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LILIANE ROSKAMP

INFLUÊNCIA DA ATOPIA NO PROGNÓSTICO DO REIMPLANTE DE DENTES AVULSIONADOS

CURITIBA

2008

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Dissertação apresentada ao Programa de Pós-Graduação em Odontologia da Pontifícia Universidade Católica do Paraná, como parte dos requisitos para obtenção do título de Mestre em Odontologia. Área de Concentração em Endodontia.

Orientadora: Prof. Dra. Vânia Portela Ditzel Westphalen

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RESUMO

O objetivo deste trabalho foi avaliar a correlação entre evolução de dentes avulsionados e reimplantados e atopia. Foram avaliados 57 dentes avulsionados e tratados endodonticamente na Clínica Odontológica da Pontifícia Universidade Católica do Paraná. O acompanhamento dos dentes reimplantados incluiu exames clínicos e radiográficos periódicos, seguindo as normas de controle da International Association of Dental Traumatology (IADT), 2007. A avaliação de atopia foi baseada em história pessoal e familiar do paciente, juntamente com a realização de teste cutâneo Prick-test para 5 diferentes extratos de alérgenos. Os resultados mostraram que dos 46 dentes com evolução favorável, 33 (71,74%) foram de pacientes atópicos e 13 (28,26%) de não atópicos. Dos 11 dentes com evolução desfavorável, 4 (36,36%) foram de pacientes atópicos e 7 (63,64%) de não atópicos, mostrando que a evolução desfavorável ocorreu em maior prevalência em pacientes não atópicos. A partir dos resultados obtidos, concluiu-se que o prognóstico de 1 ano para dentes avulsionados e reimplantados é mais favorável em pacientes atópicos.

Palavras chave: Avulsão dentária. Reimplante. Reabsorção. Atopia. Prick test

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1.1 INTRODUÇÃO

Um dos mais complexos traumatismos de dentes permanentes é a avulsão dentária, que consiste na saída total do dente do alvéolo. Sua ocorrência varia entre 0,5 a 16% das lesões traumáticas na dentição permanente (1-4).

A conduta mais indicada para este tipo de traumatismo é o reimplante dentário (2,5,6), pois constitui um procedimento conservador, permite a preservação da função estética, protela a necessidade de trabalhos protéticos e reduz o impacto psicológico, decorrente da perda imediata (7).

Quando não for possível o reimplante imediato ou o dente não for mantido em um meio de conservação adequado, o dente pode ser reimplantado, sendo este procedimento considerado reimplante mediato ou tardio (7).

A reabsorção radicular é uma complicação freqüente após o reimplante dentário (2,3,8). Esta patologia pode ser devida à injúria ao ligamento periodontal.

A presença de pré-cemento íntegro e cementoblastos vitais na superfície radicular do dente reimplantado é considerada um fator protetor de reabsorção, devido à manutenção da saúde das células presentes no ligamento periodontal (9-13).

Quando o tecido ósseo fica justaposto à superfície radicular, se estabelece uma anquilose. Em conseqüência da fusão, ocorre a reabsorção por substituição, onde o dente será substituído por tecido ósseo (8).

Outro tipo de reabsorção que pode ocorrer em consequência da avulsão é a inflamatória, que está relacionada com o tecido pulpar infectado (2, 8).

Existem estudos demonstrando a importância da resposta imune inata e adquirida nos mecanismos moleculares e celulares envolvidos na reabsorção de tecido duro (14-21). Foi demonstrado que a importância da resposta adquirida humoral, ou seja, representada por anticorpos na doença periodontal é influenciada pelo balanço da relação entre linfócitos T helper 1(Th1) e T helper 2 (Th2) nas

respostas imunológicas (22, 23). Esta relação ainda não foi avaliada no estudo de dentes avulsionados e reimplantados.

Assim sendo, o objetivo deste estudo foi verificar por meio de Prick-test, se o perfil imunológico de um paciente atópico, ou seja, aquele que é portador de um perfil imunológico tendencioso Th2 poderia estar relacionado à evolução de dentes avulsionados e reimplantados. Além desta análise, avaliou-se também, o sexo, faixa etária, causas da avulsão e os dentes mais afetados.

1.2 MATERIAIS E MÉTODOS

Foram analisados os prontuários de pacientes que tiveram seus dentes avulsionados. Cinquenta e sete dentes avulsionados e reimplantados entre os anos de 2003 e 2006, que seguiam as normas da American Association of Endodontists (AAE), para reimplante dentário, foram selecionados (24).

O consentimento esclarecido foi obtido de todos os pacientes e este estudo recebeu a aprovação do Comite de Ética da Pontifícia Universidade Católica do Paraná (CEP 1406).

Os pacientes foram atendidos inicialmente no Pronto Socorro Odontológico do Hospital Cajuru, e o reimplante dentário foi realizado quando o tempo extra-alveolar fosse inferior a uma hora. Quando este tempo estivesse ultrapassado, os pacientes foram encaminhados para a Clínica Odontológica da Pontifícia Universidade Católica do Paraná, para que se efetuasse o reimplante tardio.

O estudo radiográfico foi realizado comparando-se as radiografias iniciais com as de controle, confeccionadas após um ano de proservação.

As radiografias foram obtidas com filmes periapicais de marca Kodak Insight® (Eastman Kodak Co, Rochester, NY, USA), sensibilidade E/F, tamanho 2 e posicionadores radiográficos da marca JON (São Paulo-SP). Estas foram analisadas em negatoscópio de luz difundida, com auxílio de lupa com aumento de 4x, sendo a área em questão delimitada por intermédio de máscaras de cartolina escura.

As radiografias foram analisadas quanto a presença ou não de imagens sugestivas de alterações radiográficas. Os pacientes foram avaliados clinicamente (19), e então enquadrados em 4 grupos:

Grupo 1: pacientes cujos controles apresentaram evolução favorável, ou seja, dentes assintomáticos, com mobilidade e som normal à percussão, sem evidências radiográficas de reabsorções radiculares ou lesões apicais, com lâmina dura de aparência normal (25) e não atópicos.

Grupo 2: pacientes cujos controles apresentaram evolução desfavorável, ou seja, dentes que apresentaram sintomatologia dolorosa, excessiva mobilidade ou nenhuma devido à anquilose, com som característico na percussão e evidências radiográficas de reabsorção (25) e não atópicos.

Grupo 3: pacientes cujos controles apresentaram com evolução favorável, ou seja, dentes assintomáticos, com mobilidade e som normal à percussão, sem evidências radiográficas de reabsorções radiculares ou lesões apicais, com lâmina dura de aparência normal (25) porém atópicos.

Grupo 4, pacientes cujos controles apresentaram evolução desfavorável, ou seja, dentes que apresentaram sintomatologia dolorosa, excessiva mobilidade ou nenhuma devido à anquilose, com som característico na percussão e evidências radiográficas de reabsorção (25) e atópicos.

Para a avaliação da atopia, os pacientes responderam a um questionário (anexo) com perguntas a respeito de possíveis sinais ou sintomas de atopia pessoal e familiar, e também foi realizado o teste cutâneo para avaliação de atopia, o Prick-test.

Este teste foi selecionado por ser um teste cutâneo primariamente confirmatório para os anticorpos IgE alérgeno-específicos, que são usados para diagnóstico de doenças alérgicas em humanos (26). Como extrato de alérgenos selecionou-se os seguintes: *Dermatophagoides pteronyssinus, Dermatophagoides farinae, Blomia tropicalis, Lollium perene, Fungos III,* Controle positivo representado pela histamina e Controle negativo representado pela solução salina (Laboratório IPI Brasil, São Paulo-Brasil). Estes foram escolhidos para avaliação neste estudo, por serem os alérgenos mais frequentes (27-29).

Técnica do *prick-test*:

Escreveram-se os nomes dos extratos, data, nome e número do prontuário do paciente na pele do seu antebraço.

Colocou-se uma gota de solução salina (controle negativo) a aproximadamente 2 cm do punho, em seguida colocou-se os extratos de *Dermatophagoides pteronyssinus, Dermatophagoides farinae, Blomia tropicalis, Lollium perene, Fungos III*, e por fim a histamina (controle positivo), localizada a 2 cm da dobra do cotovelo.

Deixou-se 2 cm entre cada gota de extrato.

Utilizou-se agulha para insulina G 26,5 – 13 X 4,5 com bisel voltado para cima. Penetrou-se na derme onde estava a gota do extrato, com ângulo de 45 graus e puxou-se levemente a superfície da pele. Após cada procedimento, a agulha foi limpa com gaze, com bisel para baixo. A pele foi limpa 2 minutos depois e esperou-se 15 minutos para a leitura.

O paciente mantinha o braço esticado e descoberto para fazer o teste. A leitura na pele foi feita com espessímetro, traçando-se duas linhas imaginárias nos dois eixos mais longos da pápula, para determinar sua área aproximada e a média ortogonal.

A pápula foi delineada com caneta. Copiaram-se em papel vegetal as leituras e fotografou-se após colocar bolinhas pimaco HB 150 (7,5 mm de raio) de cor vermelha, azul, verde, preta e branca, para melhorar a qualidade fotográfica e medição comparativa das lesões e o valor de pixel, feitas em computador com programa Photo-shop. Mediu-se com espessímetro os dois longos eixos das pápulas e fez-se a média deles, para se obter a área e média ortogonal (distância A_B + C_D /2=media ortogonal). A média ortogonal foi então medida tanto no antebraço do paciente, como no papel vegetal. Quando esta média foi maior que 3 mm, o resultado é positivo para atopia a este determinado alérgeno, e o paciente considerado atópico. Sendo esta média menor que 3 mm, o paciente foi considerado não atópico a este determinado alérgeno.

A análise estatística:

Visando avaliar se existia dependência entre:

a) atopia e reabsorção radicular após reimplante dentário;

b) tempo extra-alveolar e reabsorção radicular;

c) faixa etária e reabsorção radicular;

d) tempo extra-alveolar, atopia e reabsorção radicular, utilizaram-se os testes: Teste Qui-Quadrado e o Teste Exato de Fisher, a um nível de probabilidade $p < 0,05$.

1.3 RESULTADOS

Dos 57 dentes avulsionados e reimplantados seguindo as das normas da American Association of Endodontics (AAE) (24), 18 (31,58%) foram dentes de pacientes do sexo feminino e 39 (68,42%) dentes de pacientes do sexo masculino.

Quanto a faixa etária, 23 (40,35%) dentes corresponderam a pacientes entre 7 e 12 anos; 31(54,38%) dentes em pacientes entre 13 e 18 anos, e 3 (5,26%) em pacientes com idade acima de 19 anos.

As causas mais comuns da avulsão foram queda, 17 (29,82%) dentes, seguidas de 13 (22,8%) de acidente de bicicleta, 10 (17,54%) de acidente de carro, 10 (17,54) de agressão e 7 (12,26%) de batida frontal.

O dente mais afetado foi o incisivo central superior, 43 (75,6%); seguido do incisivo lateral superior, 12 (21%) e 2 (3,5%) caninos superiores.

Dos 57 dentes analisados, 37 (64,09%) foram dentes de pacientes atópicos e 20 (35,91%) não atópicos.

Do total de 57 dentes reimplantados, 46 (80,70%) apresentaram evolução favorável e 11 (19,30%) evolução desfavorável após um ano de controle. Dos 46 dentes com evolução favorável, 33 (71,74%) foram de pacientes atópicos (grupo 3) e 13 (28,26%) de não atópicos (grupo 1). Dos 11 dentes com evolução desfavorável

apenas 4 (36,36%) foram em pacientes atópicos (grupo 4), e 7 (63,64%) em pacientes não atópicos (grupo 2), mostrando que a evolução desfavorável ocorreu em maior prevalência em pacientes não atópicos, conforme tabela 1.

Tabela 1 - relação entre evolução dos dentes reimplantados e atopia.

