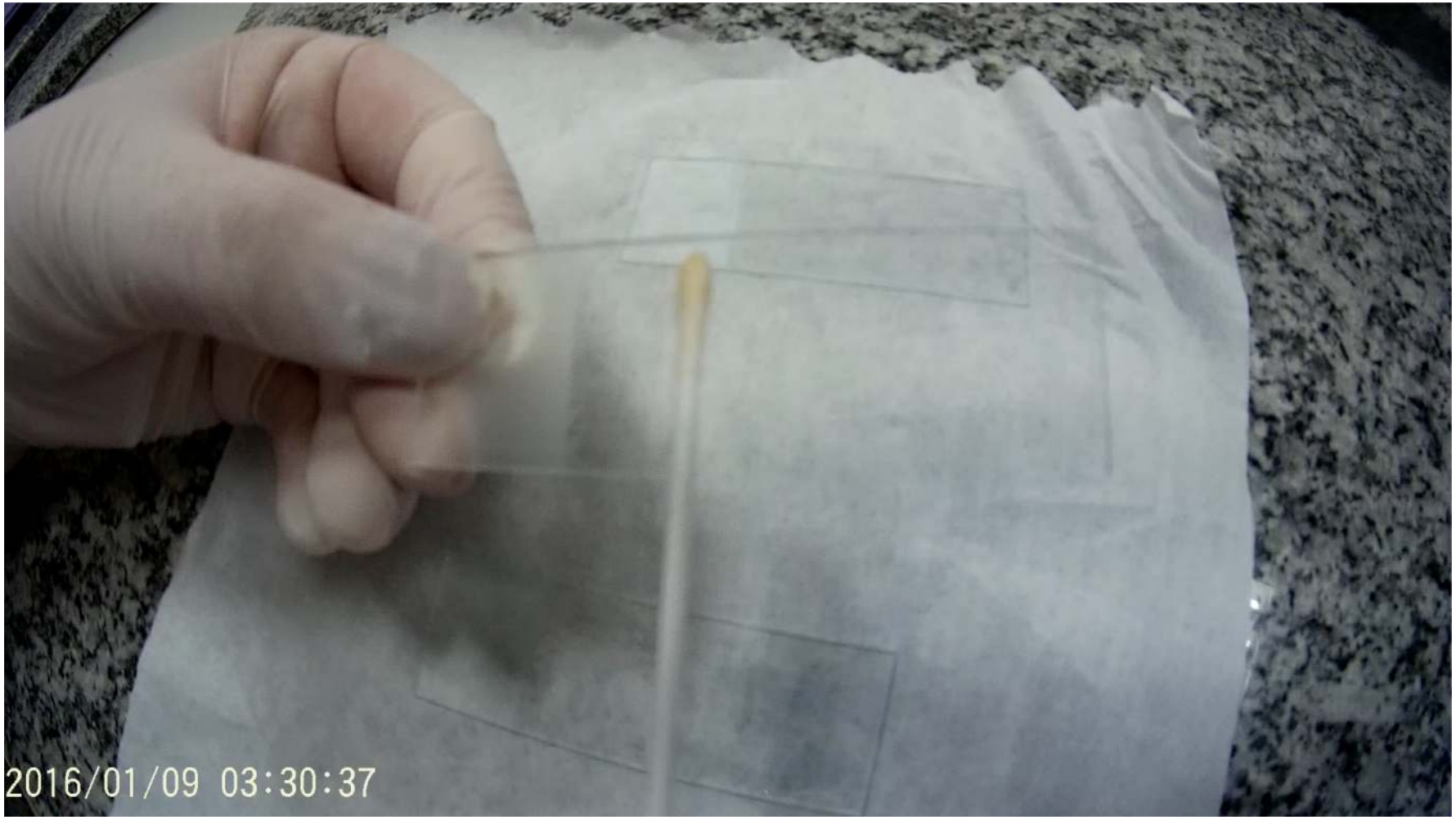
OTITE MÉDIA



RONALDO LUCAS

PREPARAÇÃO - CITOLOGIA

PREPARAÇÃO - CITOLOGIA



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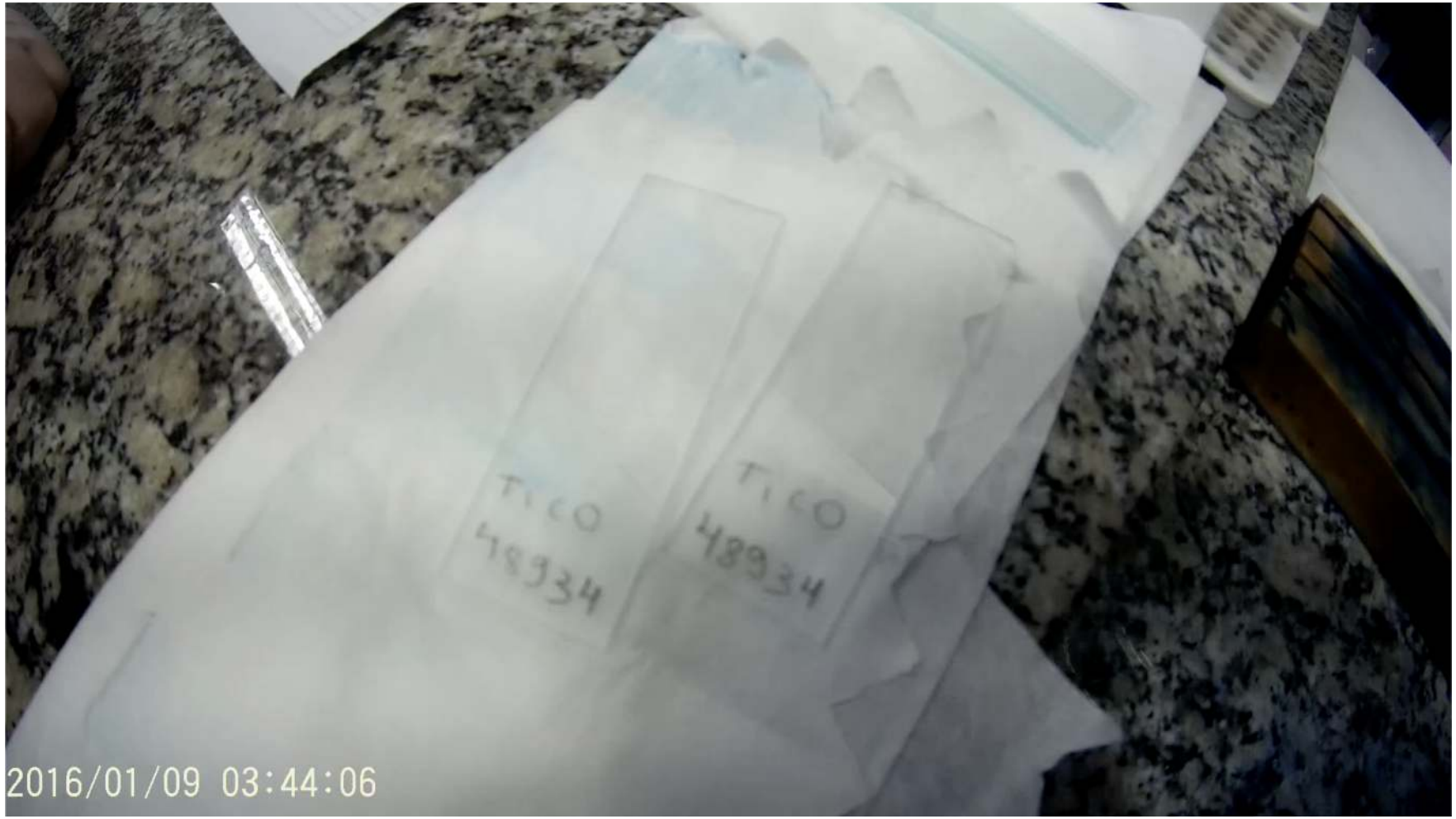

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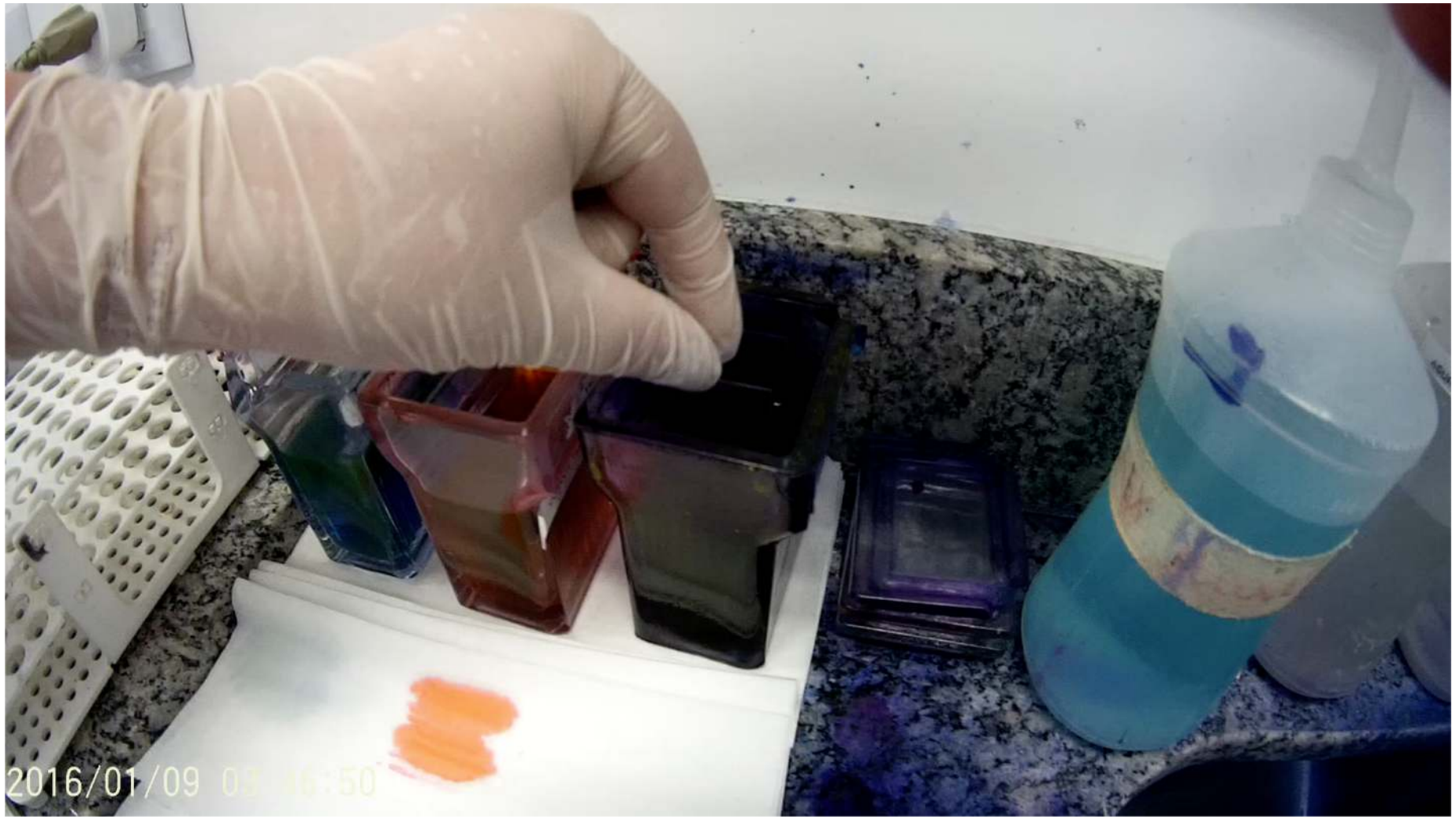

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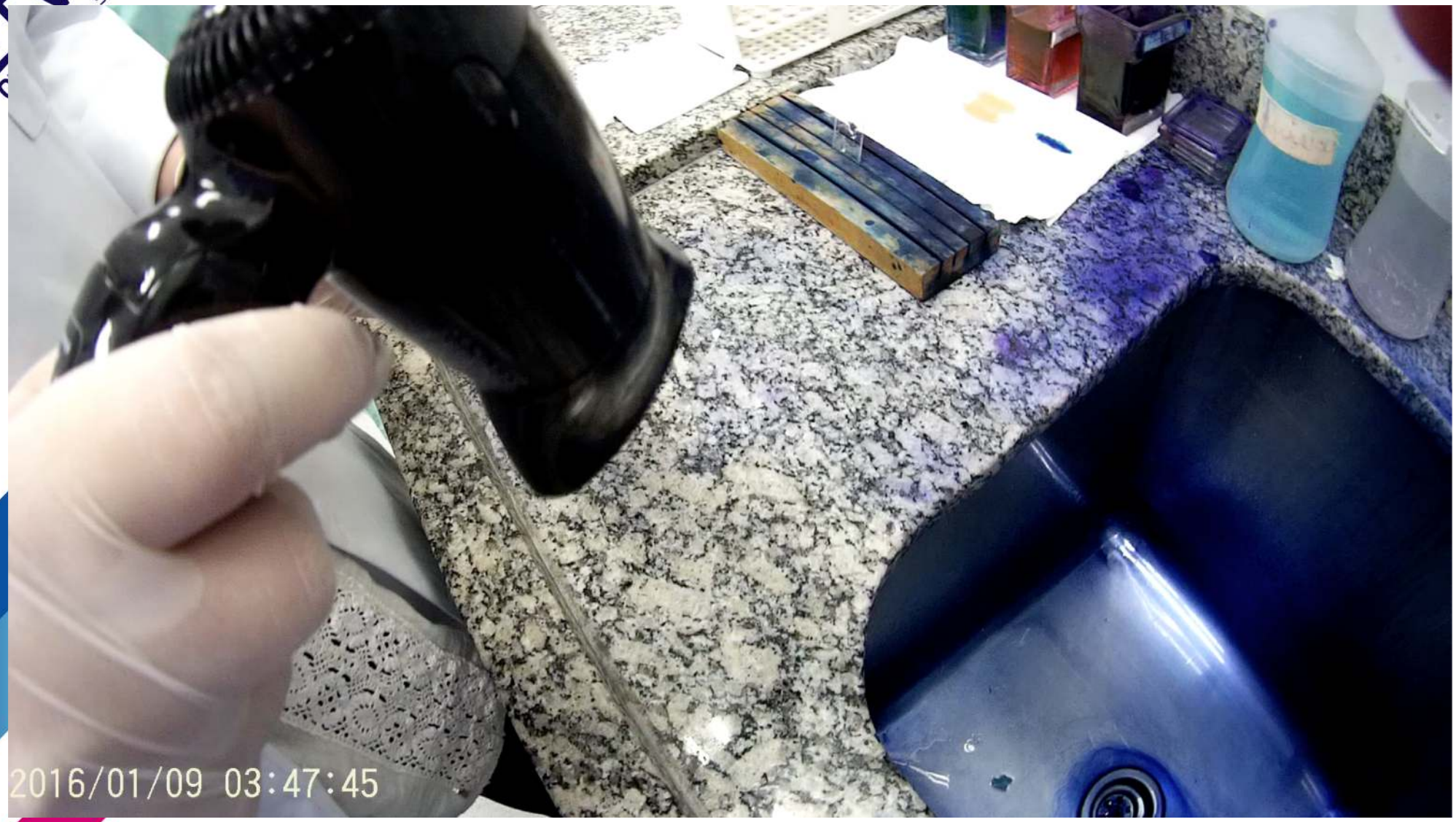


OBSERVAÇÃO - CITOLOGIA

marcio, 2005

DIAGNÓSTICO CITOLÓGICO EM OTITES

IDENTIFYING PATHOGENS

Pathogens in otitis externa: diagnostic techniques to identify secondary causes of ear disease

Stephen Shaw

This article describes the diagnostic techniques needed in the approach to otitis externa in the dog with particular emphasis on the correct identification of microbes causing secondary and perpetuating features of the disease. The common organisms are described, along with the numbers and features that determine whether treatment is necessary, with the emphasis on the correct use of the microscope and cytological interpretation.