EVOLUÇÃO	QUANTIDADE	ATOPIA		TOTAL
		presente	ausente	
favorável	número de dentes	33	13	46
	porcentagem	71,74	28,26	100
desfavorável	número de dentes	4	7	11
	porcentagem	36,36	63,64	100
total	número de dentes	37	20	57
	porcentagem	64,91	35,09	100

Fonte: Dados da pesquisa

Os resultados mostraram que para o total de casos com evolução favorável após 1 ano de controle, 31 (67,39%) dentes tiveram tempo extra-alveolar menor que 60 minutos e 15 (33,61%) tempo maior que este período. No entanto, do total de casos com evolução desfavorável, 10 (90,91%) dentes tiveram tempo extra-alveolar maior que 60 minutos e apenas 1 (9,09%) dente este tempo foi menor, conforme tabela 2.

Tabela 2: Relação entre evolução dos dentes reimplantados e tempo extra-alveolar

EVOLUÇÃO	QUANTIDADE	TEMPO EXTRA-ALVEOLAR		TOTAL
		Até 60’	Mais de 60’	
favorável	número de dentes	31	15	46
	porcentagem	67,39	33,61	100
desfavorável	número de dentes	1	10	11
	porcentagem	9,09	90,91	100
total	número de dentes	32	25	57
	porcentagem	56,14	43,86	100

Fonte: Dados da pesquisa.

De acordo com os resultados, do total de dentes com evolução favorável 28 (60,88%) dos casos aconteceram em pacientes entre 13 e 18 anos, 15 (32,60%) em pacientes entre 7 e 12 anos e 3 (6,52%) dentes em pacientes acima de 19 anos. Entretanto, para o total de casos de evolução desfavorável ocorreu o inverso, ou seja, 8 (72,73%) dentes se apresentaram em pacientes na faixa etária entre 7 e 12 anos e 3 (27,27%) dentes em pacientes entre 13 e 18 anos, conforme tabela 3.

Tabela 3: relação entre evolução dos dentes reimplantados e faixa etária

EVOLUÇÃO	QUANTIDADE	FAIXA ETÁRIA			TOTAL
		7 a 12 anos	13 a 18 anos	19 anos ou mais	
favorável	número de dentes	15	28	3	46
	porcentagem	32,60	60,88	6,52	100
desfavorável	número de dentes	8	3	0	11
	porcentagem	72,73	27,27	0	100
total	número de dentes	23	31	3	57
	porcentagem	40,35	54,39	5,26	100

Fonte: Dados da pesquisa.

Quando o tempo extra-alveolar foi menor que 60 minutos e o paciente atópico, 27 (87,1%) dentes apresentaram evolução favorável, e em pacientes não atópicos, 4 (12,9%) dentes. Quando o tempo extra-alveolar foi maior de 60 minutos e o paciente atópico, 6 (40%) dentes tiveram evolução favorável e em pacientes não atópicos, 9 (60%) dentes.

Não houve nenhum caso de evolução desfavorável quando o tempo extra-alveolar foi inferior a 60 minutos e o paciente atópico, e um dente (100%) de paciente não atópico. Ainda, de evolução desfavorável, quando o tempo extra-alveolar foi superior a 60 minutos e paciente atópico, houve 4 (40%) dentes e 6 dentes (60%) de não atópicos, conforme tabela 4.

Tabela 4 - Relação entre evolução dos dentes reimplantados, tempo extra-alveolar e atopia

EVOLUÇÃO	TEMPO EXTRA-ALVEOLAR	QUANTIDADE	ATOPIA		TOTAL
			Presente	Ausente	
favorável	Menor que 60’	número de dentes	27	4	31
		porcentagem	87,1	12,9	100
	Maior que 60’	número de dentes	6	9	15
		porcentagem	40	60	100
desfavorável	Menor que 60’	número de dentes	0	1	1
		porcentagem	0	100	100
	Maior que 60’	número de dentes	4	6	10
		porcentagem	40	60	100

Fonte: Dados da pesquisa.

1.5 DISCUSSÃO

Os critérios para a realização do reimplante dos dentes avulsionados neste estudo foram realizados de acordo com as recomendações da AAE-American Association of Endodontists (anexo) (24). A avaliação dos critérios de evolução favorável ou não dos 57 dentes reimplantados no Pronto Socorro Odontológico do Hospital Cajuru e Clínica Odontológica da PUCPR foi realizada de acordo com a IADT- International Association of Dental traumatology (anexo) (25).

Dos 57 dentes reimplantados, o sexo masculino foi o mais afetado e a faixa etária mais freqüente foi entre 13 e 18 anos de idade.

Quanto às causas, alguns autores (2, 30, 31) afirmaram que a bicicleta é a causa mais freqüente, diferindo deste estudo que foi a queda.

Neste estudo dos 57 dentes reimplantados, 43 foram incisivos superiores, o mesmo foi observado por outros autores (2, 30-32).

Verificou-se também dependência estatisticamente significante entre tempo extra-alveolar e evolução após um ano, uma vez que o Teste Exato de Fisher mostrou valor p< 0,05%. Quando o tempo extra-alveolar foi menor que 60 minutos, dos 32 dentes, 31 tiveram evolução favorável e somente 1 teve evolução desfavorável. Do total de 25 dentes reimplantados com tempo extra-alveolar superior a 60 minutos, 15 tiveram evolução favorável e 10 tiveram evolução desfavorável. Estas observações estão de acordo com outros autores (1-5, 8, 33).

Dos 46 dentes com evolução favorável após um ano de controle, 33 dentes, foram de pacientes atópicos (grupo 3), e 13 de não atópicos (grupo 1). O dente do paciente atópico apresentou maior número de evolução favorável do que o não atópico, estatisticamente significante (p < 0,05).

Os resultados mostraram que dos 11 dentes que apresentaram evolução desfavorável após um ano de controle, apenas 4 dentes ocorreram em pacientes atópicos (grupo 4), e 7 em não atópicos (grupo 2). Estes dados sugerem que o perfil de citocinas presentes no paciente atópico, ativando IL-4, IL-5, IL-6, IL-9 predominantemente, diminuindo o estímulo para aumento do potencial de macrófagos (34-36).

Ao constatar uma tendência a respostas do tipo Th2, ou seja, maior intensidade nas respostas humorais, anti-helmínticas e alérgicas (37), com produção de citocinas IL-4, IL-5 e diferenciação de linfócitos B em plasmócitos com conseqüente produção de anticorpos, principalmente IgE, ocorre a diminuição da produção de citocinas pró-inflamatórias, as quais poderiam ativar ainda mais a efetividade de macrófagos (34-37). Como as células clásticas responsáveis pela reabsorção dentária provêm a partir de células fagocíticas mononucleadas representadas pelos monócitos e macrófagos (2, 38), pode-se supor haver uma diminuição da ativação destas células em um indivíduo atópico, favorecendo, deste modo, prognóstico de reabsorção radicular.

O Teste Qui-quadrado mostrou diferença estatisticamente significante entre faixa etária e evolução (p< 0,05%). Para o total de casos com evolução favorável, 31 dentes ocorreram entre 13 e 18 anos e apenas 23 entre 7 e 12 anos e 3 dentes em pacientes acima de 19 anos de idade. No entanto, do total de casos com evolução

desfavorável, observou-se que 8 dentes ocorreram entre 7 e 12 anos e 3 entre 13 e 18 anos.

Verificou-se também dependência estatisticamente significante entre tempo extra-alveolar, atopia e evolução após um ano, uma vez que o Teste Exato de Fisher mostrou valor p< 0,05%. Quando o tempo extra-alveolar foi menor que 60 minutos e o paciente atópico, 27 dentes apresentaram evolução favorável e para não atópicos, 4 dentes. Não houve nenhum caso de evolução desfavorável para tempo extra-alveolar menor que 60 minutos e dente de paciente portador de atopia, e 1 dente de não atópico nestas mesmas condições. Quando o tempo extra-alveolar foi superior a 60 minutos, também houve menor número de casos desfavoráveis em pacientes atópicos, 4 dentes e 6 dentes de pacientes não atópicos.

De acordo com os resultados deste estudo, pode-se concluir que o paciente atópico apresenta prognóstico mais favorável que o não atópico em dentes avulsionados e reimplantados, nas condições deste experimento. Estes resultados deverão ser confirmados em estudos posteriores.

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2 THE INFLUENCE OF ATOPY IN THE PROGNOSIS OF THE REPLANTATION OF AVULSED TEETH

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Running tittle: Atopy and dental outcome in avulsion and replantation

ABSTRACT

The aim of this study was to evaluate the correlation between the outcome of avulsed and replanted teeth and atopy. Fifty-seven avulsed, endodontically treated teeth were evaluated in the Dentistry Department of the Catholic Pontifical University of Parana. Follow-up of the replanted teeth included periodical clinical and radiographic exams, in accordance with the control rules of the International Association of Dental Traumatology (IADT), 2007. The evaluation of atopy was based on the patient's personal and family history, in conjunction with the skin Prick Test for 5 different allergen extracts. Of the 46 teeth with favorable outcome, 33 (71.74%) were from atopic and 13 (28.26%) non atopic patients. The results showed that in 11 teeth with unfavorable outcome, after one year of control, 4 (33.36%) were of atopic and 7 (63.64%) of non atopic patients, showing that a greater prevalence of unfavorable outcomes occurred in non atopic patients. After one year of clinical and radiographic control, it was concluded that the teeth of atopic patients had a more favorable prognosis as regards dental replantation.

Keywords: Tooth avulsion, atopy, replantation, resorption, Prick-test

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2.1 INTRODUCTION

One of the most complex permanent dental traumatism is tooth avulsion, which consists of the tooth being completely displaced out of its socket. This occurrence accounts for 0.5 to 16% of the traumatic lesions in permanent dentition.[1-4]

The most indicated procedure for this type of traumatism is replantation of the tooth, [2,5,6] as it is a conservative procedure that allows esthetic function to be preserved, defers the need for prosthetic work and reduces the psychological impact resulting from the immediate loss.[7]

When immediate replantation is not possible or the tooth has not been kept in a suitable conservation medium, the tooth can also be replanted. This procedure is considered mediate or late replantation.[7]

Root resorption is a frequent complication after tooth replantation.[2,3,8] This pathology can be due to injury to the periodontal ligament.

The presence of whole pre-cement and vital cementoblasts at the root surface of the replanted tooth is considered a protective factor against resorption, due to maintaining the health of the cells present in the periodontal ligament.[9-13]

When the bone tissue is juxtaposed to the root surface, ankylosis is established. As a result of the fusion, resorption occurs by replacement, in which the tooth will be replaced by bone tissue.[8] Another type of resorption that could occur as a result of avulsion is the inflammatory type, which is related to infected tissue.[2,8]

There are studies that have shown the importance of the innate and acquired immune response in the molecular and cellular mechanisms involved in hard tissue resorption.[14-21] The importance of acquired humoral response has been demonstrated, that is, represented by antibodies in periodontal disease and influenced by the balance in the relationship between the T helper 1 lymphocyte (Th1) and T helper 2 lymphocyte (Th2) in immunological responses.[22, 23] This, however, has not yet been evaluated in the development of root resorptions of avulsed and replanted teeth.

The aim of this study was to verify, by means of the Prick Test, whether or not the immunological profile of an atopic patient, that is, one that has the tendentious Th2 immunological profile, can be related to the outcome of replanted teeth. In addition to this analysis, the sex, age group, causes of avulsion and the most affected teeth were also evaluated.

2.2 MATERIALS AND METHODS

Fifty-seven avulsed and replanted teeth were analyzed between the years 2003 and 2006, in accordance with the guidelines of The American Association of Endodontists (AAE).[24]

The patients were initially attended at the Dental First Aid Service of the Cajuru Hospital, and dental replantation was performed when the extra-alveolar time was under an hour. When this time had been exceeded, patients were referred to the Dental Clinic of the Catholic Pontifical University of Parana, in order to have late replantation performed. A radiographic study was performed by examining the initial radiographs with the control radiographs, taken after one year of follow up.

The radiographs were obtained with periapical films of the Kodak Insight® (Eastman Kodak Co, Rochester, NY, USA) brand, sensitivity E/F, size 2 and radiographic positioners of the JON brand (São Paulo-SP, Brazil). They were analyzed in a difused light negatoscope, with the aid of a loupe with 4x magnification, the area in question being delimited by means of dark cardboard masks.

The radiographs were analyzed as regards the presence or absence of images suggestive of root resorption, and the patients observed clinically, and they were then divided into 4 groups:

Group 1: patients whose controls presented favorable outcome, that is, asymptomatic teeth, with normal mobility and normal percussion sound, without

radiographic evidences of root resorptions or apical lesions, with the lamina dura of normal appearance. Radiograph evidence of arrested or continued root formation and eruption,[25] and non atopic.

Group 2: patients whose controls presented unfavorable outcome, that is, teeth that were symptomatic, excessive or no mobility due to ankylosis, with high-pitched percussion sound and radiographic evidences of resorption,[25] and non atopic.

Group 3: patients whose controls presented favorable outcome, that is, asymptomatic teeth, with normal mobility and sound on percussion, without radiographic evidences of root resorptions or apical lesions, with the lamina dura of normal appearance,[25] but atopic.

Group 4. patients whose controls presented unfavorable outcome, that is, teeth that were symptomatic, excessive or no mobility due to ankylosis, with high-pitched percussion sound and radiographic evidences of resorption,[25] but atopic.

To evaluate atopy, patients answered a questionnaire with questions regarding the possible signs or symptoms of personal and family atopy history, and also the skin Prick Test performed for atopy assessment.

The skin Prick Test was selected because of being a confirmative skin test primarily for allergen-specific IgE antibodies, which are used for diagnosing allergic diseases in humans.[26] As allergen extracts, the following were selected: *Dermatophagoides pteronyssinus, Dermatophagoides farinae, Blomia tropicalis, Lollium perene, Fungi III*, Positive Control (histamin) and Negative Control (saline solution). (Laboratório IPI-ASAC Brasil, São Paulo-SP, Brazil). These were chosen for evaluation in this study because they are the commonest allergens.[27-29]

Prick Test Technique

The names of the extracts, date, patient's name and chart number were written on the skin of the forearm.

A drop of saline solution (negative control) was placed at approximately 2 cm from the wrist; next the extracts of *Dermatophagoides pteronyssinus,*

Dermatophagoides farinae, Blomia tropicalis, Lollium perene, Fungi III were placed, and lastly, the histamin (positive control), located at 2 cm from the elbow fold.

A distance of 2 cm was left between each drop of extract.

An insulin needle G 26.5 – 13 X 4.5 was used with the bevel facing up. Where the drop of extract was, the skin was penetrated at an angle of 45 degrees and the surface of the skin was pulled lightly. After each procedure, the needle was cleaned with gauze, with the bevel facing down. The skin was cleaned 2 minutes later and 15 minutes was waited for reading.

The patient kept his/her arm stretched out and uncovered to do the test. The reading on the skin was taken with a thickness meter, tracing two imaginary lines on the two longest axes of the papula to determine its approximate area and the orthogonal mean.

The papula was delineated with the pen. The readings were copied on vegetable paper, and photographed after placing little balls of pimaco HB 150 (7.5 mm radius) in the colors red, blue, green, black and white, to improve the photographic quality and comparative measurement of the lesions made, on a computer, with the Photo Shop program.

A thickness meter was used to measure the two long axes of the papulas and their mean was calculated in order to obtain the orthogonal area (distance A_B + C_D /2 = orthogonal mean). The orthogonal mean was then measured both on the patient's forearm and on the vegetable paper. When this mean was greater than 3 mm, the result was positive for atopy for this certain allergen, and the patient was considered atopic. If this mean was smaller than 3 mm, the patient was considered non atopic for this certain allergen.

Statistical Analysis:

With the aim of evaluating whether there was dependence between:

a) atopy and root resorption after tooth replantation;

b) extra-alveolar time and root resorption;

c) age group and root resorption;

d) extra-alveolar time, atopy and root resorption, the following tests were used: Chi-Square Test and Fisher's Exact Test, at a level of probability $p < 0.05$.

2.3 RESULTS

Of the 57 avulsed and replanted teeth, in accordance of the American Association of Endodontists (AAE) guidelines,[24] 18 (31.58%) were from female and 39 (68.42%) from male patients.

As regards age group, 23 (40.35%) teeth corresponded to patients between 7 and 12 years of age; 31(54.38%) teeth to those between 13 and 18 years of age, and 3 (5.26%) to individuals over the age of 19 years.

The commonest causes of avulsion were falling, 17 (29.82%) teeth, followed by 13 (22.8%) as a result of bicycle accidents, 10 (17.54%) automobile accidents, 10 (17.54%) assault and 7(12.26%) head-on crash.

The most affected tooth was the maxillary central incisor, 43 (75.6%); followed by the maxillary lateral incisor, 12 (21%) and 2 (3.5%) maxillary canines.

Of the 57 teeth analyzed, 37 (64.91%) were the teeth of atopic patients and 20 (35.09%) of non atopic patients.

Of the total number of teeth replanted, 46 (80.70%) teeth presented favorable outcome, and 11 (19.30%) presented unfavorable outcome after one year of control.

Of the 46 teeth with favorable outcome, 33 (71.74%) were from atopic patients (Group 3) and 13 (28.26%) from non atopic patients (Group 1) according to Table 1.

The results showed that of the 11 teeth with unfavorable outcome, 4 (36.36%) were from atopic patients (Group 4) and 7 (63.64%) from non atopic patients (Group 2), showing that a greater prevalence of unfavorable outcomes occurred in non atopic patients.

The results showed that of the total number of cases with favorable outcome, in 31 (67.39%) teeth, the extra alveolar time was shorter than 60 minutes and in 15 (32.61%) for a longer time than this period. Nevertheless, for the total number of cases with unfavorable outcome, in 10 (90.91%) teeth, the extra alveolar time was longer than 60 minutes and in only 1 (9,09%) this time was shorter, as shown in Table 2.

According to the results, of the total number of cases with favorable outcome, 28 (60.88%) teeth were of individuals between 13 and 18 years, 15 (32.60%) between 7 and 12 years and 3 (6,52%) teeth of patients over the age of 19 years. Nevertheless, for the total number of cases of unfavorable outcome the opposite occurred, that is, 8 (72.73%) teeth were of individuals in the age group between 7 and 12 years and 3 (27.27%) teeth of those between 13 and 18 years of age, according to Table 3.

When the extra-alveolar time was shorter than 60 minutes and the patient atopic, 27 (87.09%) teeth presented favorable outcome, and in non atopic patients, only 4 (12.90%) teeth. When the extra-alveolar time was longer than 60 minutes and the patient atopic, 6 (40%) teeth had favorable outcome, and in non atopic patients, 9 (60%) teeth. There was no unfavorable outcome when the extra-alveolar time was shorter than 60 minutes in atopic patients, and for one tooth (100%) in a non atopic patient. When the extra-alveolar time was longer than 60 minutes, with unfavorable outcome in atopic patients, there were 4 (40%) teeth and in non atopic patients, there were 6 (60%) teeth, as shown in according to Table 4.

2.4 DISCUSSION

The criteria for performing dental replantation of avulsed teeth in this study were performed in accordance with the recommendations of The American Association of Endodontists (AAE).[24] Evaluation of the criteria of whether the outcomes were favorable or not for the 57 teeth replanted at the Dentistry First Aid Service of the Cajuru Hospital and Dental Clinic of PUCPR was performed in accordance with The International Association of Dental Traumatology (IADT).[25]

Of the 57 replanted teeth, male were most affected (68.42%) and the most frequent age group was between 13 and 18 years of age (54.38%).

With regard to the causes, some authors[2,30,31] affirmed that the bicycle is the most frequent cause, differing from this study in which it was falling (29.82%).

In this study, of the 57 replanted teeth, 43 (75.6%) were maxillary incisors. The same was observed by other authors.[2,30-32].

Statistically significant difference was also verified between the extra-alveolar time and outcome after one year, (Fisher's Exact Test, $p< 0.05\%$). When the extra-alveolar time was shorter than 60 minutes, of the 32 (56.14%) teeth, 31(67.39%) presented favorable outcome, and only 1 (9,09%) had an unfavorable outcome. Of the total of 25 (43.86%) teeth replanted, with extra-alveolar time longer than 60 minutes, 15 (32.61%) presented favorable outcome, and 10 (90.01%) had an unfavorable outcome. These results are in agreement with those of others authors.[1-5, 8,33]

The results showed that of the 11 teeth with unfavorable outcome, after one year of control, only 4 (36.36%) were from atopic patients (Group 4) and 7 (63.64%) from non atopic patients (Group 2). This could be suggested by the profile of the cytokines present in the atopic patient, activating predominantly IL-4, IL-5, IL-9, diminishing the stimulus for increasing the potential of macrophages.[34-36]

Of the 46 teeth with favorable outcome after one year of control, 33 (71.74%) teeth were from atopic patients (Group 3) and 13 (28.26%) from non atopic patients

(Group 1). The teeth from the atopic patients presented a higher number of favorable outcomes than those of the non atopic individuals, statistically significant ($p < 0.05$).

When the trend towards responses of the Th2 type is found, that is, greater intensity in humoral, anti-helminthic and allergic immune responses,[37] with the production of cytokines IL-4, IL-5 and differentiation of lymphocytes B into plasmocytes with consequent production of antibodies, mainly IgE, a diminishment occurs in the production of cytokines IL-12 and INF-gamma. This fact could also down regulate the effectiveness of the macrophages even more.[34-37] As the clastic cells responsible for dental resorption come from mononucleated phagocytic cells represented by monocytes and macrophages,[2,38] one could suppose that there would be a diminishment in the activation of these cells in an atopic individual, by the diminishment of cytokines IL-12 and INF-gamma, thus favoring the prognosis of root resorption.

Furthermore, the Chi-square test showed statistically significant difference between the age group and outcome ($p< 0.05\%$). Of the total number of cases with unfavorable outcome, it was observed that 8 (73%) teeth were of individuals in the age group between 7 and 12 years and 3 (27%) teeth of those between 13 and 18 years of age. Nevertheless, for the total number of cases of favorable outcome, 31(61%) teeth were of individuals between 13 and 18 years and only 23 (33%) between 7 and 12 years and 3 (6%) teeth of patients over the age of 19 years.

Statistically significant dependence was also verified between the extra-alveolar time, atopy and outcome after one year since the Fisher's Exact Test showed a value of $p< 0.05\%$. When the extra-alveolar time was shorter than 60 minutes and the patient atopic, 27 (87.10%) teeth presented favorable outcome, and in non-atopic patients, 4 (12.90%) teeth. There was no unfavorable outcome for extra-alveolar time shorter than 60 minutes and the patient atopic, 1 (100%) tooth in a non atopic patient under these same conditions. When the extra-alveolar time was longer than 60 minutes, there was also a lower number of unfavorable cases in atopic patients, 4 (40%) teeth and 6 (60%) teeth in non atopic patients.

According to the results of this study, a correlation between favorable outcome and atopy, could be verified under the conditions of this study. Atopic patients

presented more favorable outcomes. However, more researches must be done relating replantation outcome and patient's immunological profile.

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Tables

Table 1: Relationship between outcome of replanted teeth and atopy.

OUTCOME	QUANTITY	ATOPY		TOTAL
		present	absent	
favorable	Number of teeth	33	13	46
	Percentage	71,74	28,26	100
unfavorable	Number of teeth	4	7	11
	Percentage	36,36	63,64	100
total	Number of teeth	37	20	57
	Percentage	64,91	35,09	100

Table 2: Relationship between outcome of replanted teeth and extra-alveolar time

OUTCOME	QUANTITY	EXTRA-ALVEOLAR TIME		TOTAL
		Less than 60’	More than 60’	
favorable	Number of teeth	31	15	46
	Percentage	67,39	33,61	100
unfavorable	Number of teeth	1	10	11
	Percentage	9,09	90,91	100
total	Number of teeth	32	25	57
	Percentage	56,14	43,86	100

Table 3: Relationship between outcome of replanted teeth and age group

OUTCOME	QUANTITY	AGE GROUP			TOTAL
		7 a 12 years old	13 a 18 years old	19 years old or more	
favorable	Number of teeth	15	28	3	46
	Percentage	32,60	60,88	6,52	100
unfavorablel	Number of teeth	8	3	0	11
	Percentage	72,73	27,27	0	100
total	Number of teeth	23	31	3	57
	Percentage	40,35	54,39	5,26	100

Table 4: Relationship between outcome of replanted teeth and extra-alveolar time and atopy.