EAR disease nearly always becomes complicated by bacterial and yeast secondary infection, to the point that we often simplify our approach to otitis by ignoring the predisposing, primary and perpetuating factors until we encounter treatment failure or disease recurrence. Secondary bacterial and *Malassezia* infections have marked effects on the ear, causing increased inflammation resulting in pruritus and pain and inciting hypersensitivity. Chronic infections play a key role in causing irrevocable changes that

organisms are described, particularly *Staphylococcus pseudintermedius*, and other cocci as well as rods. These bacteria serve similar roles to those on skin more generally, occupying environmental niches that would otherwise be suitable for pathological bacterial growth and acting on lipids to produce free fatty acids, which help create an antimicrobial environment. Ear cerumen contains immunoglobulins (IgA, IgG and IgM) and it is likely that these are accompanied by a wide variety of other substances deleterious

mechanisms by providing a 'conveyor belt' for wax and pathogens to the external meatus (Tabacca and others 2011).

In early ear inflammation there is an increase in ceruminous secretions that are more watery, which may help control bacterial proliferation. Later on in the disease process, hyperplasia of both sebaceous and ceruminous glands is less helpful and the movement of cerumen along the canal is reduced. Such hyperplasia is particularly seen in cocker spaniels (Angus and others 2002). Stenosis, accompanied by fibrosis and papular to nodular hyperplasia of the walls of the canal, allows further microbial growth that perpetuates disease (Huang and others 2009).

Failure of the normal balance between host and commensal organisms means that normal bacteria, such as *S pseudintermedius*, increase in numbers – in atopic dermatitis there is significantly higher carriage in the ears (Bannoehr and Guardabassi 2012). There

DIAGNÓSTICO CITOLÓGICO EM OTITES

- Orelha não deve ser limpa por pelo menos 48 horas antes do exames

- Pode ser fixada no reagente do corante, álcool metílico, calor

- Corantes rápidos

DIAGNÓSTICO CITOLÓGICO EM OTITES

Microscopia

Orelha normal: Predomínio de queratinócitos anucleares, poucos cocos e Malassezia

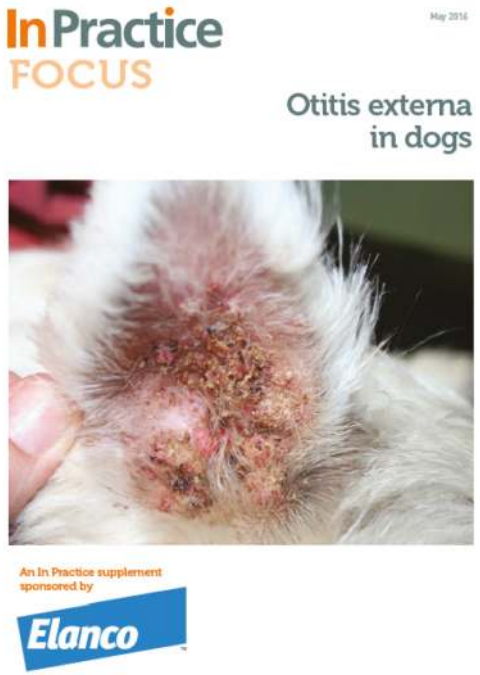
Super crescimento: Predomínio de queratinócitos anucleares e inúmeros agentes (fungo ou bactéria)

Pênfigo foliáceo : ↑ células epiteliais (nucleadas) – células acantolíticas

Inflamação (eritema, aumento de volume, ulceração): Neutrófilos - maioria degenerados; secreção purulenta; Gatos - muitos processos apresentam eosinófilos

Otite externa pode apresentar microorganismos no interior ou fora de elementos celulares. Quando no interior das células caracteriza infecção

DIAGNÓSTICO CITOLÓGICO EM OTITES



Aetiology of canine otitis externa: a retrospective study of 100 cases

Manolis N. Saridomichelakis*, Rania Farmaki†, Leonidas S. Leontides‡ and Alexander F. Koutinas†

*Clinic of Medicine, School of Veterinary Medicine, University of Thessaly, Karditsa, Greece
†Department of Clinical Studies, Faculty of Veterinary Medicine, Aristotles University of Thessaloniki, Thessaloniki, Greece
‡Laboratory of Epidemiology, Biostatistics and Animal Health Economics, School of Veterinary Medicine, University of Thessaly, Karditsa, Greece
Correspondence: Dr M Saridomichelakis, Clinic of Medicine, School of Veterinary Medicine, University of Thessaly, Trikalon Str. 224, GR-43100, Karditsa, Greece. E-mail: msarido@vet.uth.gr

What is known about the topic of this paper

- Canine otitis externa is very common in everyday clinical practice.
- Canine otitis externa has many causes that are classified into predisposing, primary, secondary and perpetuating.
- Treatment of canine otitis externa must target all

common primary causative factors; no primary factor could be incriminated in 32 cases and more than one was found in three dogs. *Malassezia* spp. (66/100 dogs), cocci (38/100) and rods (22/100) were the secondary causative factors, while ear canal stenosis (38/100) and tympanic membrane perforation-otitis media (25/100) were the most important perpetuating factors. Atopic dermatitis and adverse food reactions-associated OE was more common in females and dogs with a history of pruritic skin disease, while grass awn-induced OE occurred in cocker spaniels and acute cases. Tympanic membrane perforation was less frequent in atopic dermatitis and adverse food reactions-associated OE, but more common when otoscopic and ear canal cytological examination revealed the presence of grass awns and rods, respectively. Finally, cocci overgrowth was positively associated with ear canal stenosis.

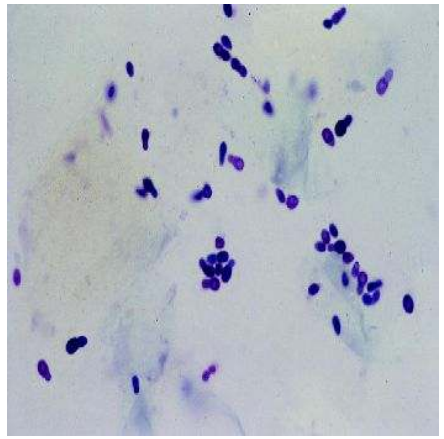
Accepted 24 July 2007

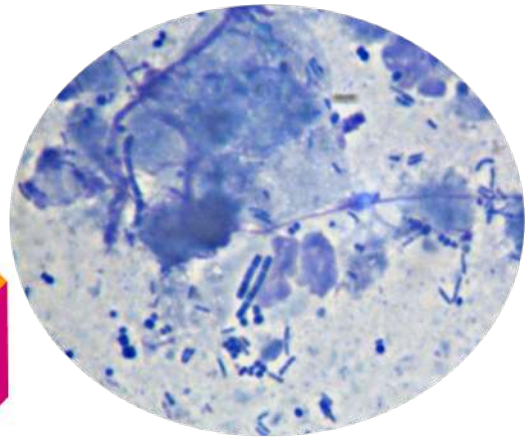
DIAGNÓSTICO CITOLÓGICO EM OTITES

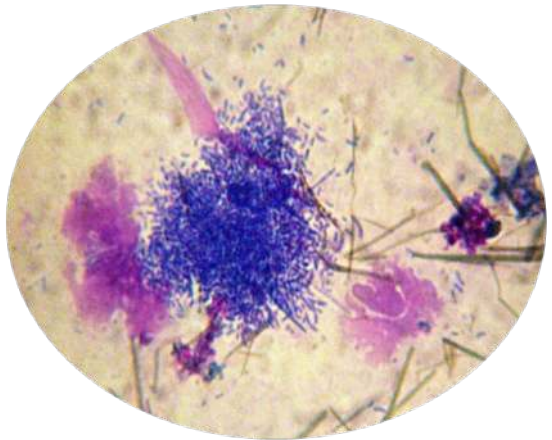
Microscopia

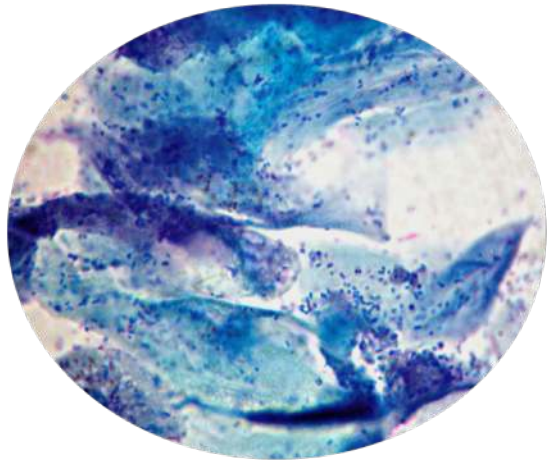
Quantificação dos micro-organismos:

≥ 10/campo de alto aumento (400x) - Malassezia
≥ 4/campo de alto aumento (400x) - Cocos
≥ 1/queratinócitos nucleado por campo (400x)



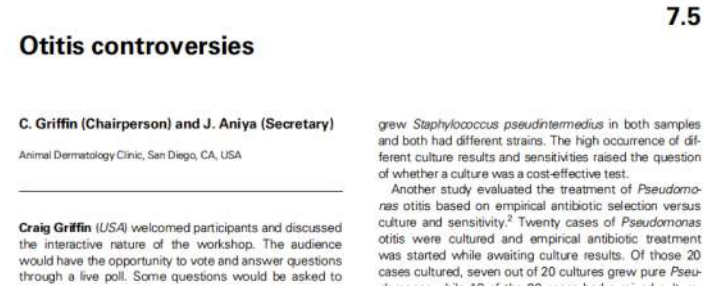






DIAGNÓSTICO CITOLÓGICO EM OTITES

BIOFILM



7.5

Otitis controversies

C. Griffin (Chairperson) and J. Aniya (Secretary)

Animal Dermatology Clinic, San Diego, CA, USA

Craig Griffin (*USA*) welcomed participants and discussed the interactive nature of the workshop. The audience would have the opportunity to vote and answer questions through a live poll. Some questions would be asked to

grew *Staphylococcus pseudintermedius* in both samples and both had different strains. The high occurrence of different culture results and sensitivities raised the question of whether a culture was a cost-effective test.

Another study evaluated the treatment of *Pseudomonas* otitis based on empirical antibiotic selection versus culture and sensitivity.[2] Twenty cases of *Pseudomonas* otitis were cultured and empirical antibiotic treatment was started while awaiting culture results. Of those 20 cases cultured, seven out of 20 cultures grew pure *Pseu-*

Presença de um material viscoso e de aspecto rendilhado na citologia com inúmeros agentes bacterianos entremeados

Realizar raspado da parede da orelha

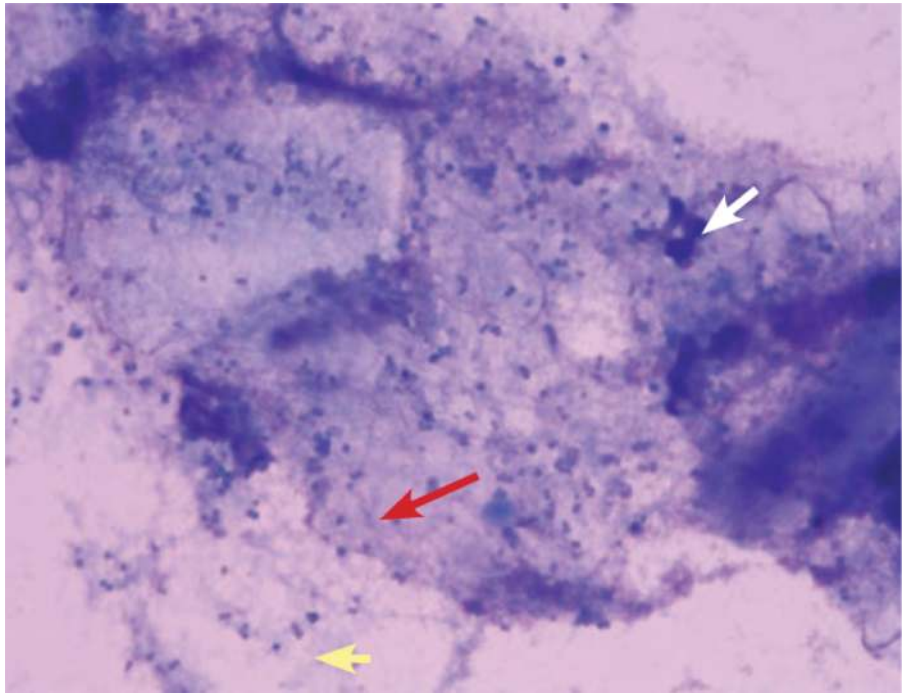
MANAGING THE DISEASE

Successful management of otitis externa

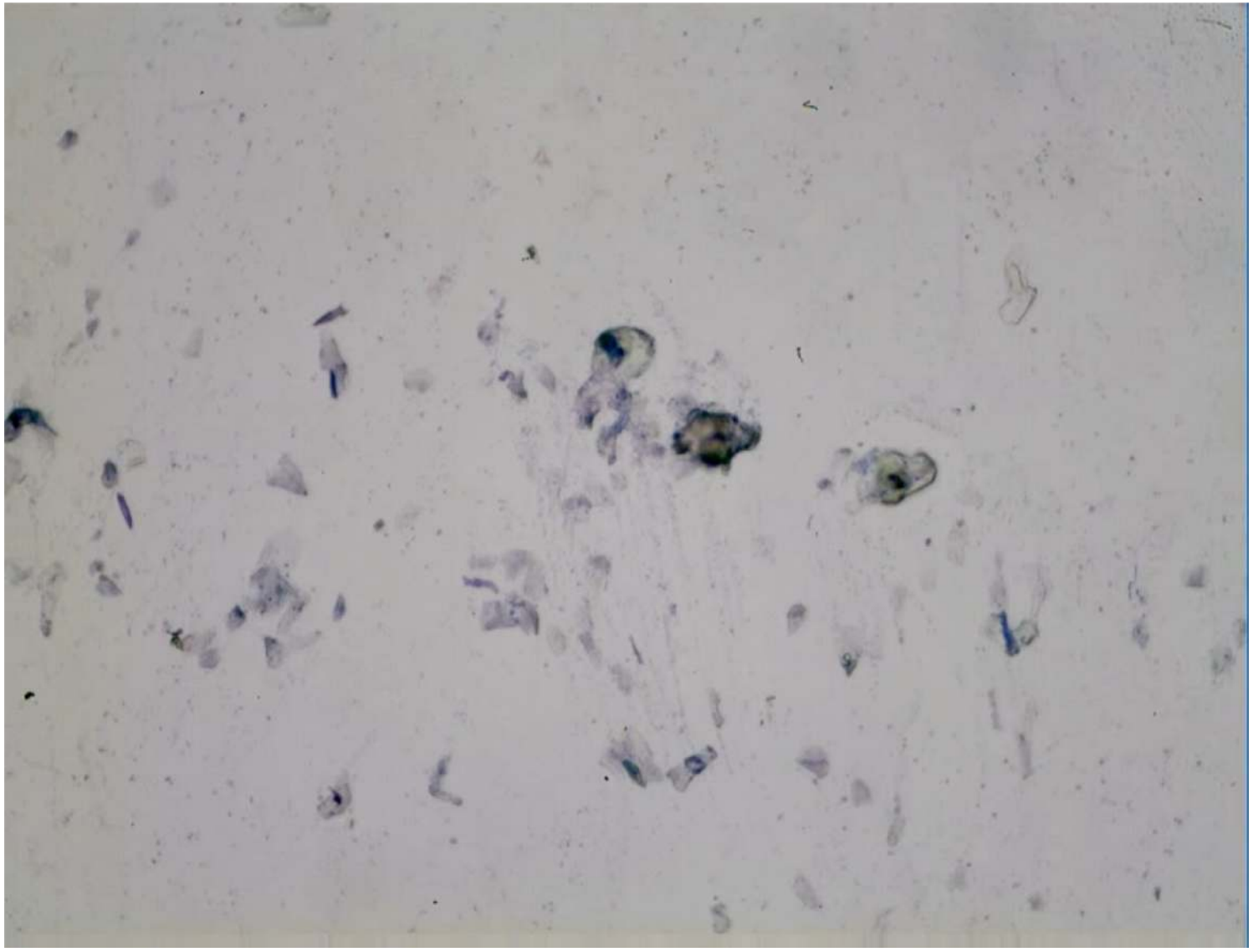
Tim Nuttall

Otitis is one the most common problems seen in dogs. Most acute cases can be managed with topical polyvalent ear preparations. However, these cases frequently evolve into chronic or recurrent otitis that is much harder to resolve. Ongoing cycles of infection and inflammation will lead to chronic pathological changes and select for antimicrobial resistance that make management much more challenging. Diagnosis and management of the underlying triggers for the otitis is crucial, but clinicians must also understand

- Identify and manage the primary cause;
- Correct predisposing factors (if possible);
- Remove debris and discharge;
- Manage the secondary infection; and
- Reverse chronic pathological changes.