OUTCOME	EXTRA-ALVEOLAR TIME	QUANTITY	ATOPY		TOTAL
			Present	Absent	
favorable	Less than 60’	Number of teeth	27	4	31
		Percentage	87,1	12,9	100
	More than 60’	Number of teeth	6	9	15
		Percentage	40	60	100
unfavorable	Less than 60’	Number of teeth	0	1	1
		Percentage	0	100	100
	More than 60’	Number of teeth	4	6	10
		Percentage	40	60	100

.

APÊNDICE A – INSTRUMENTO DE COLETA DE DADOS

História do trauma e reimplante do dente avulsionado

Nome
Telefone
Sexo
Data de nascimento
Idade do paciente
Causa do acidente
Dentes avulsionados
Data do trauma
Hora do trauma
Data do reimplante
Hora do reimplante
Tempo extra-alveolar
Meio de conservação do dente até o reimplante

História endodôntica do dente reimplantado

Datas e procedimentos endodônticos do dente avulsionado
Datas e avaliação clínica e radiográfica do dente avulsionado
Evolução favorável do dente reimplantado? Sim ou não

História alérgica do paciente

Nome
Idade do paciente

Sexo

Profissão

Procedência

Doença alérgica prévia? Qual?

Doença alérgica atual? Qual?

Fatores alérgicos precedentes? Quais?

Alergia a fatores ambientais ? Quais?

Alergia a medicamentos? Quais?

Alergia a alimentos? Quais?

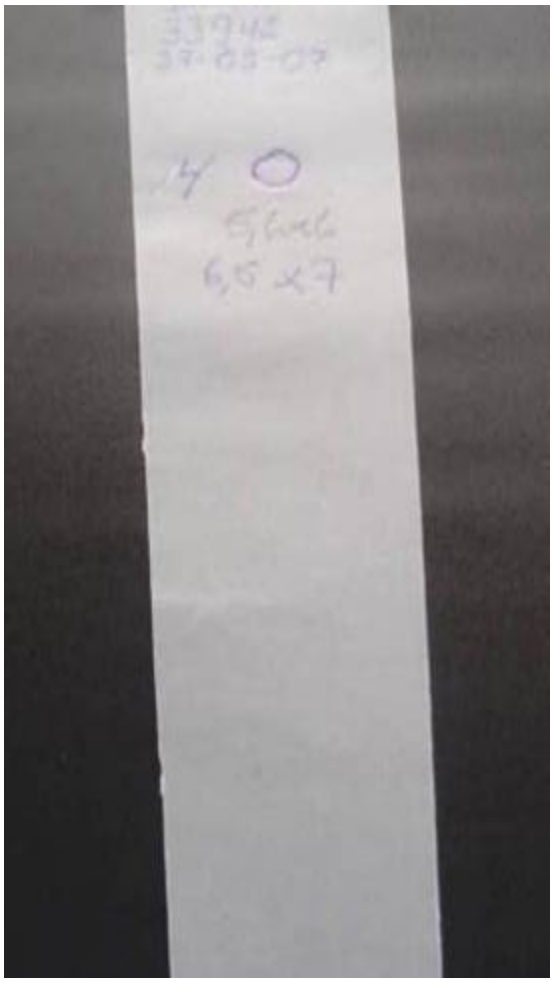
Antecedentes alérgicos de familiares: mãe, pai, irmãos, tios? Sim ou não

Confirmação de atopia pelo Prick Test? Sim ou não

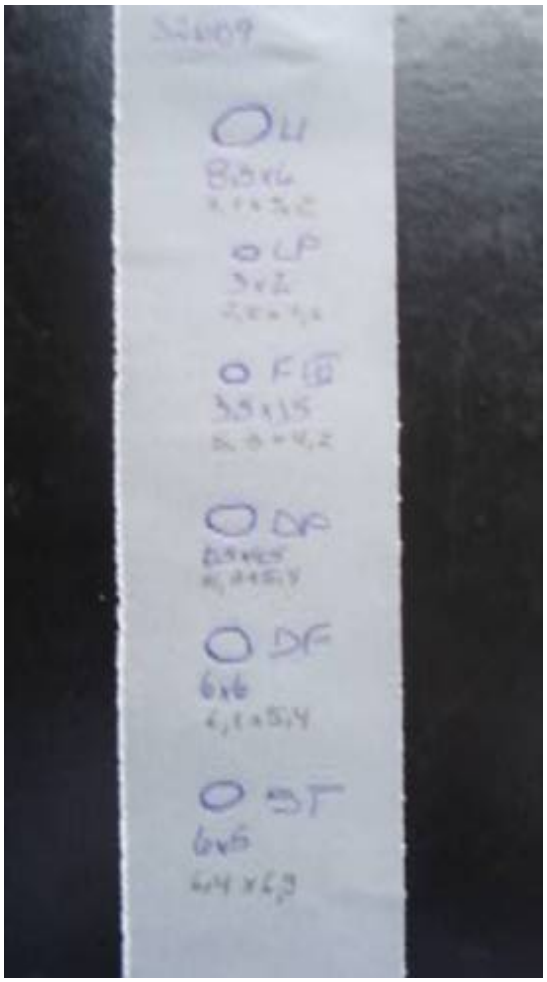
APÊNDICE B - EXEMPLOS FOTOGRÁFICOS DO PRICK-TEST

Resultado negativo na pele

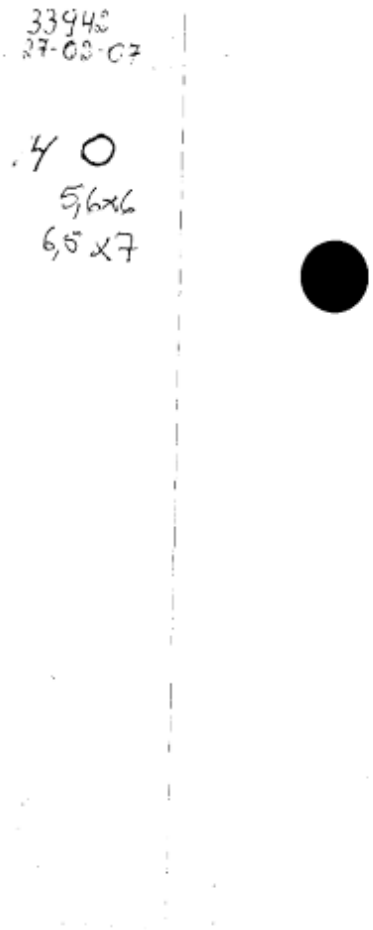
Resultado positivo na pele



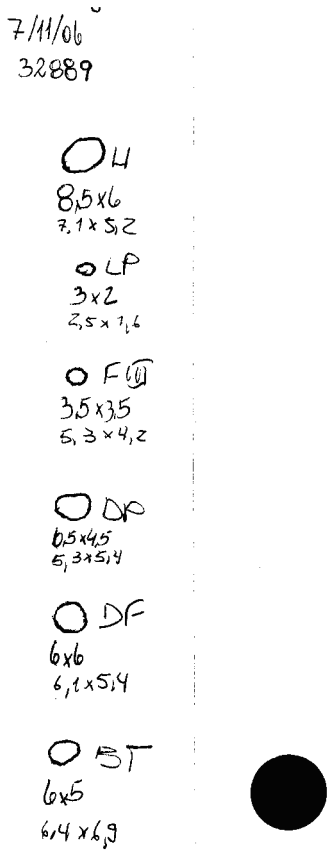
Resultado negativo no papel



Resultado positivo no papel



Resultado negativo escaneado a partir do papel



Resultado positivo escaneado a partir do papel

APÊNDICE C – TABELA DAS MEDIDAS DO PRICK-TEST NA PELE, PAPEL E PIXELS

Prontuário	salina pele	salina		salina pele	salina pele	salina papel	salina		salina papel	salina papel	BT pele	BT pele	BT pele	BT pele res	BT papel	BT papel	BT papel res	D F pele	DF pele	D F pele	DF pele res	Dfpapel	DF papel	Dfpapel	DF papel rs
2-42-76	0	0	0	N	0	0	0	N	15	9	12	P	16	9,5	12,75	P	9	8	8,5	P	11	8,5	9,75	P	
1-67-53	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
2-17-24	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
2-06-97	0	0	0	N	0	0	0	N	0,5	0,5	0,5	N	0	0	0	N	0	0	0	N	0	0	0	N	
1-93-85	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
1-99-43	2	2,5	2,25	N	2	2	2	N	2	2,5	2,25	N	2	2	2	N	2	2,5	2,25	N	2	2	2	N	
3-19-65	0,2	0,3	0,25	N	0	0	0	N	4	4	4	P	4,5	4,5	4,5	P	4	3,5	3,75	P	4	3,5	3,75	P	
2-11-74	0,2	0,3	0,25	N	0	0	0	N	11	7	9	P	11	7	9	P	8	12,5	10,25	P	8	13	10,5	P	
2-18-98	0	0	0	N	0	0	0	N	4	3	3,5	P	3,5	3	3,25	P	1	1,5	1,25	N	1	1	1	N	
2-58-00	0	0	0	N	0	0	0	N	1,5	1	1,25	N	1	1	1	N	2	1	1,5	N	1	1	1	N	
2-79-02	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	6	4,9	5,45	P	6	4,9	5,45	P	
2-66-16	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
2-61-06	0	0	0	N	0	0	0	N	11,5	6,5	9	P	10,5	6,2	8,35	P	14	7	10,5	P	14	7	10,5	P	
2-77-24	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	4	3,5	3,75	P	4	3,5	3,75	P	
3-40-44	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
3-04-88	0	0	0	N	0	0	0	N	6,5	3,9	5,2	P	7	2,5	4,75	P	3,5	3,8	3,65	P	3,5	3	3,25	P	
32491	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
32889	0	0	0	N	0	0	0	N	6	5	5,5	P	6,4	5,9	6,15	P	6	6	6	P	6,1	5,4	5,75	P	
26625	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
26107	0	0	0	N	0	0	0	N	3,5	3	3,25	P	3,6	2,5	3,05	P	2	2	2	N	2,1	2,1	2,1	N	
34023	0	0	0	N	0	0	0	N	8	4	6	P	6,4	4,6	5,5	P	5	4	4,5	P	5,7	5	5,35	P	
24185	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
15827	0	0	0	N	0	0	0	N	8	5,5	6,75	P	7,8	6,6	7,2	P	8	5	6,5	P	7,7	5,2	6,45	P	
25510	0	0	0	N	0	0	0	N	4	3	3,5	P	2,2	2,6	2,4	N	0	0	0	N	0	0	0	N	
30209	0	0	0	N	0	0	0	N	7,5	4	5,75	P	5,5	4,2	4,85	P	6	4,5	5,25	P	6,2	5,6	5,9	P	
29383	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
22864	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
32511	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	5	3	4	P	4	2,2	3,1	P	
24412	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
29763	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
35234	0	0	0	N	0	0	0	N	5,5	3	4,25	P	4	4,3	4,15	P	0	0	0	N	0	0	0	N	
35843	1,5	1,5	1,5	N	2,5	2,2	2,35	N	5	4,5	4,75	P	4,6	4,7	4,65	P	4	4,5	4,25	P	3,6	3,4	3,5	P	
34150	0	0	0	N	0	0	0	N	7	6,3	6,65	P	7	5,6	6,3	P	7,3	3,4	5,35	P	4,5	5	4,75	P	
1984	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
19734	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	4	4,3	4,15	P	5	4	4,5	P	
19108	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
19739	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
20007	0	0	0	N	0	0	0	N	2,8	4	3,4	P	4	4,5	4,25	P	2	2	2	N	3	2	2,5	N	
25691	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
31030	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
19872	0	0	0	N	0	0	0	N	3,8	3,2	3,5	P	6	5	5,5	P	5,4	4,7	5,05	P	7	5	6	P	
23134	0	0	0	N	0	0	0	N	4	4,5	4,25	P	4,5	5	4,75	P	3,6	2,8	3,2	P	3	3	3	P	
particular	0	0	0	N	0	0	0	N	6,6	5,9	6,25	P	5,4	6,2	5,8	P	7,6	5,6	6,6	P	8,1	5,3	6,7	P	
34439	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	2,2	2,6	2,4	N	2	1,5	1,75	N	
21530	0	0	0	N	0	0	0	N	2,8	2,5	2,65	N	2,6	2,4	2,5	N	0	0	0	N	0	0	0	N	
25869	0	0	0	N	0	0	0	N	2,8	2,4	2,6	N	2,1	1,8	1,95	N	3,8	3,1	3,45	P	3,1	2,4	2,75	N	
34845	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
25892	0	0	0	N	0	0	0	N	4	4	4	P	3,6	3	3,3	P	4,9	6,8	5,85	P	3,8	7,4	5,6	P	
22612	0	0	0	N	0	0	0	N	3,1	2,6	2,85	N	3,6	2,9	3,25	P	3,2	2,8	3	P	3,1	3,3	3,2	P	
26974	0	0	0	N	0	0	0	N	5,5	3,4	4,45	P	6,2	3,8	5	P	6,1	6,9	6,5	P	6,1	6,9	6,5	P	
mancio	0	0	0	N	0	0	0	N	8,6	16	12,3	P	9,2	16,5	12,85	P	10	8,4	9,2	P	10,5	8,2	9,35	P	
35328	0	0	0	N	0	0	0	N	9	4,8	6,9	P	10	6,8	8,4	P	7,4	4,1	5,75	P	7,4	6	6,7	P	
34906	0	0	0	N	0	0	0	N	2,5	2,1	2,3	N	2,6	2,2	2,4	N	4	4,1	4,05	P	4,1	4,7	4,4	P	
34565	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
33942	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
34115	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	7	4,9	5,95	P	7,3	4,5	5,9	P	
32816	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	3,4	2,6	3	P	3,8	2,8	3,3	P	
36767	0	0	0	N	0	0	0	N	5,5	3,4	4,45	P	5,1	3,5	4,3	P	3,8	3,9	3,85	P	3,7	3,7	3,7	P	
36761	0	0	0	N	0	0	0	N	7,7	5,2	6,45	P	8,6	6,1	7,35	P	5,8	4,6	5,2	P	5,6	5,4	5,5	P	
35815	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
5964	0	0	0	N	0	0	0	N	4	5,8	4,9	P	4,4	3,9	4,15	P	8,7	4,1	6,4	P	8,9	3,5	6,2	P	
37212	0	0	0	N	0	0	0	N	7,9	5,1	6,5	P	7,3	5,2	6,25	P	5,3	4,2	4,75	P	5,3	4	4,65	P	
28977	0	0	0	N	0	0	0	N	3,5	4,9	4,2	P	5,2	5,8	5,5	P	3,3	4,1	3,7	P	2,2	3,9	3,05	P	
37577	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	
particular	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	

4.3 TABELA DAS MEDIDAS DO PRICK-TEST NA PELE, PAPEL E POEIRA

DP pele	DP pele	DP pele	DP pele result	DP papel	DP papel	DP papel	DP papel result	F pele	F pele	F pele	F pele resul	F papel	F papel	F papel	F papel res	LP pele	LP pele	LP pele	LP pele res	LP papel
14	10	12	P	15	10	12,5	P	6	4	5	P	5	5,5	5,25	P	9	6	7,5	P	11
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	3	3,5	3,25	P	3
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N			0	N	
1	1	1	N	1,5	1	1,25	N	0	0	0	N	0	0	0	N	1,5	1,5	1,5	N	0
1	1	1	N	0,5	0,5	0,5	N	0	0	0	N	0	0	0	N	14	9	11,5	P	14
3	2	2,5	N	2	2	2	N	2	1	1,5	N	2	1,5	1,75	N	11	7	9	P	10
7	5	6,5	P	11	12	11,5	P	5	4	4,5	P	5,5	4	4,75	P	5	5,5	5,25	P	6
21	5	13,5	P	21	5	13,5	P	6	5	5,5	P	6,5	5	5,75	P	11	8	9,5	P	11
3	3	3	P	3	2	2,5	N	5	3,5	4,25	P	5	3	4	P	6,5	4	5,25	P	6
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	3	2	2,5	N	3
6,1	4,5	5,25	P	6	5	5,5	P	0	0	0	N	0	0	0	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
5,8	12	8,9	P	10	6,3	8,15	P	5,5	4	4,75	P	6	3,4	4,7	P	6	4,5	5,25	P	5,4
0	0	0	N	0	0	0	N	4	3	3,5	P	4	3	3,5	P	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
6,9	5,6	6,75	P	7,5	5	6,25	P	0	0	0	N	0	0	0	N	4,4	3,9	4,15	P	4,5
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
6,5	4,5	5,5	P	5,3	5,4	5,35	P	3,5	3,5	3,5	P	5,3	4,2	4,75	P	3	2	2,5	N	1,5
3,5	4,5	4	P	5,5	4	4,8	P	0	0	0	N	0	0	0	N	0	0	0	N	0
3	3	3	P	2	2,5	2,3	N	1,5	1,5	1,5	N	2	2,1	2,05	N	3	3	3	P	2,5
7,5	6	6,75	P	7,5	6,9	7,2	P	6	4	5	P	6,1	5	5,55	P	6,5	5	5,75	P	6,2
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
7	5	6,5	P	6,8	5,3	6,05	P	5,4	4	5,2	P	6,1	4,2	5,15	P	6,5	6	6,25	P	5,5
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
11,5	6	8,75	P	10	5,5	7,75	P	6	5,5	5,75	P	4,4	4,2	4,3	P	3	2,5	2,75	N	3,5
5,4	2,8	4,1	P	5,4	2,8	4,1	P	0	0	0	N	0	0	0	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
4,5	4	4,25	P	4,1	3,1	3,6	P	0	0	0	N	0	0	0	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
5,2	3,5	4,35	P	4	2,7	3,35	P	0	0	0	N	0	0	0	N	0	0	0	N	0
5	5,5	5,25	P	4,7	4,5	4,6	P	3	2,8	2,9	N	2,2	2,5	2,35	N	1	1	1	N	1,9
3,5	3,9	3,75	P	5	6	5,5	P	3,1	2,5	2,8	N	2,5	2	2,25	N	5,9	5,5	5,75	P	5
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
4,5	3,9	4,25	P	5,5	4	5,25	P	0	0	0	N	0	0	0	N	4,1	3,8	3,95	P	5
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
3	2,4	2,7	N	2	2,5	2,25	N	2,5	2,1	2,45	N	3	3	3	P	7,7	7,5	7,6	P	7
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
9,8	5,7	7,75	P	10	6,3	8,15	P	3,7	3,5	3,6	P	4	4	4	P	2,9	2,9	2,9	N	2,5
2,2	2,2	2,2	N	2,2	2,2	2,2	N	0	0	0	N	0	0	0	N	0	0	0	N	0
7,5	7	7,3	P	7,5	6,7	7,15	P	6,5	6,4	6,5	P	7,2	6,4	6,8	P	6,1	5,8	6,95	P	6,5
2,9	2,4	2,65	N	1,5	2	1,75	N	2,9	2,7	2,8	N	2	2	2	N	3,8	2,1	2,95	N	2,2
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
3,1	2,4	2,75	N	2,4	2,3	2,35	N	2,7	1,9	2,3	N	2,9	2,5	2,7	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	3,4	2,6	3	P	2,5
4,9	4,6	4,75	P	3,3	3,6	3,45	P	2,9	2,3	2,6	N	2,4	2,5	2,45	N	2,4	2,5	2,45	N	2,2
3,1	2,3	2,7	N	2,8	3,2	3	P	0	0	0	N	0	0	0	N	0	0	0	N	0
5,4	6,5	5,95	P	5,5	5,9	7,25	P	5,9	6,3	6,1	P	5,5	5,9	5,7	P	5,8	11,5	9,15	P	7,1
5,7	5,5	5,25	P	5,5	7,5	7,05	P	4,5	3	3,75	P	5,4	4,5	4,95	P	8	13	10,5	P	6,5
10,2	5	7,5	P	11	4,5	7,9	P	4,1	4,5	4,35	P	4,5	5,9	5,2	P	4,2	3,3	3,75	P	4,3
4,2	3,9	4,05	P	5,5	4,3	4,95	P	5	4,1	4,55	P	5,1	4,4	4,75	P	5,1	4,9	5,5	P	5,4
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
12	5,4	8,7	P	13	5,7	9,35	P	5,3	5,3	5,3	P	5,3	5,2	5,25	P	3,7	3,3	3,5	P	4,3
0	0	0	N	0	0	0	N	2,6	2,6	2,7	N	2,9	2,5	2,75	N	4,5	2,9	3,7	P	4,5
4,1	3,6	3,85	P	5,2	3,7	4,45	P	0	0	0	N	0	0	0	N	5,4	7,8	7,1	P	5,2
5,7	4,4	5,05	P	4,5	2,6	3,55	P	0	0	0	N	0	0	0	N	0	0	0	N	0
0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0	0	0	N	0
10	5,4	8,2	P	10	5,1	8,05	P	3,3	2,7	3	P	2,9	2,8	2,85	N	2,2	2,9	2,55	N	2,1
5,4	5,5	5,95	P	5,7	5,5	5,15	P	1,3	2	1,65	N	1,2	1,8	1,5	N	4,5	4,4	4,5	P	5
4,2	4,6	4,4	P	4,9	4,2	4,55	P	4,5	3,9	4,2	P	3,3	4,3	3,8	P	3,4	3,8	3,6	P	3,2
0	0	0	N	0	0	0	N	1,6	3,1	2,35	N	2,8	2	2,4	N	3	2,8	2,9	N	2,6
0	0	0	N	0	0	0	N	2	2,1	2,05	N	1,8	2,2	2	N	2,4	2,5	2,45	N	2,2