DIAGNÓSTICO CITOLÓGICO EM OTITES



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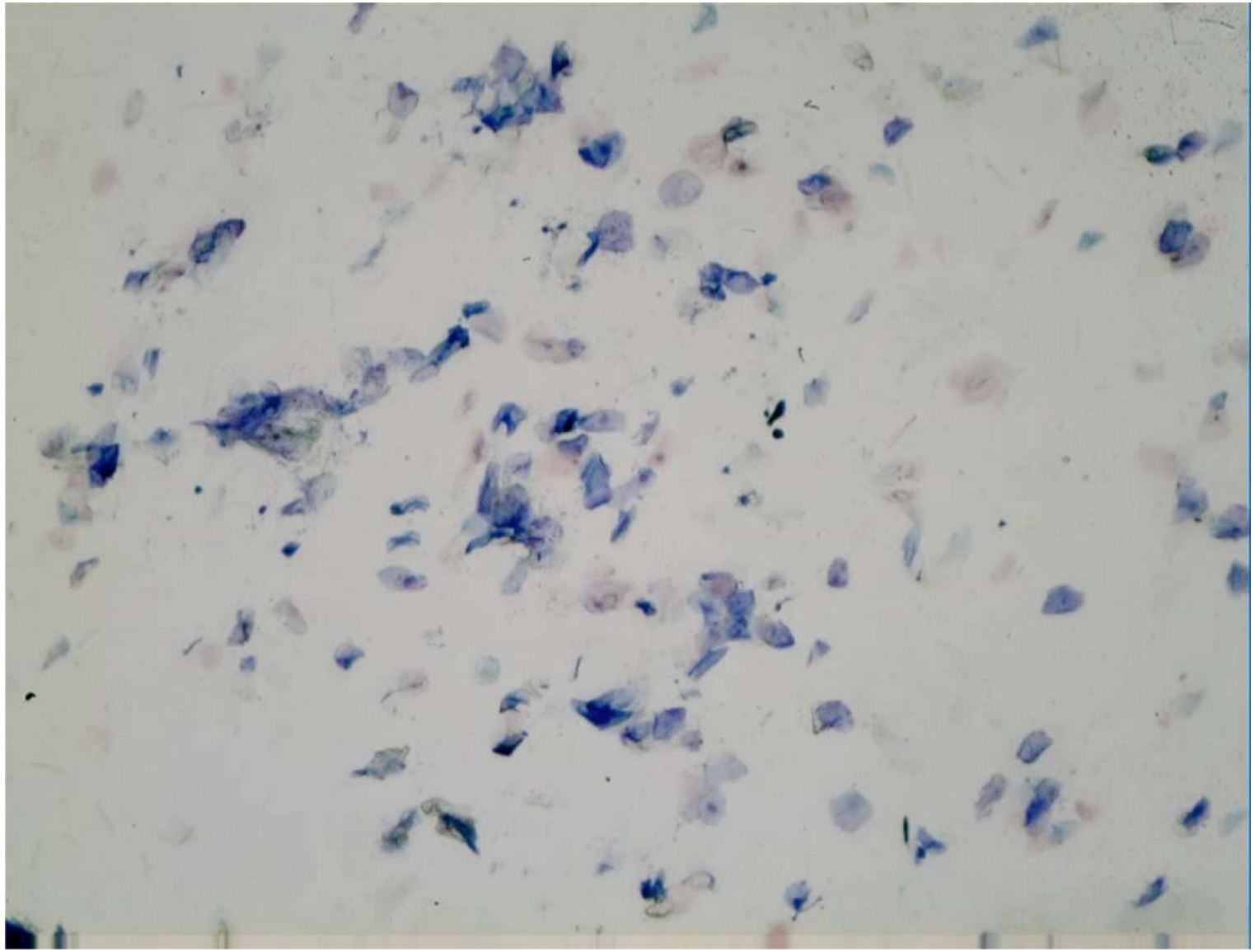

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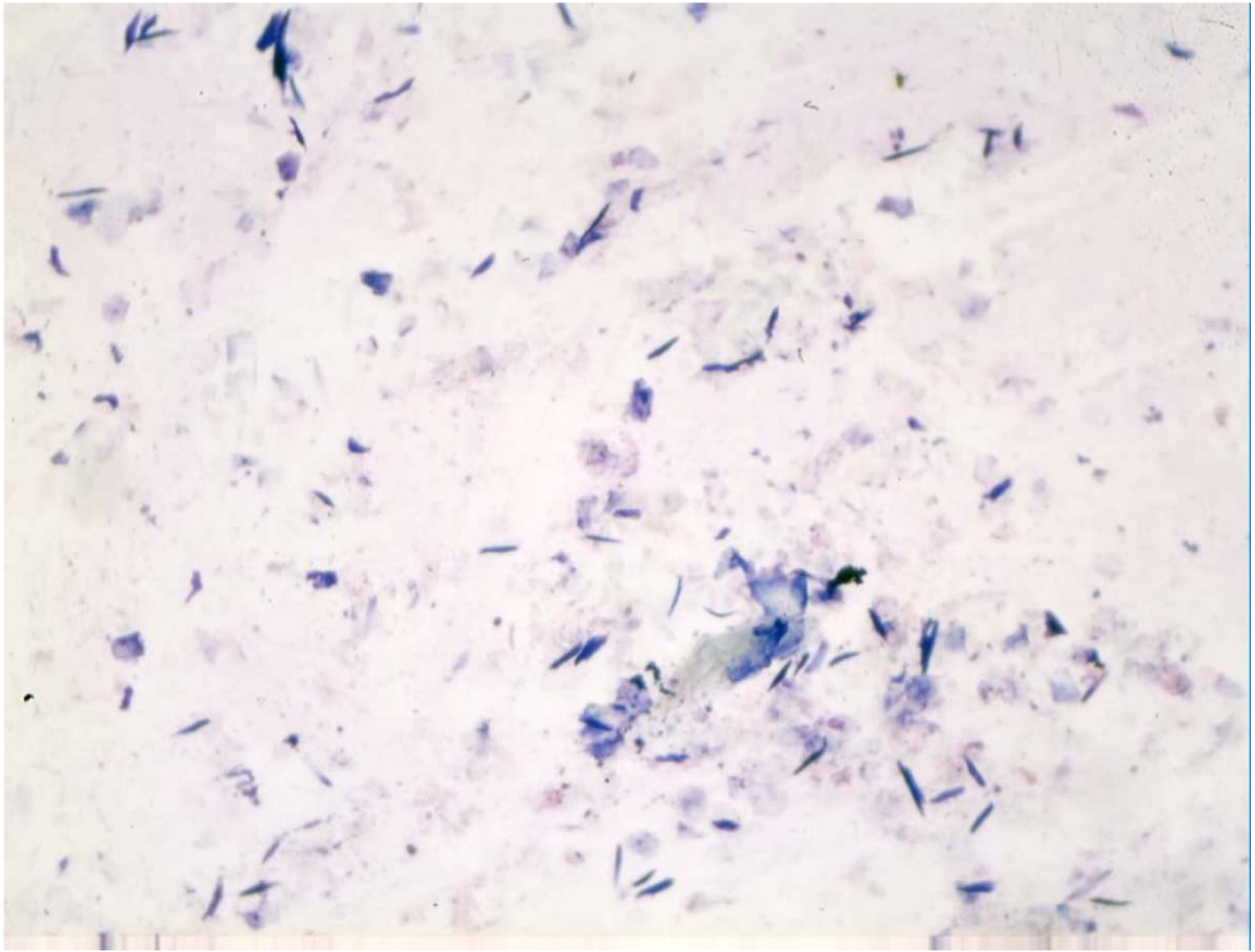

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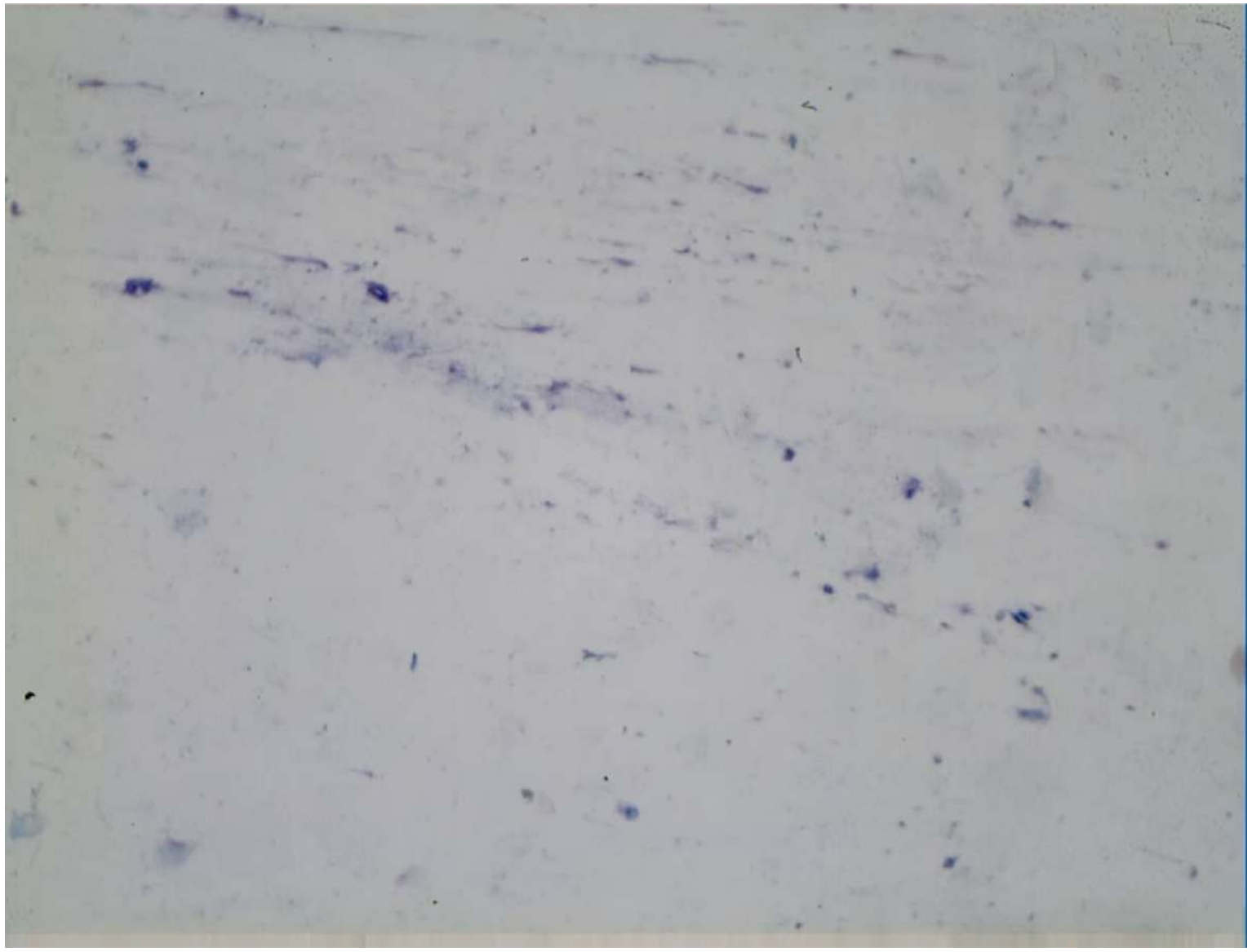