4.3 TABELA DAS MEDIDAS DO PRICK-TEST NA PELE, PAPEL

LP papel		LP papel	LP papel re	H pele		H pele resu	H pele	H papel	H papel	H papel res	H papel	salina	B tropicalis	D farinae	D Pteronys	Fungos III	Lolium peri	Histamina	circulo	salina	B tropicalis	D farinae	D Pteronys	Fungos III
8	9,5	P		10	11	10,5	P	10	12	11	P	0	6316	3839	6732	895	3641	5003	11206	0	101,0896	61,44444	107,7478	14,32477
3,5	3,25	P		8	8	8	P	9	7	8	P	0	0	0	0	0	299	2496	11009	0	0	0	0	0
0	0	N		14,5	12	13,25	P	15	11	13	P	0	0	0	0	0	0	6419	11009	0	0	0	0	0
0	0	N		9	8	8,5	P	9	7	8	P	30	47	70	40	41	23	2696	11032	0,48016	0,75225	1,120373	0,640213	0,656218
9	11,5	P		12	8	10	P	12	8	10	P	0	0	0	21	0	4973	3844	11032	0	0	0	0,336112	0
7,5	8,75	P		10	10	10	P	10	10,5	10,25	P	93	108	94	65	45	2139	2991	11032	1,488495	1,728575	1,504501	1,040346	0,72024
5,5	5,75	P		8	10	9	P	9,5	8	8,75	P	0	611	368	1344	255	1053	2901	11027	0	9,779253	5,889959	21,51116	4,081368
8	9,5	P		15	12	13,5	P	14	11	12,5	P	18	3285	4045	4330	1167	3961	7357	11206	0,288096	52,57749	64,74154	69,30306	18,67821
5	5,5	P		13	12	12,5	P	13	11	12	P	0	331	19	158	621	892	6135	11009	0	5,297762	0,304101	2,529841	9,939307
2	2,5	N		9	8	8,5	P	8	7	7,5	P	0	12	44	0	0	206	2863	11206	0	0,192064	0,704234	0	0
0	0	N		9,7	8,9	9,3	P	10	9,5	9,75	P	0	0	697	868	0	0	3423		0	0	11,15571	13,89262	0
0	0	N		7,5	7,5	7,5	P	9	6	7,5	P	0	0	0	0	0	0	2364	11027	0	0	0	0	0
5,6	5,5	P		13	12	12,5	P	13	11	12	P	0	2679	4185	2700	615	929	5309	11061	0	42,87926	66,96228	43,21438	9,843275
0	0	N		11	7	9	P	7,9	9,3	8,6	P	0	0	269	0	341	0	3371	10991	0	0	4,305432	0	5,457816
0	0	N		8	6,5	7,25	P	7,8	6,3	7,05	P	0	0	0	0	0	0	2211	10991	0	0	0	0	0
3	3,75	P		7,1	6,5	6,8	P	7,5	6	6,75	P	0	187	294	1366	0	506	1788	11097	0	2,992996	4,705565	21,86327	0
0	0	N		7,1	7,9	7,5	P	8,5	5	6,75	P	0	0	0	0	0	0	1907	11027	0	0	0	0	0
2,5	2,05	N		8,5	6	7,25	P	7,1	5,2	6,15	P	0	958	1394	1364	365	189	2090	11097	0	15,3331	22,31142	21,83126	5,841044
0	0	N		9	7	8	P	7,8	7,4	7,6	P	0	0	0	471	0	0	2740	11097	0	0	0	7,539508	0
3	2,9	N		10	4,1	7,05	P	10	4,1	7,05	P	0	172	105	219	57	355	3237	10997	0	2,752916	1,680659	3,505166	0,912304
5,4	5,8	P		15	6	10,5	P	5,5	14,5	10	P	0	1120	767	1502	864	1225	3019	10967	0	17,92596	12,27608	24,04	13,8286
0	0	N		7	8	7,5	P	7,8	6,8	7,3	P	0	0	0	0	0	0	2068		0	0	0	0	0
5,4	6	P		8	6,5	7,25	P	7	6,9	6,95	P	0	1643	1145	1361	1036	1478	2158	10967	0	26,29675	18,3261	21,78325	16,58152
0	0	N		6,5	5	5,75	P	5,5	5,6	5,55	P	0	305	0	0	0	0	1231		0	4,881624	0	0	0
3,3	3,45	P		7	6	6,5	P	6,8	5,4	6,1	P	0	1095	581	2743	1011	2369	2679	11061	0	17,52583	9,299094	43,90261	16,18198
0	0	N		6,2	5,5	5,85	P	6,2	5,5	5,85	P	0	0	0	566	0	0	1915	10967	0	0	0	9,059014	0
0	0	N		5,5	6	5,75	P	7,8	6,1	6,95	P	0	0	0	0	0	0	1174	10996	0	0	0	0	0
0	0	N		9,5	8	8,75	P	6,8	8,5	7,65	P	0	0	300	572	0	0	3025	11030	0	0	4,801597	9,155046	0
0	0	N		8,5	6,5	7,5	P	8,3	7,6	7,95	P	0	0	0	0	0	0	1940	10996	0	0	0	0	0
0	0	N		8	8	8	P	6,3	7	6,65	P	0	0	0	0	0	0	3080	10996	0	0	0	0	0
0	0	N		10,5	6,5	8,5	P	9,2	8,1	8,65	P	0	626	0	548	0	0	2992	11030	0	10,01933	0	8,770918	0
1,8	1,85	N		11,5	9,5	10	P	10,4	7,3	8,85	P	76	772	439	938	206	28	4821	11030	1,216405	12,35611	7,026338	15,01299	3,297097
5,5	5,75	P		6	5,5	5,75	P	7	6,5	6,75	P	0	1129	527	538	342	1164	1692	11061	0	18,07001	8,434806	8,610865	5,473921
0	0	N		8,5	8,6	8,55	P	10	7	8,5	P	0	0	0	0	0	0	3061	10995	0	0	0	0	0
4	5	P		10	10	10	P	12	12	12	P	0	0	656	783	0	1005	5733		0	0	10,49949	12,53217	0
0	0	N		7,8	7,9	7,85	P	8	10	9	P	0	0	0	0	0	0	2349	10984	0	0	0	0	0
0	0	N		6,1	6,1	6,1	P	7	8	7,5	P	0	0	0	0	0	0	2130	10984	0	0	0	0	0
7	7	P		6,4	6,8	6,6	P	8	9	8,5	P	0	351	162	205	177	2125	3039	11137	0	5,617869	2,592863	3,281092	2,832042
0	0	N		7,7	6,5	7,1	P	9	6	7,5	P	0	0	0	0	0	0	1856	10984	0	0	0	0	0
0	0	N		7,5	7,3	7,4	P	7	8	7,5	P	0	0	0	0	0	0	2040	10995	0	0	0	0	0
2,5	2,5	N		10	8	9	P	11	10	10,5	P	0	1147	1432	2009	479	117	3964	10959	0	18,35811	22,91062	32,1547	7,666551
0	0	N		5,9	6,3	6,1	P	7	6	6,5	P	0	669	320	164	0	0	1465		0	10,70756	5,121704	2,624873	0
7	7,8	P		8,9	7,2	8,05	P	9	6,7	7,85	P	0	1052	1338	1768	1720	1831	1999	10934	0	16,8376	21,41512	28,29741	27,53216
2,1	2,15	N		6,4	6,2	6,3	P	7	7	7	P	0	0	125	178	95	96	1936		0	0	2,000666	2,848948	1,520506
0	0	N		8,9	8	8,45	P	9,4	8,1	8,75	P	0	208	0	0	0	0	2890	10995	0	3,329108	0	0	0
0	0	N		7,8	6	6,9	P	8,4	5,7	7,05	P	0	109	167	92	110	0	1800	10992	0	1,74459	2,672889	1,312437	1,760586
2,8	2,65	N		5,5	5	5,25	P	7,8	5	6,4	P	0	0	0	0	0	79	1300	10992	0	0	0	0	0
2	2,1	N		9,2	7,1	8,15	P	9,1	6,6	7,85	P	0	93	578	123	21	125	2576	10993	0	1,488495	9,251078	1,969655	0,336112
0	0	N		6,8	5,3	6,05	P	7,4	5,7	6,55	P	0	209	322	166	0	0	1823	10992	0	3,345113	5,153715	2,656894	0
11,5	9,3	P		9,2	6,3	7,75	P	10	7	8,5	P	0	757	1577	2092	945	4560	2865		0	12,11603	25,2404	33,32309	15,12503
13	10,8	P		8,6	9	8,8	P	8,5	8,7	8,6	P	0	6444	3163	1777	496	3601	2995		0	103,1383	50,62484	28,44146	7,938641
3,2	3,75	P		7,2	8,1	7,65	P	6,5	9,1	7,8	P	0	2131	1410	2397	621	270	2020		0	34,10735	22,56751	38,36476	9,939307
3,7	4,55	P		9,9	12,5	11,2	P	10	14	12	P	0	65	559	732	633	876	5928	11070	0	1,040346	8,946077	11,7159	10,13197
0	0	N		11	9,3	10,15	P	12	9,1	10,55	P	0	0	0	0	0	0	4268	10960	0	0	0	0	0
0	0	N		5,6	6	5,8	P	6,5	7	6,75	P	0	0	0	0	0	0	1512	10960	0	0	0	0	0
3,6	3,95	P		10	8,5	9,25	P	10,5	8,7	9,6	P	0	0	1111	2400	672	440	4099	11070	0	0	17,78192	38,41278	13,95664
3	3,75	P		9,6	6,1	7,85	P	10	6,6	8,3	P	0	0	128	0	109	125	2103	10934	0	0	2,048662	0	1,74458
7,3	6,75	P		10	9,1	9,55	P	10	8,6	9,3	P	0	475	480	540	0	1688	3198	10934	0	7,602529	7,682556	8,642875	0
0	0	N		9,1	9,3	9,2	P	9,2	8,6	8,9	P	0	1468	1095	391	0	0	3462	11282	0	23,49582	17,36578	6,099029	0
0	0	N		5,3	5,9	5,6	P	5,8	6	5,9	P	0	0	0	0	0	0	1108	10960	0	0	0	0	0
2,6	2,35	N		7,5	6	6,75	P	7,4	6	6,7	P	0	448	884	2212	132	280	1558	11070	0	7,170385	14,14871	35,40378	2,112703
4,4	4,7	P		6,9	5,2	6,05	P	9,9	5,1	7,5	P	0	1271	741	1003	141	839	1150	11282	0	20,34277	11,85096	16,05394	2,256751
4,3	3,75	P		7,6	7,8	7,7	P	7,4	7	7,2	P	0	607	338	659	231	315	2108	11282	0	9,715232	5,4098	10,54751	3,69723
2,8	2,8	N		8,6	6	7,3	P	9	5,9	7,45	P	0	0	0	0	104	153	1925	11044	0	0	0	0	1,664554
2,5	2,35	N		6,8	6,9	6,85	P	6,7	7	6,85	P	0	0	0	0	21	63	1410	11044	0	0	0	0	0,336112
												0	0	0	0	0	0	0						
												0	0	0	0	0	0	0	11035,39	0	0	0	0	0

4.3 TABELA DAS MEDIDAS DO PRICK-TEST NA PELE, PAPEL

Lollium perr	Histamina	circulo		salina resul	B tropicalis	D farinae r	D Pteronys	Fungos III r	Lollium perr	Histamina r	circulo resu	Atopia A/N	B tropicalis	[illegible]	[illegible]	D Pteronys	Fungos III r	Lollium perr	Histamina r	circulo result	Atopia A/N
58,27539	80,07464	179,3557	N	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	A	
4,785592	39,04929	176,2026	N	N	N	N	N	N	P	N	N	N	N	N	N	?	P	N	N		
0	10,27382	176,2026	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0,368122	43,15036	176,5707	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
79,59448	61,52447	176,5707	N	N	N	N	N	P	P	P	A	N	N	N	N	P	P	P	A		
34,23539	47,87193	176,5707	N	N	N	N	N	P	P	P	A	N	N	N	N	P	P	P	A		
16,85361	46,43145	176,4907	N	P	N	P	N	P	P	P	A	P	N	P	?	P	P	P	A		
63,39709	117,7512	179,3557	N	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A		
14,27675	99,19267	176,2026	N	N	N	N	P	P	P	P	A	?	N	?	P	P	P	P	A		
3,297037	45,82324	179,3557	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	54,78623	0	N	N	P	P	N	N	P	N	A	N	P	P	N	N	P	N	A		
0	37,83659	176,4907	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
14,86825	84,07227	177,0349	N	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A		
0	53,05395	175,9145	N	N	N	N	N	N	P	P	N	N	?	N	?	N	P	P	N		
0	35,28777	175,9145	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
8,099604	29,61752	177,6111	N	N	N	P	N	P	P	P	A	?	?	P	N	P	P	P	A		
0	30,52215	176,4907	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
3,025006	33,45113	177,6111	N	P	P	P	N	N	P	P	A	P	P	P	?	N	P	P	A		
0	43,85459	177,6111	N	N	N	P	N	N	P	P	A	N	N	P	N	N	P	P	A		
5,69189	51,80924	176,0106	N	N	N	N	N	N	P	P	N	?	N	?	N	?	P	P	N		
19,60652	48,32008	175,5304	N	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A		
0	33,09901	0	N	N	N	N	N	N	P	N	N	N	N	N	N	N	P	N	N		
23,65587	34,53949	175,5304	N	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A		
0	19,70255	0	N	N	N	N	N	N	P	N	N	?	N	N	N	N	P	N	N		
37,91661	42,87826	177,0349	N	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A		
0	30,6502	175,5304	N	N	N	P	N	N	P	P	A	N	N	P	N	N	P	P	A		
0	19,79025	175,9946	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	48,41611	176,5387	N	N	N	P	N	N	P	P	A	N	?	P	N	N	P	P	A		
0	31,05033	175,9946	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	49,2964	175,9946	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	47,88793	176,5387	N	P	N	P	N	N	P	P	A	P	N	P	N	N	P	P	A		
0,449149	77,16167	176,5387	N	P	N	P	N	N	P	P	A	P	?	P	?	N	P	P	A		
18,6302	27,08101	177,0349	N	P	P	P	N	P	P	P	A	P	P	P	N	P	P	P	A		
0	48,9923	175,9785	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
16,09535	91,75853	0	N	N	P	P	N	P	P	N	A	N	P	P	N	P	P	N	A		
0	37,59651	175,8025	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	34,09134	175,8025	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
34,01131	48,64018	178,2513	N	N	N	N	N	P	P	P	N	?	N	N	?	P	P	P	A		
0	29,70598	175,8025	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	32,65096	175,9785	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
1,872623	63,44511	175,4024	N	P	P	P	P	N	P	P	A	P	P	P	P	N	P	P	A		
0	23,4478	0	N	P	N	N	N	N	P	N	A	P	?	N	N	N	P	N	A		
29,30575	31,09464	175,0022	N	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A		
1,536511	30,98631	0	N	N	N	N	N	N	P	N	N	N	N	N	N	N	P	N	N		
0	46,25539	175,9785	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	29,80958	175,9305	N	N	N	N	N	N	P	P	N	N	?	N	N	N	P	P	N		
1,264421	20,80692	175,9305	N	N	N	N	N	N	P	P	N	N	N	N	N	?	P	P	N		
2,000666	41,22972	174,9862	N	N	P	N	N	N	P	P	A	?	P	?	N	N	P	P	A		
0	29,17771	175,9305	N	N	N	N	N	N	P	P	N	?	?	?	N	N	P	P	N		
72,99428	45,85526	0	N	P	P	P	P	P	P	N	A	P	P	P	P	P	P	N	A		
57,63517	47,09595	0	N	P	P	P	P	P	P	N	A	P	P	P	P	P	P	N	A		
4,321438	32,33076	0	N	P	P	P	P	N	P	N	A	P	P	P	P	?	P	N	A		
14,02066	94,87956	177,1789	N	N	P	P	P	P	P	P	A	N	P	P	P	P	P	P	A		
0	68,31073	175,4184	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	24,20005	175,4184	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
7,042343	65,60593	177,1789	N	N	P	P	P	N	P	P	A	N	P	P	P	?	P	P	A		
2,000666	33,6592	175,0022	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
27,01609	51,18503	175,0022	N	P	P	P	N	P	P	P	A	P	P	P	N	P	P	P	A		
0	55,41043	180,5721	N	P	P	N	N	N	P	P	A	P	P	?	N	N	P	P	A		
0	17,7339	175,4184	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
4,481401	24,0383	177,1789	N	P	P	P	N	N	P	P	A	P	P	P	N	N	P	P	A		
13,42847	19,40612	180,252	N	P	P	P	N	P	P	P	A	P	P	P	N	P	P	P	A		
5,041677	33,73922	180,252	N	P	N	P	N	N	P	P	A	P	?	P	?	?	P	P	A		
2,449815	30,81025	176,7628	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
1,009335	22,56751	176,7628	N	N	N	N	N	N	P	P	N	N	N	N	N	N	P	P	N		
0	0	176,625	N	N		N	N	N	N	P	N	N		N	N	N	N	P	N		