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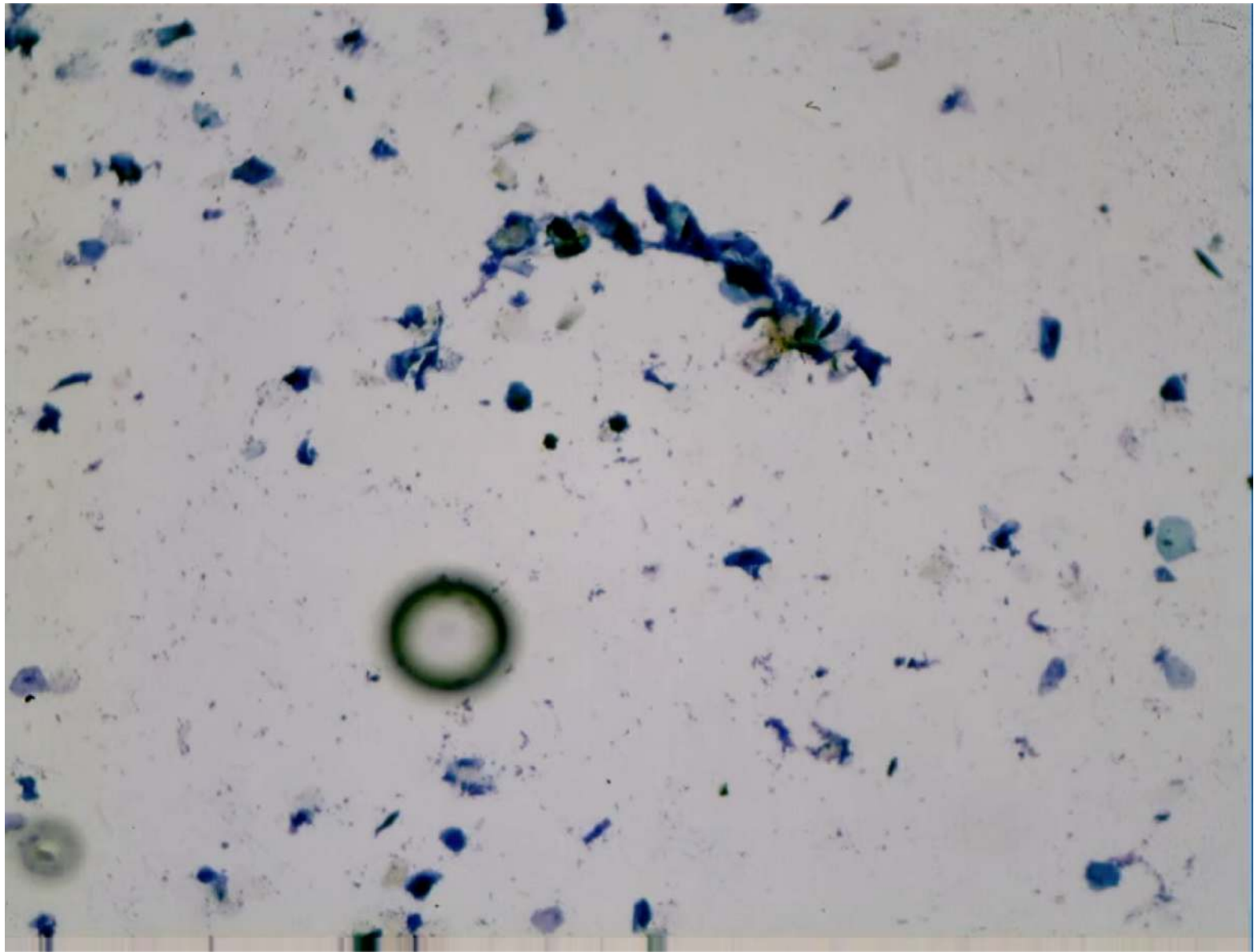
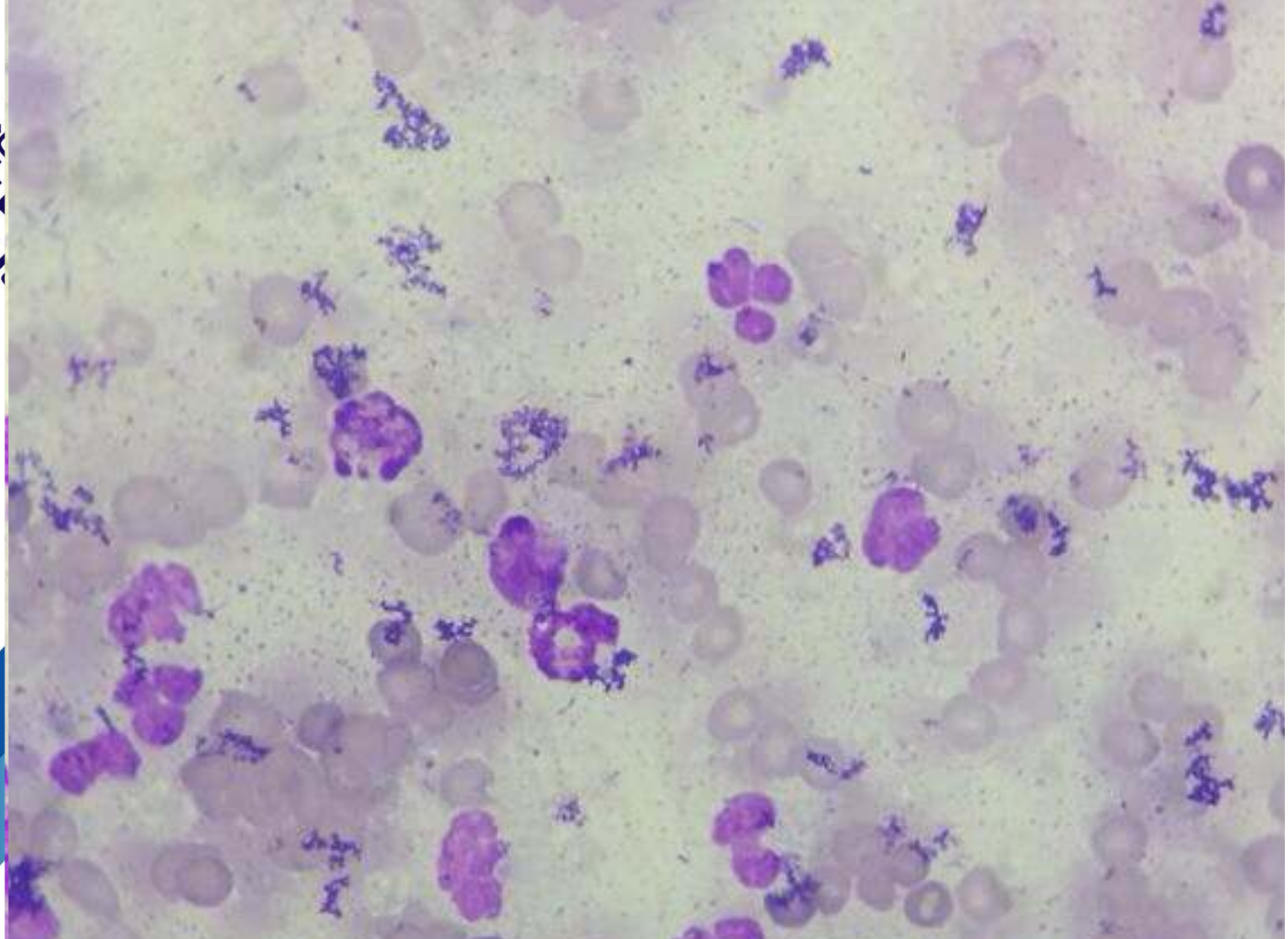




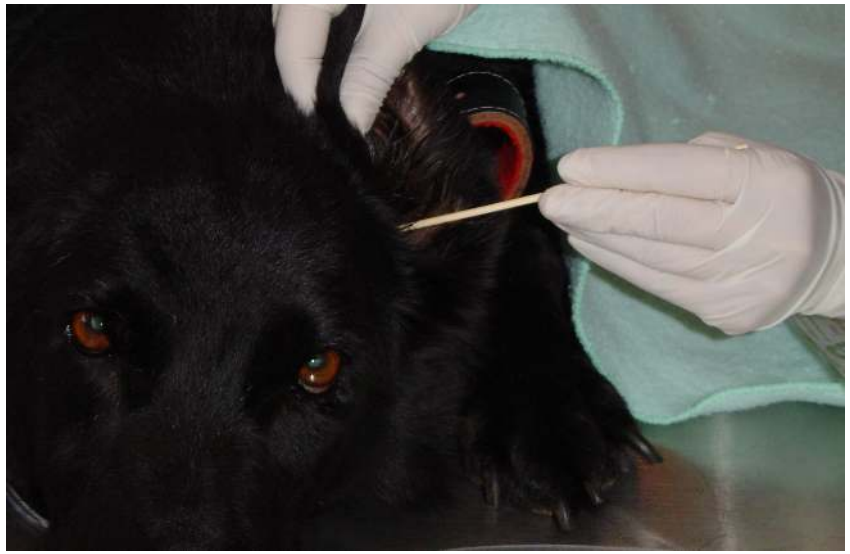
marcio, 2017

equalis APRESENTA:

CULTURA E ANTIBIOGRAMA DE ORELHA

Principais agentes identificados em otite

- **Gram +**
- *S.* coagulase positivo e negativo – S. pseudointermedius
- *S. Schleiferi coagulans*
- **Gram -**
- *Proteus* sp.
- ***Pseudomonas* sp.**
- *E. coli*
- *Klebsiella sp.*
- **Leveduras**
- *M. pachydermatis*
- *Candida albicans*



Danny W. Scott; Williem H. Miller, and Craig E. Griffin: Miller and Kirk's Small Animal Dermatology, Saunders, 6 ed, 2000

Koneman, *et al*., 2006

equalis APRESENTA:

2º FÓRUM VETWORK OTOLOGIA SÃO PAULO · 2018

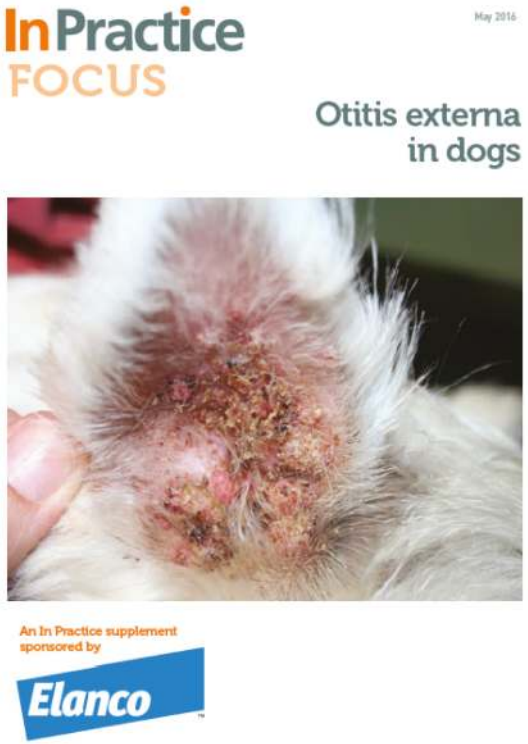


Table 1: Common organisms found in normal and diseased ears

Microorganism found in	
Normal ears	**Ears with otitis externa**
*Malassezia pachydermatis**	*Malassezia* species*
Lipid-dependent *Malassezia* species (eg, *Malassezia furfur* and *Malassezia obtusa*)	*Staphylococcus pseudintermedius**
*Staphylococcus pseudintermedius**	*Pseudomonas aeruginosa**
Staphylococcus schleiferi subspecies *coagulans*	*Proteus mirabilis**
Coagulase-negative *Staphylococcus* species †	β-streptococci
Bacillus species*	*Corynebacterium* species
Corynebacterium species†	*Enterococcus* species
Streptococci species	*Escherichia coli*
Micrococcus species	

* Organisms are common

† May not be reported by some laboratories as considered 'normal'

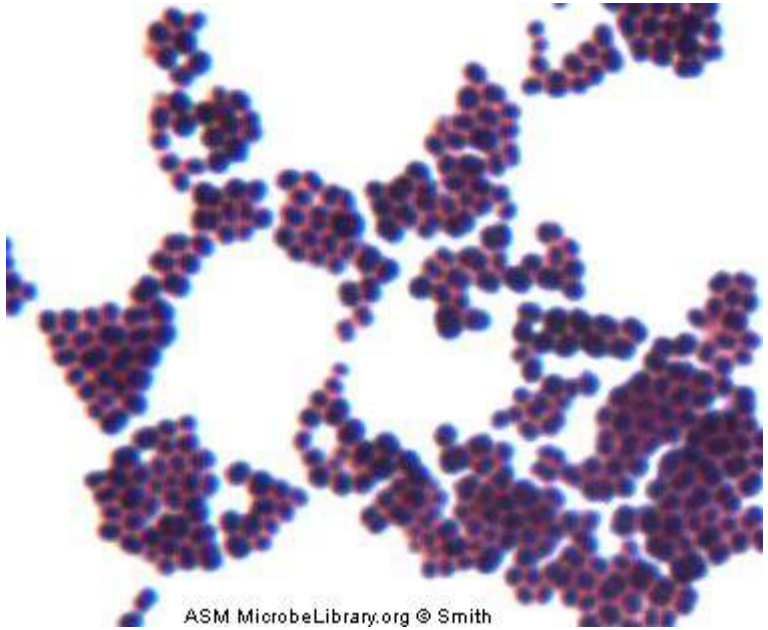
Identificação gram +

- Amostra semeada em meio rico ágar sangue

www.life.umd.edu/.../Media.htm

Identificação gram +

- Coloração de Gram



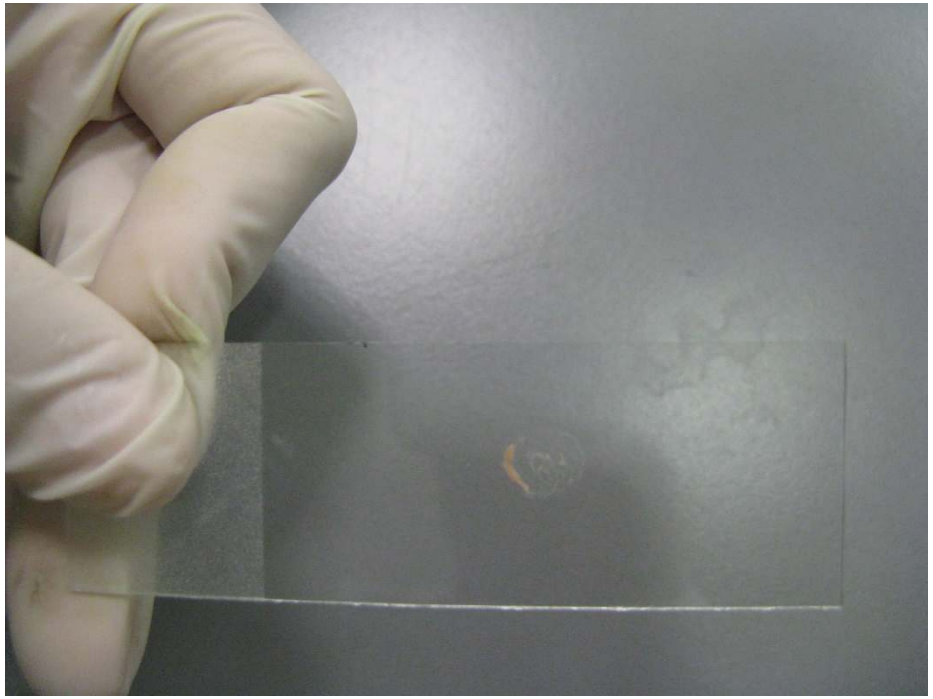
www.life.umd.edu/.../Media.htm

Identificação gram +

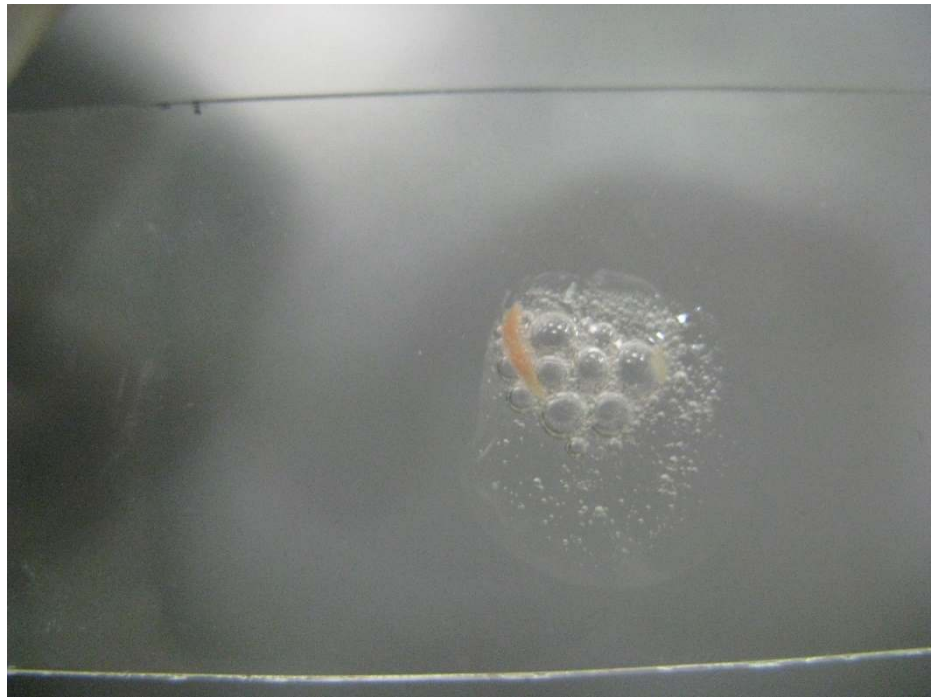
- **PROVA DA CATALASE**

Diferenciação entre *Staphylococcus* sp e *Streptococcus* sp

Hovet-AM, 2009



Hovet-AM, 2009

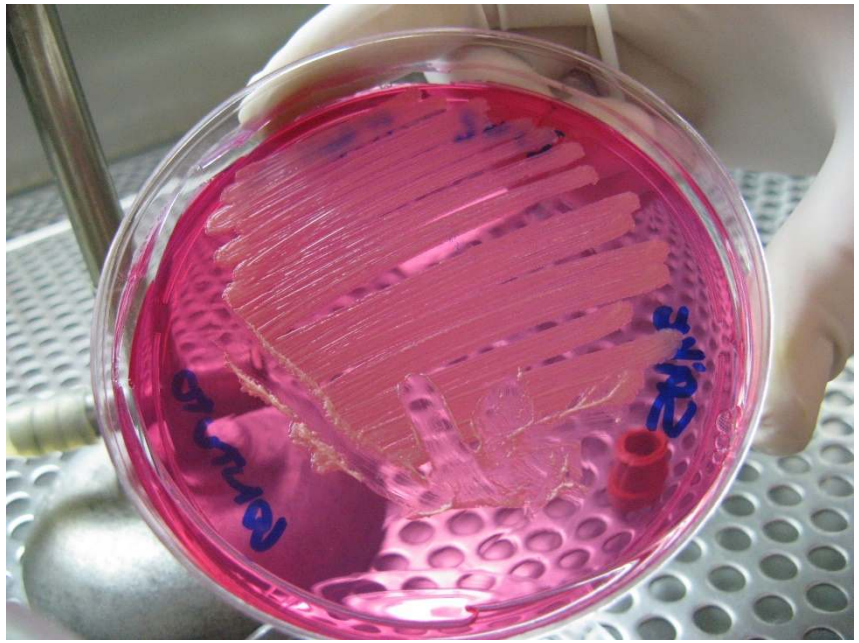


- **COCOS CATALASE POSITIVA = *Staphylococcus* sp**

Identificação gram +

- **PROVA DA COAGULASE**

1) Plasma de coelho liofilizado
2) Amostra a ser testada de cultivo após 24 horas