APÊNDICE D – REVISÃO DE LITERATURA

As situações de urgência provocadas por traumatismo envolvendo a boca e os dentes quase sempre se transformam em experiências dramáticas para as crianças afetadas, familiares e socorristas. As estatísticas mostram que aproximadamente 14% das crianças e adolescentes passam de alguma forma, por estas situações (1).

Um dos mais complicados e controversos traumatismos de dentes permanentes é a avulsão, que consiste na saída do dente para fora do alvéolo, e cuja incidência varia entre 0,5 a 16% das lesões traumáticas (2-4).

A maioria dos dentes avulsionados ocorre em crianças e adolescentes (5), principalmente nos incisivos superiores (3,6-9). Nesta idade a condição do ligamento periodontal do dente em erupção ou recém irrompido e a elasticidade do osso alveolar favorecem a avulsão (10). O reimplante do dente avulsionado é a melhor solução estética e funcional, se manipulado corretamente. Além disto, evita traumas psicológicos pela perda precoce do dente mantém o espaço e retarda a resolução protética (11).

As causas estão invariavelmente relacionadas à prática de esportes, como futebol, ciclismo, skate, entre outras. Os acidentes ocorrem principalmente na escola durante o período de recreação ou no tempo livre da criança, na rua ou em casa (3,5).

O sucesso do tratamento do reimplante dentário consiste na permanência do dente avulsionado e reimplantado em seu respectivo alvéolo pelo maior período de tempo possível(3,12-16). Está relacionado com o tempo que se leva para reimplantá-lo, ou seja, tempo extra-alveolar, além do seu manejo, técnica de reimplante, meio de transporte do dente, tratamento de superfície radicular e endodôntico, contenção, uso de medicação sistêmica e proservação (3,13-19).

No entanto, fundamental é a consciência de que o tempo de um dente avulsionado fora do alvéolo é inversamente proporcional à possibilidade de sucesso (10). Apesar das evidências indicarem que o reimplante dentário deve ser realizado nos primeiros 5 minutos para que haja a regeneração do ligamento periodontal e o retorno de funções normais do dente (10), isto normalmente não ocorre devido à falta de treinamento das pessoas que socorrem, relutância em causar mais dor ou medo na criança, ou a colocação incorreta do dente no alvéolo (20). Daí a necessidade de educação e conscientização da população por meio de campanhas educativas sobre os procedimentos de emergência a serem realizados (18,19).

A presença de pré-cemento íntegro e cementoblastos vitais na superfície radicular do dente reimplantado é considerada um fator protetor de reabsorção, devido a manutenção da saúde das células presentes no ligamento periodontal (21-25). Assim sendo, recentemente tem se dado atenção ao fato que o dente avulsionado fica freqüentemente exposto ao meio externo e é muitas vezes manipulado inadequadamente, envolto em papel ou tecido até o seu reimplante. Estudos demonstraram que após a estocagem do dente em meio seco por mais de 15 minutos, as células precursoras existentes no ligamento periodontal ficam incapazes de dividir-se e diferenciar-se em fibroblastos. Após 30 minutos em meio seco, as células do ligamento necrosam (26-30).

As células do ligamento que são adequadamente estocadas podem manter sua vitalidade por períodos prolongados, porém perdem a sua capacidade de se diferenciar em fibroblastos e desempenhar as funções normais das células do ligamento periodontal. Além disso, as células do ligamento presas ao osso alveolar sofrem também ruptura pela avulsão, tendo assim sua capacidade de contribuir para a regeneração do novo ligamento diminuída (30). A destruição do micro ambiente e a falha na sua reconstituição parecem ser razões significativas para haver o reparo e não a regeneração após a injúria (22).

Existem poucos estudos dos mecanismos moleculares e imunológicos envolvidos na reabsorção dentária após o traumatismo (31).

O mecanismo de regeneração após o reimplante de um dente avulsionado ainda não está bem compreendido. Acredita-se, no entanto, que a reabsorção parcial ou total da raiz dentária também está associada com anormalidades ósseas que produzem um local atípico para a regeneração normal (31). No entanto, o fator de crescimento de fibroblastos (bFGF, FGF-2) facilita a cura e a regeneração do ligamento periodontal em defeitos ósseos alveolares experimentais, sendo um instrumento terapêutico viável (32).

Existe um mecanismo celular comum na reabsorção dos tecidos mineralizados como osso e dente (33). As células mais importantes envolvidas na fase de reabsorção propriamente dita são os osteoblastos, que são as células responsáveis pela formação óssea e os cementoblastos, que formam o cemento. As células reabsortivas são os osteoclastos, cementoclastos e odontoclastos, que serão chamados genericamente de clastos, devido às similaridades encontradas nestas células (5,33,34).

A dentina possui um potencial para alterar as funções celulares no micro-ambiente dente-ligamento periodontal, porém os mecanismos de ação permanecem ainda pouco compreendidos, especialmente como estas células interagem com o tecido dentário e se a liberação de moléculas dentinárias contribui para a manutenção da reabsorção ou indução do reparo durante a exposição patológica (35-40). Outro fator a ser considerado é a importância das bactérias ou moléculas moduladoras do processo de reabsorção e aposição óssea presentes no ligamento periodontal, que poderiam ou não alterar o curso da doença (41). Alguns pontos a este respeito devem ser levados em conta: qual o tipo de células ativadas no processo, qual a natureza de seus receptores e finalmente se existe ação direta ou dependente de fatores que modulem a cinemática óssea como citocinas, fatores de crescimento, hormônios ou outros componentes extracelulares (42). Foi determinado que os constituintes dentários têm um papel ativo na reabsorção radicular, induzindo respostas imunológicas específicas e não específicas. Ocorre a tentativa de contenção do antígeno, mas por outro lado, ocorre a destruição do tecido duro pela própria reação inflamatória (35).

Atualmente já não mais se discute a participação do sistema imunológico nos processos de reabsorção de tecido ósseo. Já foi demonstrada a participação da resposta imune inata, por meio da comprovação da presença de diversas citocinas desta fase, como a interleucina 1 (IL1) e fator de necrose tumoral (TNF) no ligamento periodontal (43). Foi demonstrada também, a atuação de componentes desta resposta em perfil imunológico Th1 (linfócito T helper 1) na doença periodontal (44-47) e a importância das citocinas de perfil Th1 e Th2 (linfócito T helper 2) na homeostase do osso alveolar (48). Entretanto, poucas informações específicas sobre a atuação da resposta imune adquirida na reabsorção dentária que ocorre quando um dente é avulsionado e reimplantado são encontradas na literatura.

Eventos que ocorrem no alvéolo quando um dente é avulsionado e reimplantado

Primeiramente ocorrerá o rompimento de vasos, do ligamento periodontal e morte celular. Neste momento, bactérias e outros microrganismos existentes na boca penetram no alvéolo, iniciando a cascata de coagulação, com a clivagem do fator de Hagman, por meio do contacto de bactéria gram-negativas. O Fator de Hagman clivado pode agir sobre o cininogênio de alto peso molecular e Fator XI e este ativado, participa da Cascata de Coagulação. A quebra do cininogênio de alto peso molecular leva à formação da bradicinina, que aumenta a permeabilidade vascular e à degranulação de mastócitos, à produção da fosfolipase A, entre outras atividades. A vaso-dilatação causada e o aumento da permeabilidade vascular levam à saída de proteínas e líquido plasmático do vaso sanguíneo levando ao aumento da viscosidade sanguínea e conseqüente redução na velocidade do fluxo sanguíneo. Ocorre então uma inversão das correntes celulares e os leucócitos passam a ocupar uma posição mais periférica dentro do vaso com conseqüente saída de células leucocitárias pelas junções endoteliais (diapedese) para o meio intersticial (49).

Aproximadamente duas horas após, os neutrófilos, que são mais ágeis e mais numerosos, chegam ao local, atraídos pelo exsudato. Eles são encontrados nas primeiras 24 a 72 horas. Após 8 a 12 horas da agressão ocorre a chegada dos macrófagos. Ao contrário dos neutrófilos, os macrófagos têm vida mais longa e várias funções, entre elas: fagocitar grandes e pequenas partículas, produzir substâncias para o meio extracelular como as citocinas, fatores de crescimento, produtos do ácido araquidônico, além de outros mediadores químicos. Entra em ação o Sistema complemento, que constitui um complexo molecular que atua de forma complementar aos anticorpos, daí sua denominação. A Via Clássica do complemento é desencadeada por imunoglobulinas, enquanto que a Via Alternativa é ativada por microrganismos. Ambas culminam na destruição do microorganismo pelo rompimento de sua membrana celular por um complexo molecular chamado de Complexo de Ataque à Membrana (MAC). Durante estas duas vias, ocorre a produção de subprodutos capazes também de induzir a reação inflamatória, como o

C3a e o C5a, que induzem a ativação dos mastócitos e atração de neutrófilos para o local. A histamina é um dos principais produtos gerados neste processo da fase imediata e é o mantenedor da vaso-dilatação (49).

Este mesmo processo, após seis horas, vai ser responsável pela produção de prostaglandinas, leucotrienos, citocinas como IL4, da fase tardia da inflamação. As citocinas são seqüências de aminoácidos capazes de interar-se com receptores específicos de membranas celulares. As principais citocinas da resposta imune imediata são a interleucina-1 (IL1) e o fator de necrose tumoral (TNF). Os fatores de crescimento, que são um subgrupo das citocinas, atuam na diferenciação e ou proliferação celular e na produção específica de algum produto celular. O estresse celular também aumenta a permeabilidade celular ao cálcio, o que estimula a fosfolipase A2 ou C, mobilizando o ácido araquidônico das membranas celulares, o qual sofre ação das cicloxigenases ou lipoxigenases, gerando as prostaglandinas e os leucotrienos, respectivamente (ciclo metabólico do ácido araquidônico) (50).