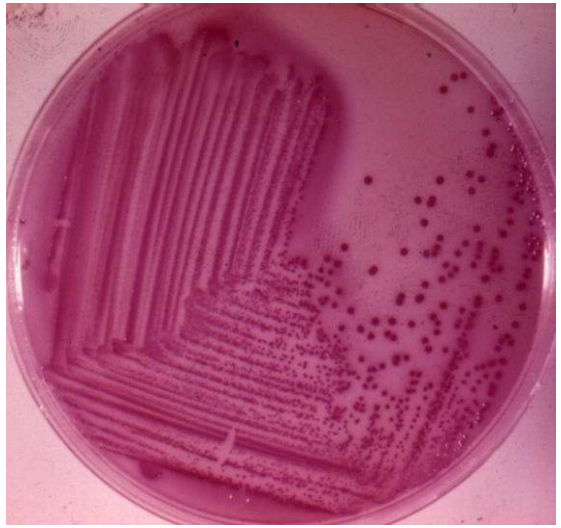


Hovet-AM, 2009

Hovet-AM, 2009

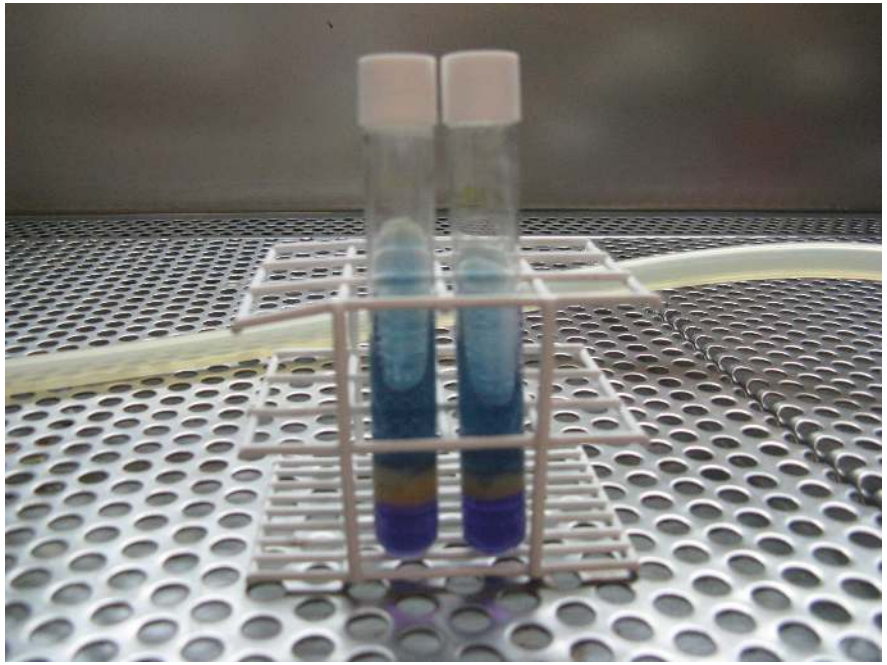
Identificação gram -

- Amostra semeada em meio rico ágar sangue e meio seletivo ágar MacConkey

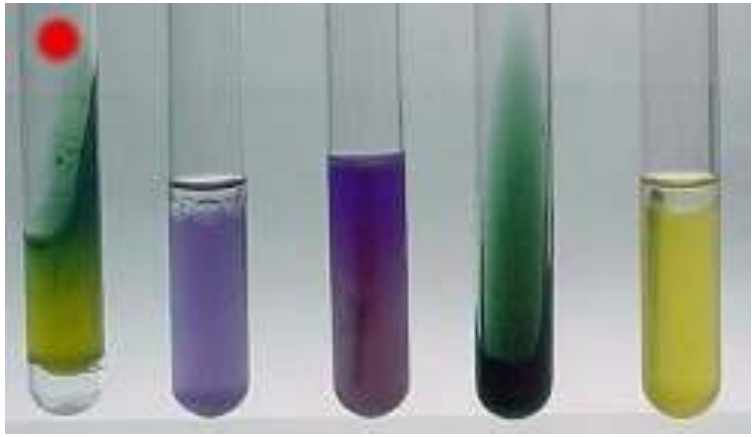


www.life.umd.edu/.../Media.htm

Identificação gram -



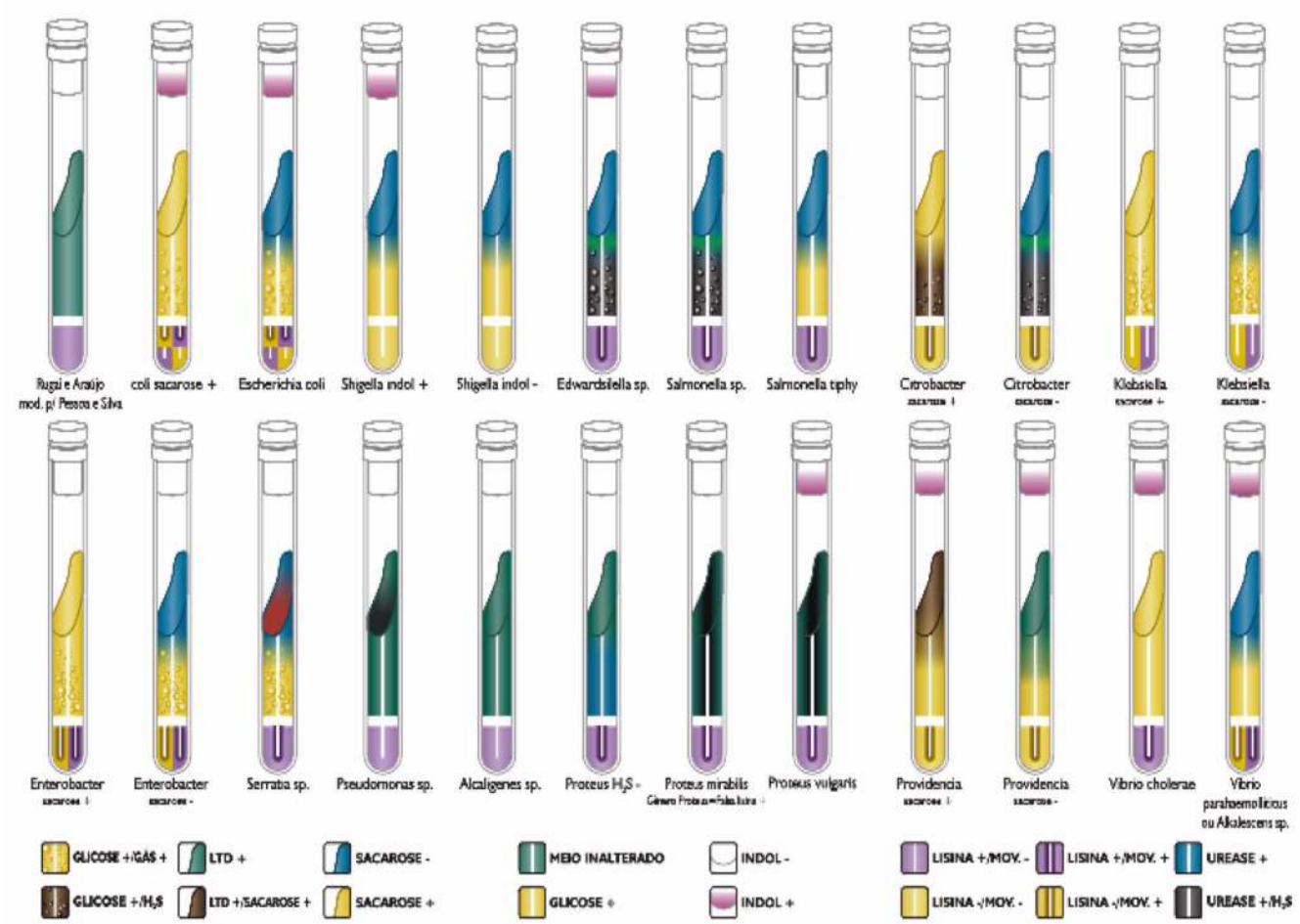
Rugai - modificado



Hovet, 2007

Identificação gram -

- Rugai modificado por Pessoa e Silva



ALGUNS CRITÉRIOS...

spanish.peopledaily.com.cn

ALGUNS CRITÉRIOS...

A determinação dos halos de sensibilidade, intermediário ou resistência. Os valores do MIC são determinados são determinados pelos comitês internacionais CLSI (Clinical and Laboratory Standards Institute) e EUCAST (European Committee on Antimicrobial Susceptibility Testing)

Esses pontos são determinados pelo farmacocinética, farmacodinâmica, clínica e dados microbiológicos

Objetivo auxiliar o clínico a instituir uma terapêutica antimicrobiana

Provas de susceptibilidade – não leva em consideração condições que afetam o resultado da terapia antimicrobiana,
como imunodeficiência do hospedeiro, comorbidades, virulência, entre outros

Sensível – alta probabilidade de sucesso terapêutico (aprox. 90%) – Humanos
Resistente – não prevê falha no tratamento, mas redução na taxa de cura de até 60% - Regra 60%-90%

Existem vários fármacos onde não se tem determinação para ação nas espécies veterinárias assim se usa os pontos de cortes de humanos (sulfonamidas/trimetoprim, cloranfenicol ou rifampicina utilizadas para infecções de S. pseudintermedius (MRSP)

ALGUNS CRITÉRIOS...

Quando se utiliza pontos de cortes adaptados de humanos ou outras espécies podem comprometer a eficácia do tratamento

Os pontos de cortes são definidos pela farmacocinética e farmacodinâmica para a espécie e tecido, além da dosagem específica. AMOXICILINA COM CLAVULANATO pode ser utilizado duas a três vezes por dia em doses de 11 a 25mg/kg via oral

Fármacos dependentes de tempo como B-lactâmicos são influenciados pela formulação. Comprimidos orais pode ter um
ponto de corte diferente de administração intravenosa de ação prolongada, mesmo que a dose total seja a mesma

Atualmente não existem ponto de corte para terapia tópica. A concentração é muito maior daquela testada para concentração sérica.

A concentração pode exceder o MIC de patógenos 100.000 vezes. Esses dados indicam que infecções causadas por cepas resistentes pelas provas de sensibilidade podem ser tratadas com sucesso pela terapia tópica. Porém precisa ser validade cientificamente.

Table 2. Bacteria for which host- and infection-specific clinical breakpoints exist in veterinary dermatology according to Clinical Laboratory Standards Committee (CLSI).[21] Drugs for which only human-derived breakpoints are available are highlighted in bold

	Animal/bacterial combinations for which clinical breakpoints for systemic treatment of skin infections exist	
Antibiotic	Dogs	Cats
Amoxicillin-clavulanic acid	*Escherichia coli*, *Staphylococcus* spp.	*E. coli*, *Staphylococcus* spp., *Streptococcus* spp., *Pasteurella* spp.
Ampicillin	*E. coli*, *Streptococcus canis*, *Staphylococcus pseudintermedius*	None*
Cefalothin	*E. coli*, *Staphylococcus aureus*, *S. pseudintermedius*, *Streptococcus* spp.	None*
Cefazolin	*E. coli*, *S. aureus*, *S. pseudintermedius*, *Pasteurella multocida*, *Streptococcus* spp.	None*
Cefovecin	None	None
Cefpodoxime	*E. coli*, *S. aureus*, *S. pseudintermedius*, *Pasteurella multocida*, *Proteus mirabilis*, *Streptococcus* spp.	None*
Chloramphenicol	None*	None*
Clindamycin	*Staphylococcus* spp., *Streptococcus* spp.	None*
Difloxacine	Enterobacteriaceae, *Staphylococcus* spp.	None*
Doxycycline	*Staphylococcus pseudintermedius*	None*
Enrofloxacin	Enterobacteriaceae, *Staphylococcus* spp.	None‡
Gentamicin	None†	None*
Marbofloxacin	Enterobacteriaceae, *Staphylococcus* spp.	None‡
Orbifloxacin	Enterobacteriaceae, *Staphylococcus* spp.	None‡
Pradofloxacin	*E. coli*, *S. pseudintermedius*	*E. coli*, *S. pseudintermedius*, *Staphylococcus felis*, *Staphylococcus aureus*, *S. canis*, *Pasteurella* spp.
Rifampicin	None*	None*
Trimethoprim-sulfamethoxazole	None*	None*
Tetracycline	*Staphylococcus* spp.	None*
Ticarcillin ± clavulanic acid	None*	None*

*Breakpoints (BP) from human medicine or another animal species are used instead.
†A generic BP exists for Enterobacteriaceae and *Pseudomonas* spp. in dogs, but this is not specific to any infection type.
‡A generic BP exists for skin and soft tissue infections in cats, but this is not specific to any bacterial species.

Table 3. Examples of antimicrobial concentrations in veterinary products for topical use and minimum inhibitory concentrations (MICs)

Active compound	Examples of topical products containing compound	Concentration in commercial product (mg/L)*	Reported MIC ranges (mg/L)	Reported MIC90 (mg/L)	References for MIC ranges
Gentamicin	Otomax Vet/EasOtic®	4,119/2,348	*Pseudomonas aeruginosa*: 0.25–16	8	54
Miconazole	EasOtic®/Surolan® Vet	13,100/19,970	Coagulase-positive staphylococci: 1–8	NA	55
Polymyxin B	Surolan® Vet	654	Coagulase-positive staphylococci: 0.25–64	NA	55
Fusidic acid	Canaural®	4,150	Coagulase-positive staphylococci: 0.06–1,024	0.5–4	56
Framycetin†	Canaural®	4,300	Coagulase-positive staphylococci: ≤0.5–64	NA	55
			P. aeruginosa: 8–1,024	128–256	57
Mupirocin	Muricin®	20,000	*Staphylococcus pseudintermedius*: ≤0.03 to >1,024	NA	58
			Coagulase-positive staphylococci: 0.06–16	0.125–1	56
Enrofloxacin	Baytril® Otic	5,000	*P. aeruginosa*: 0.015–32	32	54
			P. aeruginosa: 0.125 to >64	NA	59
Florfenicol	Osurnia®	10,000	*Escherichia coli*: 1->64	16	60
			S. pseudintermedius: 0.25–32	8	
			Staphylococcus spp: 2–32	8	
			Streptococcus spp.: 0.5->128	2->128	
			Proteus spp.: 4–16	8	
			Enterococcus spp.: 1–8	8	
			Pseudomonas spp.: >64	1,024	

NA data not available.

*The concentrations stated for Canaural® and Muricin® represent mg/kg instead of mg/L.

†Framycetin is a synonym for neomycin B and MIC data are reported here for neomycin.

Resistência a Meticilina (MRSP)

Regra – S aureus resistência a meticilina conforme determinado pela oxacilina, cefoxitina, detecção do mecAou o produto PBP2a deve ser relatado a todos os B-lactâmicos – exceto os licenciados para tratar (ceftarolina, ceftobiprole) não liberados para veterinária – humano
Assim foi estabelecido para a veterinária sem qualquer evidencia microbiológica ou clínica

Essa regra pode levar a falsa resistência aos B-lactâmicos em cepas que expressão baixa resistência a meticilina

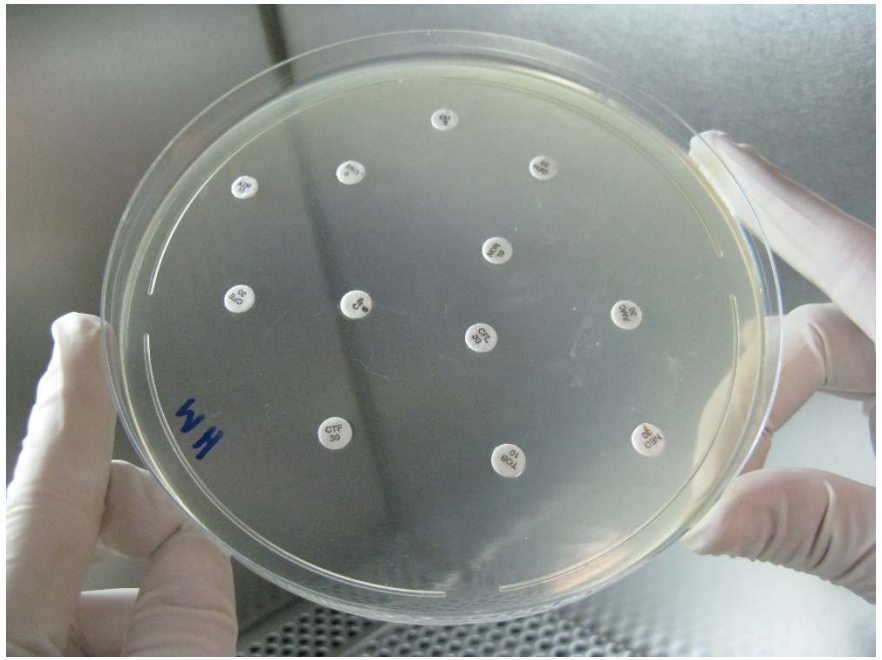
A cefalexina é uma das mais ativas cefalosporinas contra estafilococos e tem sido associada com cura clínica de (90 – 100%) para infecções cutâneas por MRSA não complicadas em humanos

Consenso para dermatologia veterinária – qualquer estafilococos resistente a oxacilina deve ser relatado resistente a B-lactâmicos licenciados para uso na veterinária

Porém se o tratamento já foi iniciado clavulanato de amoxicilina ou cefalexina e o MIC da cepa bacteriana for baixo avaliar clinicamente antes de alterar a prescrição
As provas de susceptibilidade tem valor preditivo baixo para cepas resistentes

Cefoxitina não apresenta ser um bom substituto para detecção MRSP por difusão em disco

TÉCNICA DE DIFUSÃO EM ÁGAR

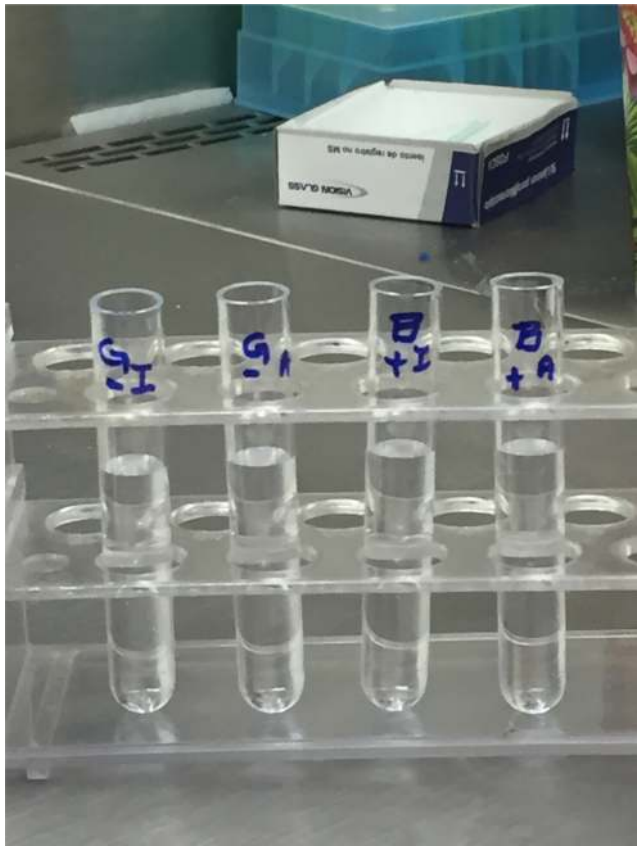


marcio, 2015

ANTIBIOGRAMA

( ) Ampicilina	10 mcg	
( ) Amoxicilina	10 mcg	Resistente (0 mm); + 20 mm
( ) Amicacina	30 mcg	Sensível (23 mm) ; + 17mm
( ) Bacitracina	0.04 U	
( ) Cefalexina	30 mcg	Resistente (0 mm) ; + 18 mm
( ) Cefalotina	30 mcg	Resistente (0 mm) ; + 18 mm
( ) Ceftuofur		
( ) Cloranfenicol	30 mcg	Resistente (12 mm); + 21 mm
( ) Ciprofloxacina	5 mcg	Intermediário (18 mm); + 21mm
( ) Clindamicina	2 mcg	Resistente (0 mm) ; + 21 mm
( ) Enrofloxacina		Sensível (25mm); + 23 mm
( ) Eritromicina	15 mcg	Resistente (15 mm) ;+ 21 mm
( ) Estreptomicina	10 mcg	
( ) Gentamicina	10 mcg	Sensível (15 mm) ; + 15mm
( ) Lincomicina	2 mcg	
( ) Neomicina	30 mcg	
( ) Norfloxacina	5 mcg	Resistente (0 mm) ; + 17 mm
( ) Polimixina B	300 mcg	

TECNOLOGIA VITEK




PLASTIC
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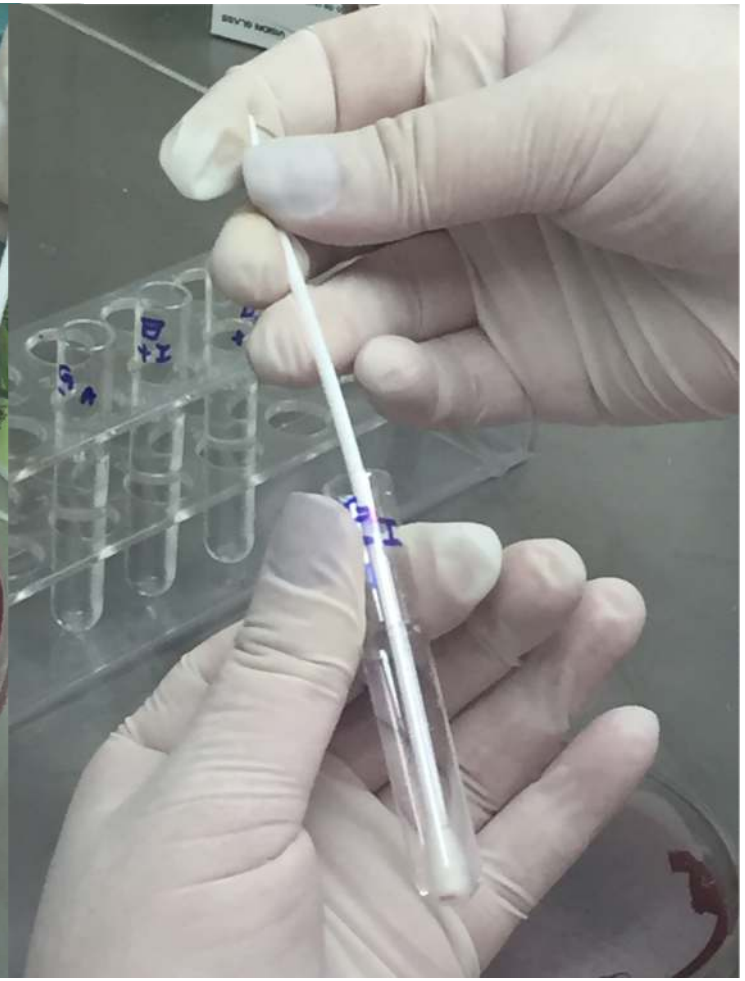


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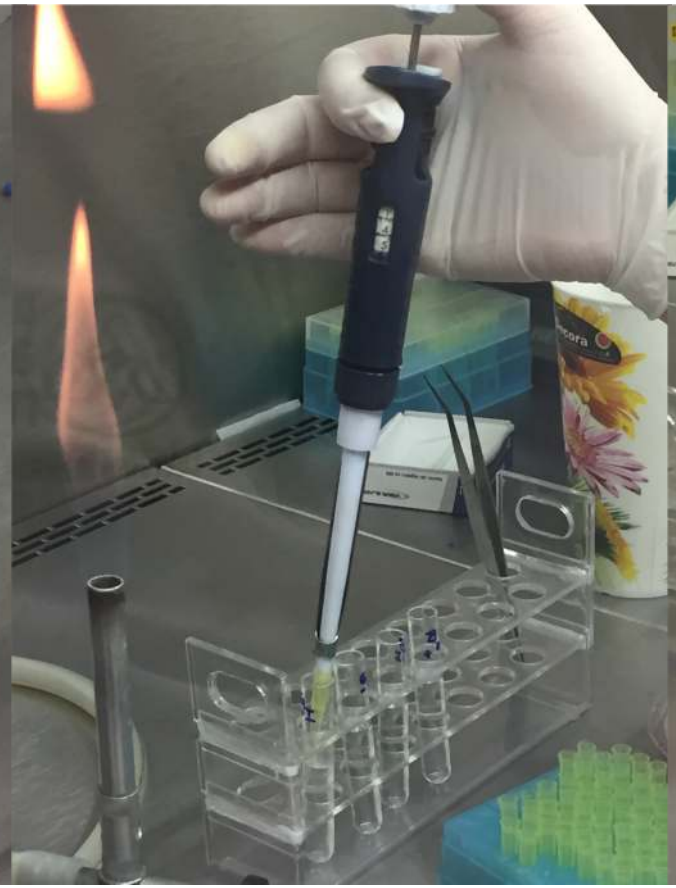


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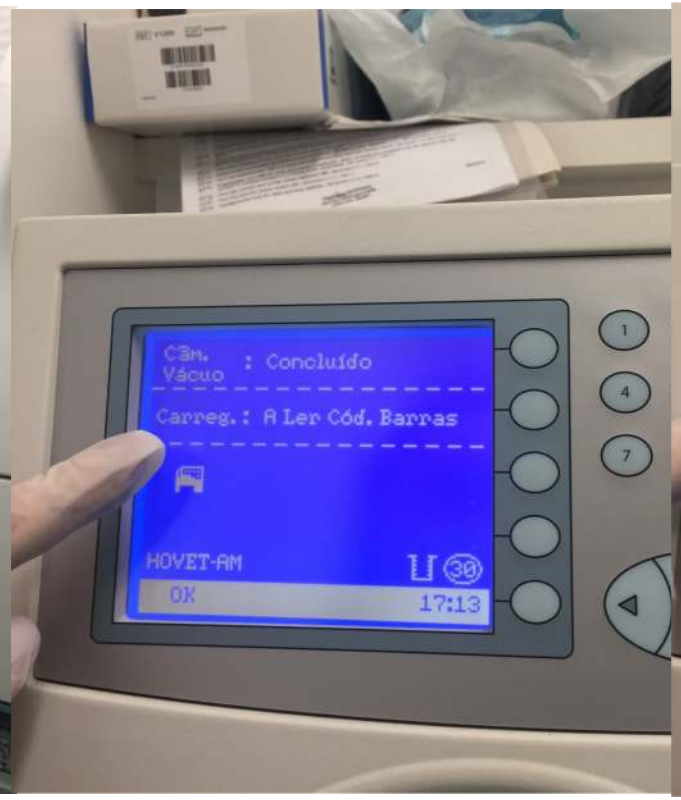
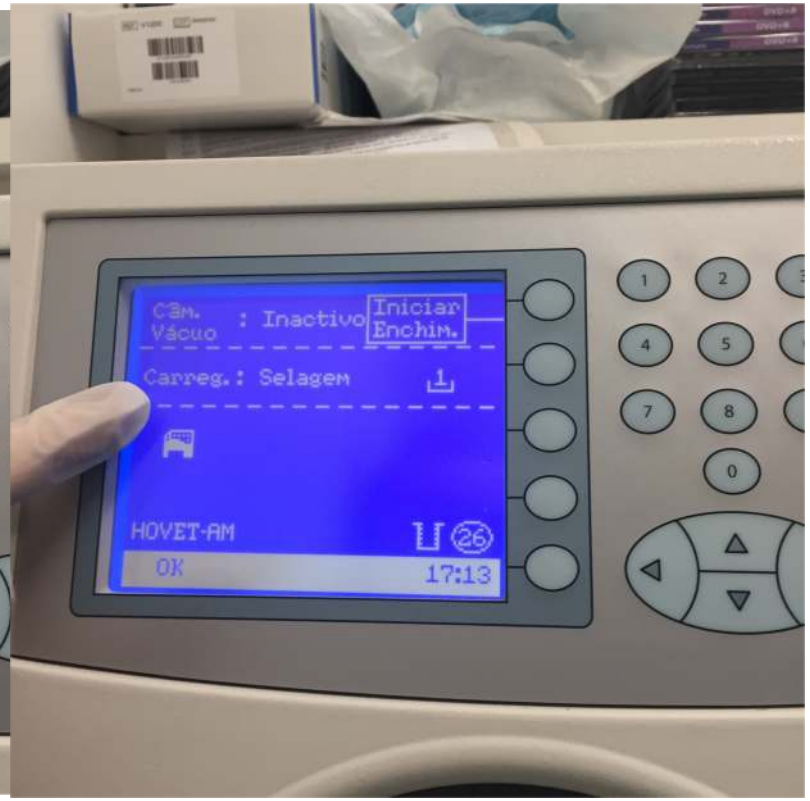
equalis APRESENTA:

2º FÓRUM VETWORK OTOLOGIA SÃO PAULO · 2018





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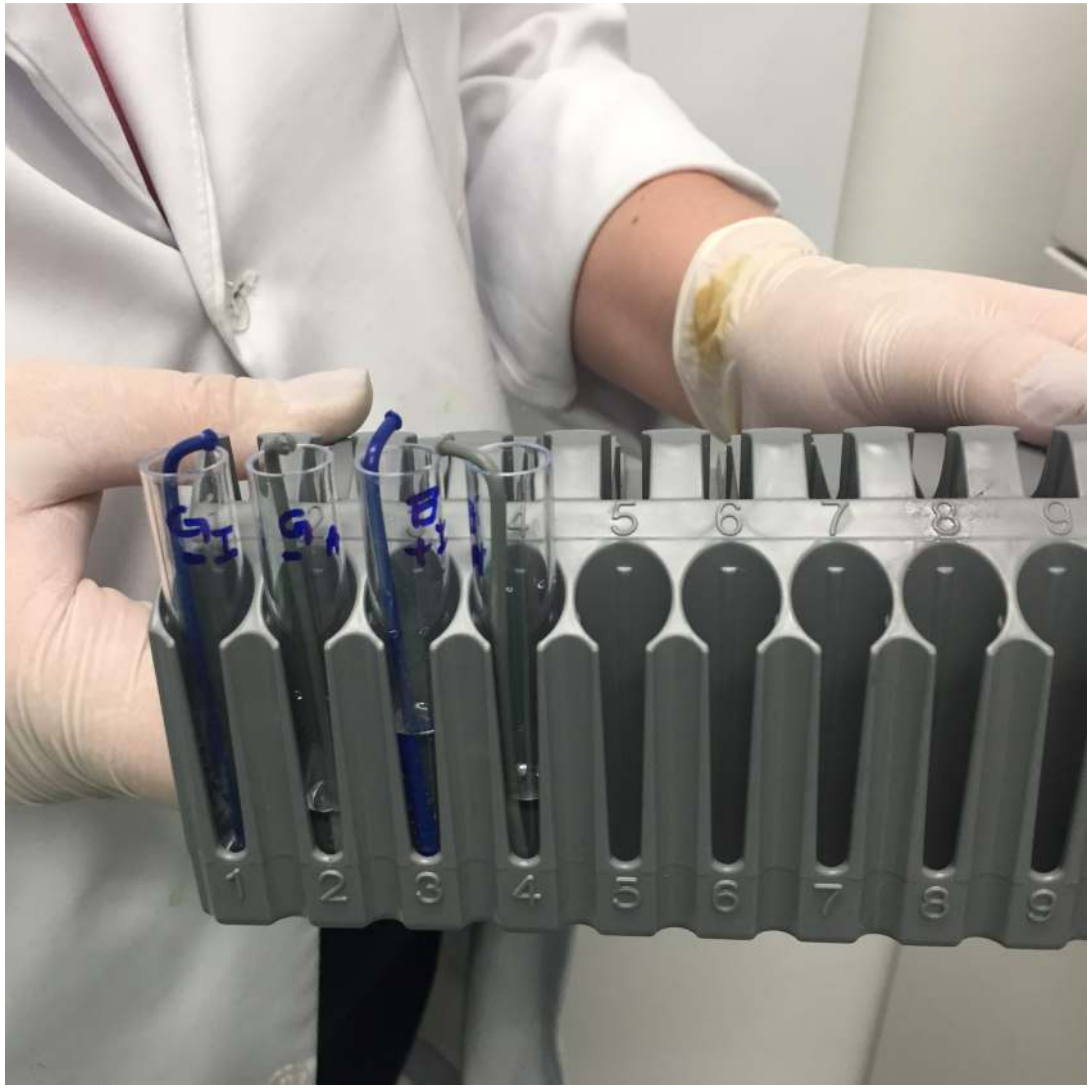

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2º FÓRUM VETWORK OTOLOGIA SÃO PAULO · 2018

CASO 1

Proprietário	:	Jean
Requisitante	:	Dr. Ronaldo Lucas
Material	:	Orelha

Antimicrobiano	Disco Difusão – Halo de Inibição (mm)				Vitek® MIC (ug/mL)			
	Resultado (mm)	S	I	R	S	I	R	Resultado (ug/mL)
Amicacina (AMI) 30 mcg *◊	**(S)** 22	≥ 17	15-16	≤ 14	≤ 16	32	≥ 64	≤ 2 Sensível
Aztreonama (ATM) 30 mcg ◊		≥ 22	16-21	≤ 15	≤ 8	16	≥ 32	
Cefepima (CPM) 30 mcg ◊		≥ 18	15-17	≤ 14	≤ 8	16	≥ 32	
Ceftazidima (CAZ) 30 mcg ◊	**(S)** 24	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32	
Ciprofloxacina (CIP) 5 mcg ◊	**(S)** 30	≥ 21	16-20	≤ 15	≤ 1	2	≥ 4	
Enrofloxacina (ENO) 5 mcg *	**(I)** 18	≥ 21	17-22	≤ 16	≤ 0,5	1-2	≥ 4	0,5 Sensível
Gentamicina (GEN) 10 mcg *	**(S)** 17	≥ 16	13-15	≤ 12	≤ 2	4	≥ 8	≤ 1 Sensível
Imipenem (IPM) 10 mcg *◊	**(S)** 25	≥ 19	16-18	≤15	≤ 2	4	≥8	4 Intermediário
Marbofloxacina (MBF) 5 mcg *		≥ 20	15-19	≤ 14	≤ 1	2	≥ 4	≤ 0,5 Sensível
Meropenem (MER) 10 mcg *		≥ 19	16-18	≤ 15	≤ 2	4	≥ 8	
Neomicina (NO) 30 mcg *◊	**(R)** 15	≥ 17	13-16	≤ 12				
Norfloxacina (NOR) 10 mcg ◊	**(S)** 30	≥ 17	13-16	≤ 12	≤ 4	8	≥ 16	
Polimixina B (POL) 300U ◊	**(S)** 14	≥ 12	-	≤ 11	≤ 2	4	≥ 8	≥ 16 Resistente
Ticarcilina/Ac. Clavul. (TIC) 75 mcg *◊		≥ 24	16-23	≤ 15	≤ 16	32-64	≥ 128	
Tobramicina (TOB) 10mcg ◊	**(S)** 20	≥ 15	13-14	≤ 12	≤ 4	8	≥ 16	≤ 1 Sensível

** CLSI VET01-A4 vol. 33 no. 7 & CLSI VET01-S2 vol. 33 no. 8 – 2013 / ◊ CLSI M100-S25 vol. 35 no. 3 – 2015*

AGENTE IDENTIFICADO: ***Pseudomonas aeruginosa***

"A análise de qualquer exame depende da correlação clínica, aspectos epidemiológicos, interação medicamentosa em uso e aspectos fisio-patológicos do paciente."

Obs.: Antibióticos não eficazes contra *P. aeruginosa* de acordo com a CLSI VET01-A4 (2013): Amoxicilina+Clavulanato; Ampicilina; Azitromicina; Cefalexina; Cefalotina; Cefazolina; Cefovecina; Cefoxitina; Cefpodoxima; Ceftiofur; Claritromicina; Clindamicina; Cloranfenicol, Doxiciclina; Eritromicina; Neomicina, Nitrofurantoína; Oxacilina; Penicilina G; Rifampicina; Sulfametoxazol+Trimetoprim; Tetraciclina, Vancomicina.

Caso 2

Tipo de carta: GP Aparelho de teste: 000016FDD121 (HOVET-AM)
Tipo de carta: AST-GP69 Aparelho de teste: 000016FDD121 (HOVET-AM)

Bionúmero: 050402065763231

Comentários:	

Informações da Identificação	**Carta:**	GP	**Nº de Lote:**	242374610	**Data de Validade:** 17/Mar/2017 13:00 CDT
	Concluído:	16/Ago/2016 00:13 CDT	**Estado:**	Final	**Hora da Análise:** 4,25 Horas
Microrganismo Seleccionado	99% Probabilidade	**Staphylococcus aureus**			
	Bionúmero:	050402065763231			**Confiança:** Excelente identificação
Microrganismo FRS					

Microrganismos de Análise e Testes a Separar:

Mensagens da Análise:

Resistência de Baixo Nível - uma CMI de 2, 4, 32, 64 para a mupirocina representa o intervalo intermédio completo (2-256).

O(s) Antibiótico(s) seguinte(s) não estão pedidos:
Ampicilina, Gentamicina Alto Nível (Sinergia),

Bionúmero: 050402065763231

Carta apenas para uso veterinário

Informações de Sensibilidade	Carta: AST-GP69	Nº de Lote: 134399120	Data de Validade: 17/Nov/2017 12:00 CST
	Concluído: 16/Ago/2016 06:58 CDT	Estado: Final	Hora da Análise: 11,00 Horas

Antibiótico	CMI	Interpretação	Antibiótico	CMI	Interpretação
Teste de screening de cefoxitina	NEG.	*+	Resistência induzida a clindamicina	NEG.	-
Benzilpenicilina	>= 0,5	R	Eritromicina	>= 8	R
Ampicilina			Clindamicina	>= 8	R
Ampicilina/sulbactam	<= 2	*R	Vancomicina	<= 0,5	S
Oxacilina R	>= 4	R	Tetraciclina R	>= 16	R
Imipenem S	<= 1	*R	Nitrofurantoína	<= 16	S
Gentamicina Alto Nível (Sinergia)			Ácido Fusídico	<= 0,5	S
Gentamicina	>= 16	R	Mupirocina	<= 2	
Kanamicina	>= 64	R	Cloranfenicol R/R	>= 64	R
Enrofloxacina	>= 4	R	Rifampicina	<= 0,5	S
Marbofloxacina R	>= 4	R	Trimetoprim/Sulfametoxazol	>= 320	R

+= Antibiótico Deduzido *= Modificação do AES **= Modificado pelo Utilizador

Resultados AES:	Última Modificação: 19/Abr/2016 15:40 CDT	Conjunto de Parâmetros: HOSPITAL VETERINARIO

Nível de Confiança:	Consistente com Correcção	
Fenótipos assinalados para revisão:	MUPIROCINA	RESISTÊNCIA DE BAIXO NÍVEL
	BETA-LACTÂMICOS	MODIFICAÇÃO DA PBP (mecA)
	MACRÓLIDOS/LINCOSAMIDAS/ESTREPTOGRAMINAS	MLSB+SA CONSTITUTIVO

Fenótipos

Família de Antibióticos	Fenótipos Detectados
BETA-LACTÂMICOS	MODIFICAÇÃO DA PBP (mecA)
AMINOGLICOSÍDEOS	RESISTENTE KAN TOB GEN (APH(2")+AAC(6'))
QUINOLONAS	RESISTENTE,PARCIALMENTE RESISTENTE,SELVAGEM
MACRÓLIDOS/LINCOSAMIDAS/ESTREPTOGRAMINAS	MLSB+SA CONSTITUTIVO,MLSB CONSTITUTIVO
GLICOPEPTÍDEOS	SELVAGEM
TETRACICLINAS	MODIFICAÇÃO DO ALVO (TET M),PARCIALMENTE RESISTENTE (EFLUXO TET K)
FURANOS	SELVAGEM
ÁCIDO FUSÍDICO	SELVAGEM
MUPIROCINA	RESISTÊNCIA DE BAIXO NÍVEL,SELVAGEM
FENICÓIS	RESISTENTE
RIFAMICINAS	RESISTENTE (BAIXO NÍVEL),SELVAGEM
TRIMETOPRIM/SULFAMIDAS	RESISTENTE

Interpretações Terapêuticas

Antibiótico	Alterações de Interpretação	Motivo (Regra ou Fenótipo)
Ampicilina/sulbactam	Alteração S a R	MODIFICAÇÃO DA PBP (mecA)
Imipenem	Alteração S a R	MODIFICAÇÃO DA PBP (mecA)

Diferenças CMI/Teste

Família de Antibióticos	Antibiótico(s)/Teste	Fenótipos Detectados	Descrição dos Resultados
	Teste de screening de cefoxitina		Alterado de - para +

Deduções de Antibióticos

Nenhum

REFERÊNCIAS PARA MIC ***(mínima concentração inibitória) para Staphylococcus sp.***

Antimicrobiano	MIC (ug/mL)		
	S	I	R
Amicacina (AMI) 30 mcg *	≤ 16	32	≥ 64
Amoxicilina/Ac. Clavul. (AMC) 10 mcg*	≤ 0,25	-	≥ 0,5
Ampicilina+Sulbactam *	≤ 8	-	≥ 16
Azitromicina (AZI) 15 mcg ◊	≤ 2	4	≥ 8
Cefalexina (CFE) 30 mcg #	≤ 2	4	≥ 8
Cefovecina (CEF) 30 mcg #	≤ 2	4	≥ 8
Cefoxitina (CFO) 30mcg *◊	≤ 4	-	≥ 8
Ciprofloxacina (CIP) 5 mcg ◊	≤ 1	2	≥ 4
Clindamicina (CLI) 2mcg *	≤ 0,5	1 a 2	≥ 4
Cloranfenicol (CLO) 30 mcg *	≤ 8	16	≥ 32
Doxiciclina (DOX) 30 mcg ◊	≤ 4	8	≥ 16
Enrofloxacina (ENO) 5 mcg *	≤ 0,5	1 a 2	≥ 4
Eritromicina (ERI) 15mcg *	≤ 0,5	1 a 2	≥ 8
Gentamicina (GEN) 10mcg ◊*	≤ 4	8	≥ 16
Imipenem (IPM) 10 mcg *	≤ 1	2	≥ 4
Marbofloxacina (MBF) 5 mcg *	≤ 1	2	≥ 4
Nitrofurantoína (NIT) 300mcg *	≤ 32	64	≥ 128
Norfloxacina (NOR) 10 mcg ◊	≤ 4	8	≥ 16
Oxacilina (OXA) 1mcg *	≤ 0,25	-	≥ 0,5
Rifampicina (RIF) 5mcg *	≤ 1	2	≥ 4
Sulfam./Trimet. (SUT) 25 mcg *	≤ 38	-	≥ 76
Tetraciclina (TET) 30 mcg *	≤ 4	8	≥ 16
Tobramicina (TOB) 10 mcg ◊	≤ 4	8	≥ 16
Vancomicina (VAN) 30 mcg *◊	≤ 4	8 a 16	≥ 32

 # Antimicrob. Agents Chemother. July 2006 vol 50 no. 7 2286-2292 doi: 10.1128/AAC/00077-06

** CLSI VET01-A4 vol. 33 no. 7 & CLSI VET01-S2 vol. 33 no. 8 - 2013*

◊ CLSI M100-S25 vol. 35 no. 3 – 2015

Veterinary Dermatology

Vet Dermatol 2016; **27**: 468–e125 DOI: 10.1111/vde.12382

Prior antimicrobial use as a risk factor for resistance in selected *Staphylococcus pseudintermedius* isolates from the skin and ears of dogs

Gila Zur*, Bella Gurevich* and Daniel Elad†

*Veterinary Teaching Hospital, The Koret School of Veterinary Medicine, The Hebrew University of Jerusalem, PO Box 12, Rehovot, 76100, Israel
†Department of Clinical Bacteriology and Mycology, Kimron Veterinary Inst... Israel

Correspondence: Gila Zur, Veterinary Teaching Hospital, The Koret School ... 12, Rehovot 76100, Israel. E-mail: zur.gila@mail.huji.ac.il

Background – Antimicrobial resistance within bacteria ... sumed risk factor for increased rates of resistance is prior...

Objectives – To examine the impact of time since most r... sures and duration of use on antimicrobial resistance rates...

Methods – Inclusion of a case in the study required lab... specimen. Antibiograms and information regarding prior ... cal records of dogs diagnosed with pyoderma or otitis ext...

SMALL ANIMALS/ EXOTIC

Isolation of *Staphylococcus schleiferi* from healthy dogs and dogs with otitis, pyoderma, or both

Elizabeth R. May, DVM, DACVD; Keith A. Hnilica, DVM, MS, DACVD; Linda A. Frank, MS, DVM, DACVD; Rebekah D. Jones, BS; David A. Bemis, PhD

Objective—To determine the frequency of isolation and susceptibility patterns of *Staphylococcus schleiferi* from healthy dogs and dogs with otitis, pyoderma, or both that had or had not received antimicrobial treatment.

Design—Prospective study.

Animals—50 dogs.

Procedure—Dogs were allocated to 1 of 4 groups: healthy dogs (n = 13), dogs without otitis but with pyoderma (10), dogs with otitis but without pyoderma (11), and dogs with otitis and pyoderma (16). Bacteriologic culture of ear swab specimens was performed in all dogs. Bacteriologic culture of skin swab specimens was also performed in dogs with concurrent pyoderma. Isolates were identified as *S schleiferi* subsp *schleiferi* or *S schleiferi* subsp *coagulans* on the basis of growth and biochemical characteristics.

human as well as a veterinary pathogen. Two subspecies were initially identified: a coagulase-negative subspecies, *S schleiferi* subsp *schleiferi*, was isolated from humans in 1988[1] and a coagulase-positive subspecies, *S schleiferi* subsp *coagulans*, was isolated from the external auditory meatus of dogs with otitis externa in 1990.[2] In humans, both subspecies have been associated with wound infections,[3,4] endocarditis,[5,6] osteomyelitis,[3,7] bacteremia,[5] urinary tract infections,[8] and meningitis.[9] In dogs, *S schleiferi* subsp *coagulans* has been associated with pyoderma[10-12] and otitis externa.[2] Holm et al[12] reported that *S schleiferi* subsp *coagulans* was isolated more frequently from dogs with recurrent pyoderma but was also associated with the first episodes of pyoderma; however, the importance of this finding and antimicrobial susceptibility patterns of this subspecies were not addressed. In a recent study,[11] *S schleiferi* subsp *schleiferi* and *S schleiferi* subsp *coagulans*

DOI: 10.5433/1679-0359.2012v33n6p2367

Etiologia, perfil de sensibilidade aos antimicrobianos e aspectos epidemiológicos na otite canina: estudo retrospectivo de 616 casos

Etiology, antimicrobial susceptibility profile and epidemiological aspects in canine otitis: a retrospective study of 616 cases

Verônica Baldim de Oliveira[1]; Márcio Garcia Ribeiro[2*]; Ariani Cristina da Silva Almeida[1]; Antônio Carlos Paes[2]; Larissa Anuska Zeni Condas[3]; Gustavo Henrique Batista Lara[3]; Marília Masello Junqueira Franco[3]; Marta Catarina Fernandes[3]; Fernando José Paganini Listoni[4]

Resumo

Estudo retrospectivo da etiologia, perfil de sensibilidade microbiana, ocorrência de multirresistência dos isolados e os principais aspectos epidemiológicos foram investigados em 616 casos de otite canina. *Staphylococcus* β hemolítico (26,27%), *Malassezia pachydermatis* (12,35%) e *Pseudomonas aeruginosa* (8,8%) foram os micro-organismos mais frequentes. Os isolados foram sensíveis "in vitro" principalmente a norfloxacina (89,62%), gentamicina (83,25%) e ofloxacina (80,16%). Alta ocorrência de resistência das linhagens foi observada frente à neomicina (30,84%) e cefalexina (27,63%). A ocorrência de resistência múltipla a três ou mais e cinco ou mais dos antimicrobianos foi observada em, respectivamente, 34,9% e 15,5% dos isolados. Os casos ocorreram predominantemente nos primeiros anos de idade, em animais sem raça definida, no período do outono. A presença de prurido, mau cheiro e secreção no conduto auditivo foram os principais sinais observados ao exame clínico.
Palavras-chave: Otite, cão, etiologia, sensibilidade microbiana "in vitro", epidemiologia

Abstract

A retrospective study of etiology, antimicrobial susceptibility profile and multiple drug resistance, and major epidemiological aspects were investigated in 616 cases of canine otitis. *Staphylococcus* β hemolitic (26.27%), *Malassezia pachydermatis* (12.35%), and *Pseudomonas aeruginosa* (8.8%) were the most common microorganisms identified. The isolates were susceptible mainly to norfloxacin (89.62%), gentamicin (83.25%), and ofloxacin (80.16%). High occurrence of resistance of isolates was observed to neomicin (30.84%) and cephalexin (27.63%). Multiple drug resistance to three or more and five or more of antimicrobials tested was observed in 34.9% and 15.5% of isolates, respectively. The cases of canine otitis occurred predominantly in first years of age, in mixed breeds animals, at autumn season. The presence of itch, bad smell, and secretion in ear conduct were the major signs observed at clinical examination.
Key words: Otitis, dog, etiology, antimicrobial susceptibility, epidemiology

Tabela 1. Micro-organismos isolados em 616 amostras de exsudato otológico de cães com otite. Botucatu, SP, 2003 a 2009.

Micro-organismos	Número de Isolados	%
Staphylococcus β hemolítico	185	26,27
Malassezia pachydermatis	87	12,35
Pseudomonas aeruginosa	62	8,80
Staphylococcus spp.	30	4,26
Proteus mirabilis	28	3,97
Escherichia coli	18	2,55
Proteus spp.	10	1,42
Staphylococcus α hemolítico	8	1,13
Outros isoladamente[1]	49	6,96
Sub total	477	69,53
Staphylococcus β hemolítico + *M. pachydermatis*	44	6,25
Staphylococcus β hemolítico + *P. aeruginosa*	20	2,84
Streptococcus β hemolítico + *Staphylococcus* β hemolítico	14	1,98
Staphylococcus β hemolítico + *P. aeruginosa*	11	1,56
Proteus mirabilis + *P. aeruginosa*	9	1,27
Streptococcus β hemolítico + *P. aeruginosa*	9	1,27
Staphylococcus spp. + *Staphylococcus* β hemolítico	7	0,99
Outros em associação[2]	95	13,49
Sub total	209	30,47
Total	686	100,0

[1,2]*Proteus vulgaris, Staphylococcus epidermidis, Staphylococcus intermedius, Staphylococcus pseudintermedius, Streptococcus* spp., *Klebsiella* spp., *Morganella morganii, Enterobacter cloacae, Alcaligenes faecalis, Corynebacterium* spp., *Microsporum canis, Staphylococcus aureus. M. pachydermatis = Malassezia pachydermatis; P. aeruginosa = Pseudomonas aeruginosa.*
Fonte: Elaborado pelos autores.

Tabela 2. Perfil de sensibilidade microbiana "in vitro", no teste de difusão com discos, em isolados bacterianos obtidos de casos de otite canina. Botucatu, SP, 2003 a 2009.

Antimicrobianos	Sensível		Parcialmente Sensível		Resistente	
	nº de sensíveis nº de testados (%)		nº de PS nº de testados (%)		nº de resistentes nº de testados (%)	
Cefalexina	515/ 778	(66,19%)	48/778	(6,16%)	215/778	(27,63%)
Ciprofloxacina	562/768	(73,17%)	109/768	(14,19%)	97/768	(12,63%)
Enrofloxacina	526/758	(69,39%)	101/758	(13,32%)	131/758	(17,28%)
Gentamicina	666/800	(83,25%)	32/800	(4%)	102/800	(12,75%)
Neomicina	387/749	(51,66%)	131/749	(17,48%)	231/749	(30,84%)
Norfloxacina	639/713	(89,62%)	55/713	(7,71%)	19/713	(2,66%)
Ofloxacina	598/746	(80,16%)	44/746	(5,89%)	104/746	(13,94%)
Tobramicina	548/738	(74,28%)	44/738	(5,96%)	146/738	(19,78%)

PS = Parcialmente Sensível/ nº = número.

Fonte: Elaborado pelos autores.

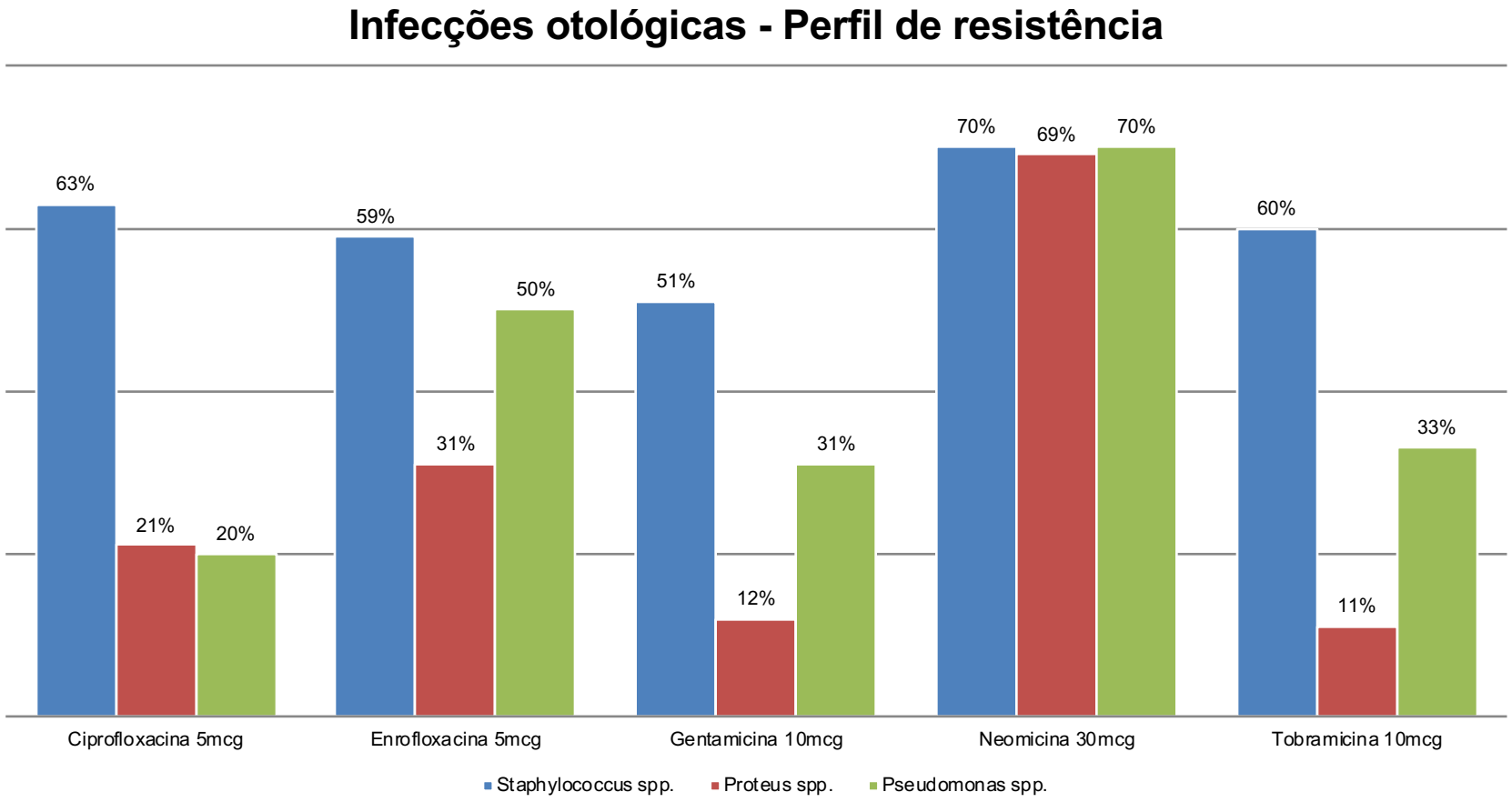
Avaliação da resistência microbiana de infecções clínicas em cães gatos do HOVET-AM

- Raquel Rezende Carvalho - 2015
- pesquisa retrospectiva dos últimos 10 anos

	Agente microbiano	Frequência (n)	Porcentagem (%)
Infecções Otológicas	Staphylococcus spp	60	57%
	Proteus spp.	19	18%
	Pseudomonas spp.	15	14%
	E. coli	5	5%
	Klebsiella spp.	3	3%
	Streptococcus spp.	2	2%
	Bacillus spp.	1	1%
	TOTAL	105	100%

Relação frequencia (n) X porcentagem (%) de aparecimento dos agentes microbianos nas amostras analisadas do Hospital Veterinário Anhembi Morumbi (2004-2014).

Conforme podemos observar na figura abaixo obtivemos uma alta resistência dos agentes antimicrobianos em relação à neomicina [26]. O uso frequente no tratamento da otite tópica e a produção das *β*-lactamases por determinadas cepas de *Staphylococcus* spp., *Proteus* spp. e *Pseudomonas* spp. podem justificar as causas da baixa suscetibilidade [37].



Conclusão:

- As bactérias gram-negativas foram mais suscetíveis à ciprofloxacina, gentamicina e tobramicina semelhante aos dados encontrados em literatura [25-26]
- Em relação ao *Staphylococcus* spp. obtivemos baixa suscetibilidade aos fármacos testados diferente dos dados encontrados em algumas literaturas [26, 34]
- Quanto a alta resistência estafilocócica à enrofloxacina provavelmente seja devido seu uso indiscriminado na clínica de pequenos animais [25]

MULTIRRESISTÊNCIA BACTERIANA IN VITRO DE OTITE EXTERNA DE CÃES

SOUSA, A. B.; CASSEB, L. M. N.; VIEIRA, C.M. A.; MOREIRA, V.M.T.S.; CASSEB, A. R. CONBRAVET, 2008

Tabela 1: Espécies bacterianas e fúngicas isoladas em amostras de secreção auricular de ouvido externo de cães otopatas

Microrganismos	N	Percentual
Cocos Gram positivos		
Streptococcus spp	10	12.20%
Staphylococcus spp	31	37.80%
Total	41	50.00%
Bacilos Gram positivos		
Bacillus spp	06	7.32%
Total	06	7.32%
Enterobactérias		
Klebisiella spp	01	1.22%
Proteus spp	09	10.98%
Esherichia coli	03	3.66%
Total	13	15.85%
Bacilos Gram negativos não fermentadores		
Não identificados	08	9.76%
Pseudomonas aeruginosa	14	17.07%
Total	22	26.83%
Total de bactérias	**82**	86.32%

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Tabela 1: Espécies bacterianas e fúngicas isoladas em amostras de secreção auricular de ouvido externo de cães otopatas

Microrganismos	N	Percentual
Leveduras		
Candida albicans	2	15.38%
Malassezzia pachydermatis	11	84.62%
Total de leveduras	**13**	13.68%
Total geral	**95**	100.00%

N: corresponde ao número de vezes que o microrganismo foi isolado ($p<0.01$)

MULTIRRESISTÊNCIA BACTERIANA IN VITRO DE OTITE EXTERNA DE CÃES

SOUSA, A. B.; CASSEB, L. M. N.; VIEIRA, C.M. A.; MOREIRA, V.M.T.S.; CASSEB, A. R. CONBRAVET, 2008

• gentamicina, norfloxacina, enrofloxacina, amicacina e estreptomicina podem ser utilizados no tratamento das otites externas de cães eficiência de 47.22% a 69.44%

• *Staphylococcus spp*. - susceptibilidade de 90 – 100% - aminoglicosídeos

- Discrepância entre os resultados citológico X cultivo – 18%
- Avaliação do cerume – cocos G+; bastonetes G- e leveduras
- Citologia - 84%
- Cultura - 59%

Danny W. Scott; Williem H. Miller, and Craig E. Griffin: Miller and Kirk's Small Animal Dermatology, Saunders, 6 ed, 2000

Cultivo para o diagnóstico em otite

- SEMPRE ASSOCIAR citologia X cultura (bactérias + céls. Inflamatórias)
- Material do canal horizontal e se houver alteração em ouvido médio também coletar desse local

Successful management of otitis externa

Tim Nuttall

Otitis is one the most common problems seen in dogs. Most acute cases can be managed with topical polyvalent ear preparations. However, these cases frequently evolve into chronic or recurrent otitis that is much harder to resolve. Ongoing cycles of infection and inflammation will lead to chronic pathological changes and select for antimicrobial resistance that make management much more challenging. Diagnosis and management of the

- Identify and manage the primary cause;
- Correct predisposing factors (if possible);
- Remove debris and discharge;
- Manage the secondary infection; and
- Reverse chronic pathological changes.

Isolate 1 : Pseudomonas aeruginosa

Antibiotic	Result	MIC	Reference Range	
Enrofloxacin	Resistant	>=2	0.25 sssR	2
Marbofloxacin	Resistant	>=4	0.5 ssrR	4
Pot Sulphonamide	Resistant	>=320	10 sssrrR	320
Gentamicin	Resistant	>=16	0.5 ssssiR	16
Amikacin	Resistant	>=64	2 ssssiR	64
Ceftazidime	SENSITIVE	<=8	8 Sir	32
Piperacillin	SENSITIVE	<=8	8 Sssrr	256
Carbenicillin	Intermediate	256	16 ssssIr	512
Ticarcillin	SENSITIVE	64	16 ssSrr	256
Tobramycin	SENSITIVE	4	0.5 sssSir	16

Fig 5: Antimicrobial susceptibility results for a multi-drug resistant *Pseudomonas* isolated from a case of otitis externa in a dog. The results appear to indicate that there are only four suitable antimicrobials, but this is only true for systemic treatment. The row of letters in the reference range represent the range of antimicrobial dilutions that the isolate is cultured with (for enrofloxacin this is [right to left] 2.0 µg/ml, 1.0 µg/ml, 0.5 µg/ml, 0.25 µg/ml). The lower case letters refer to the accepted standards and the upper case letters refer to the actual MIC; in this case, the MIC for enrofloxacin is more than or equal to 2.0 µg/ml (the highest tested concentration). The lower case 's' and 'r' ranges show the breakpoint following systemic dosing, 'i' refers to intermediate where the breakpoint is uncertain – in practice regard these as resistant. If the MIC falls within the 'r' range, then it is unlikely that the drug will attain a therapeutic concentration in the target tissue. Treatment is therefore unlikely to be successful and the infection should be regarded as resistant to that antimicrobial. If, however, the MIC falls within the 's' zone, then it is likely that the drug will exceed the therapeutic concentration in the target tissue. Treatment is likely to be successful, and the infection can be regarded as sensitive to that antimicrobial. Note that use of the term infection rather than bacteria; these results do not mean that an antimicrobial cannot eliminate the bacteria, only that systemic treatment would not be effective in that infection. The bacteria may still be eliminated by a sufficiently high concentration, which is why topical therapy is often effective even when in vitro test results show apparent resistance. This is particularly true for concentration-dependent antimicrobials (eg, aminoglycosides and fluoroquinolones), where the efficacy is proportional to the ratio between concentration and MIC

equalis APRESENTA:

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