O exsudato formado no local é então composto por fibrinas, plasminas, cininas, imunoglobulinas, fatores do complemento, prostaglandinas, leucotrienos, citocinas e fatores de crescimento, originados de células teciduais locais em condições de estresse, além do aumento do infiltrado tissular por leucócitos, perda das fibras colágenas perivasculares e proliferação do epitélio juncional (45-47). Durante os estágios iniciais, o infiltrado inflamatório de células T é predominante, enquanto que na lesão estabelecida, as células B se tornam mais comuns. Estas mudanças significam uma alteração local dos eventos imunoreguladores do hospedeiro (51). O curso da reabsorção dentária depende de uma complexa interação entre as células ósseas, dentárias e inflamatórias dos tecidos adjacentes. Os extratos dentinários desencadeiam uma migração leucocitária *in vivo* em tempo e dose dependentes e *in vitro*, a síntese de ácido nítrico (NO), TNF-alfa e IL1 pelos macrófagos. O fator de crescimento tumoral-beta (TGF- β) facilita a adesão leucocitária às paredes dos vasos e à Matriz Extra-Celular (ECM) nos sítios inflamatórios, por aumento da expressão de integrinas (35).

Os clastos se instalam. Os osteoblastos e cementoblastos possuem receptores específicos para os mediadores da inflamação, recebendo estímulos via

citocinas, fatores de crescimento e produtos do ácido araquidônico, e liberando fatores solúveis direcionados para os clastos. Também expõem em suas membranas plasmáticas os receptores que ativarão pré-clastos e osteoclastos maduros, mediando desta forma e localmente o trabalho de reabsorção de tecido dentário e ósseo, quando o dente for reimplantado (34).

Expressos na superfície da membrana celular destes vários tipos de células encontram-se receptores que promoverão o contacto célula a célula indispensável para a ativação e desativação dos clastos. São chamados de RANK (receptor ativador de NF-kB), RANKL (receptor ativador de NF-kB ligante), OPG (osteoprotegerina) os quais possuem efeitos reguladores no metabolismo dos tecidos duros (21,23,51-57). O receptor RANK está expresso em altos níveis em precursores osteoclásticos e em osteoclastos e cementoclastos, e é exigido para a ativação e diferenciação dos osteoclastos. O seu ligante, o RANKL, que é uma proteína transmembrana expressa em vários tipos celulares, especialmente em osteoblastos e células T ativadas, força a célula a interagir fisicamente com os precursores dos osteoclastos e cementoclastos e se liga ao seu receptor RANK para induzir a reabsorção de tecido duro. O RANKL pode ser clivado e sua forma solúvel é ativa, sendo também considerado um efetor direto nas funções osteoclásticas. A OPG, expresso por osteoblastos, cementoblastos inibe a reabsorção de osso ou dente se ligando com grande afinidade ao seu ligante RANKL, prevenindo assim que este se ligue ao seu receptor RANK. O sistema é regulado por proteínas, citocinas e hormônios calciotrópicos e parece ter importância na modulação do sistema imunológico. Células apresentando RNA mensageiro (mRNA) para RANKL com estímulo de citocinas como IL1-β, TNF-α, IL17, promovem inflamação e reabsorção. OPG, IL4, IL10 e CTLA-4 inibem a inflamação e a osteoclastogênese (58,59).

Além destes fatores, deve-se considerar que a cavidade bucal está exposta a um grande número de bactérias gram-positivas e gram-negativas, mas pouco se sabe como a homeostase imunológica é mantida neste local. Sabe-se, porém, que estas bactérias produzem lipopolissacarídeos (LPS) que são reconhecidos pelos receptores *Toll-like* (TLR), que desempenham um papel crítico no início da resposta inata do organismo à invasão de patógenos. Estes receptores reconhecem motivos

estruturais altamente conservados expressos somente em microrganismos patogênicos, chamados de "*pathogen–associated microbial patterns*" (PAMPs). Os PAMPs incluem vários componentes da parede celular microbiana, como o LPS, peptideoglicanos e lipopeptídeos, bem como flagelina, DNA bacteriano e RNA viral dupla fita. A estimulação dos TLRs pelos PAMPs inicia a cascata de sinalização que envolve diversas proteínas (60). Esta cascata de sinalização leva à ativação da transcrição do fator NF-kB, o qual induz a secreção de citocinas pró-inflamatórias e citocinas efetoras que direcionam a resposta imune adaptativa.

Foi demonstrado que os cementoblastos expressam mRNA para os TLRs e CD14, capazes de aumentar a resposta imunológica ao LPS. Assim sendo, os cementoblastos participariam do processo imunológico colaborando conseqüentemente com a resposta inflamatória. O mesmo acontecendo com os monócitos e linfócitos B, estimulando vários mediadores inflamatórios. A produção destes fatores pode aumentar a capacidade de expressão de RANKL em leucócitos e a indução de osteólise. O LPS então aumenta nos osteoblastos a produção de RANKL, IL1, PGE_2 e TNF-α, cada um induzindo a atividade, viabilidade e diferenciação clástica. Ele induz a expressão de TNF-α e IL1-β em precursores de osteoclastos, independentemente se eles foram ou não pré-tratados com RANKL. Altera a atividade de RANKL por reduzir a expressão de RANK e receptores de fator de estimulação de colônias de macrófagos (M-CSF), e estimula a osteoclastogênese em células pré-tratadas com RANKL via TNF-α (61). As células apresentadoras de antígenos (APCs) do epitélio gengival também podem processar bactérias e apresentá-las às células T CD4 através do Complexo de Histocompatibilidade Principal de classe II (MHC II), e estimular a resposta do sistema imune adaptativo (62), potencializando a reação.

As células T CD4+ podem ser subdivididas em duas populações efetoras distintas, Th1 e Th2. Th0 pode ser uma população distinta e efetora, ou um estágio intermediário da diferenciação das células T CD4+ em Th1 e Th2. As células Th1 são tipicamente, produtoras de INF-γ (interferon-γ), IL2, TNF-β e TNF-α sendo essenciais para o estabelecimento de respostas imunes celulares. As células Th2 produzem, caracteristicamente, IL4, IL5, IL10, IL13 e são importantes indutoras da

síntese de IgE por células B, participando, principalmente, das alergias e infecções por helmintos, participando do perfil anti-inflamatório (59,63-65). Então, o paciente atópico possue um perfil imunológico predominantemente Th2. Para a sua correta avaliação, os pacientes devem apresentar sinais ou sintomas de atopia pessoal e familiar, assim como terem comprovação pelo teste cutâneo para avaliação de atopia, o Prick-test (66).

Este teste é selecionado por ser um teste cutâneo primariamente confirmatório para os anticorpos IgE alérgeno-específicos, que são usados para diagnóstico de doenças alérgicas em humanos (66). *Dermatophagoides pteronyssinus, Dermatophagoides farinae, Blomia tropicalis, Lollium perene, Fungos III*, são os alérgenos mais freqüentes (67-69).

As células T CD4 que ativam os macrófagos desempenham papel vital na defesa do hospedeiro contra aqueles patógenos intra e extracelulares que resistem à morte em macrófagos não ativados. A ativação de macrófagos é mediada por sinais de membrana emitidos pelas células Th1 e pela citocina ativadora de macrófagos, INF-γ, que é secretada por tais células. Uma vez ativados, os macrófagos podem matar as bactérias intracelulares e ingeridas, mas também pode causar lesão tissular local, o que explica porque essa atividade deve ser rigorosamente regulada pelas células T. As células Th1 produzem grande quantidade de citocinas e outras moléculas de superfície que não apenas ativam macrófagos infectados como também podem matar macrófagos envelhecidos cronicamente infectados, estimular a produção de novos macrófagos na medula óssea e recrutar macrófagos novos para os locais de infecção. Como resultado, as células Th1 têm um papel central no combate e na coordenação da defesa do hospedeiro contra certos agentes infectantes intracelulares. As células Th2 são essenciais na ativação das células B, para secretarem anticorpos mediadores das respostas imunes humorais dirigidas contra germes extracelulares (63, 64,70,71).

Porém, com o tempo e efetividade destas reações, por meio da fagocitose de células mortas, de fibras, contenção dos microrganismos que adentraram no alvéolo e diminuição do exsudato, se dará inicio a homeostase no local, podendo ocorrer o reparo (3,10,72).

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ANEXO A – RECOMENDAÇÕES DA AMERICAN ASSOCIATION OF ENDODONTISTS (2004) PARA TRATAMENTO DE DENTES TRAUMATIZADOS

TABLE 3. Treatment guidelines for avulsed permanent teeth with closed apex

Diagnosis and clinical situation	The tooth has already been replanted.	The tooth has been kept in special storage media, milk, saline or saliva. The extra-oral *dry time* is <60 minutes.	Extra-oral dry time is >60 minutes.
Treatment	Clean affected area with water spray, saline or chlorhexidine. Do not extract the tooth (SA).	If contaminated, clean the root surface and apical foramen with a stream of saline. Remove the coagulum from the socket with a stream of saline. Examine the alveolar socket. If there is a fracture in the socket wall, reposition it with a suitable instrument. Replant slowly with slight digital pressure (A).	Remove debris and necrotic periodontal ligament. Remove the coagulum from the socket with a stream of saline. Examine the alveolar socket. If there is a fracture of the socket wall, reposition it with a suitable instrument. Immerse the tooth in any available sodium fluoride solution for a minimum of 5 minutes. Replant slowly with slight digital pressure (SA).
Additional treatment	Suture gingival laceration, specially in the cervical area. Verify normal position of the replanted tooth radiographically Apply a flexible splint for 1-2 weeks		Suture gingival laceration, especially in the cervical area. Verify normal. position of the replanted tooth radiographically. Apply a flexible splint for 4-6 weeks.
Antibiotics	Administer systemic antibiotics: Doxycycline 2x per day for 7 days at appropriate dose for patient age and weight, or penicillin 4x per day for 7 days at appropriate dose for patient age and weight. Refer to physician to evaluate need for a tetanus booster if avulsed tooth has come in contact with soil or if tetanus coverage is uncertain.		
Patient instruction	Soft diet for 2 weeks. Brush teeth with a soft toothbrush after each meal. Use a chlorhexidine mouthrinse (0.12%) twice a day for 1 week. Follow up (see Table 5) Treatment urgency: A = Acute (within a few hours) SA = Subacute (within 24 hours) D = Delayed (more than one day)		

Treatment urgency: A = Acute (within a few hours) SA = Subacute (within 24 hours) D = Delayed (more than one day)

TABLE 4. Treatment guidelines for avulsed permanent teeth with open apex

Diagnosis and clinical situation	**The tooth has already been replanted.**	**The tooth has been kept in special storage media, milk, saline or saliva. The extra-oral *dry time* is <60 minutes**.	**Extra-oral dry time is >60 minutes.**
Treatment	Clean affected area with water spray, saline or chlorhexidine rinse. Do not extract the tooth (SA).	If contaminated, clean the root surface and apical foramen with a stream of saline. Place the tooth in doxycycline (~100 mg/20 ml saline). Remove the coagulum from the socket with a stream of saline. Examine the alveolar socket. If there is a fracture to the socket wall, reposition it with a suitable instrument. Replant slowly with slight digital pressure (A).	Replantation usually is not indicated.
Additional treatment	Suture gingival laceration, especially in the cervical area. Verify normal position of the replanted tooth radiographically. Apply a flexible splint for 1-2 weeks.		
Antibiotics	Administer systemic antibiotics: Penicillin V 4x per day for 7 days at appropriate dose for patient age and weight; or, for patients not susceptible to tetracycline staining, Doxycycline 2x per day for 7 days at appropriate dose for patient age and weight. Refer to physician to evaluate need for a tetanus booster if avulsed tooth has come into contact with soil or tetanus coverage is uncertain.		
Patient instruction	Soft diet for 2 weeks. Brush teeth with a soft toothbrush after each meal. Use a chlorhexidine mouthrinse (0.12%) twice a day for 1 week. Follow up (see Table 5)		

Treatment urgency: A = Acute (within a few hours) SA = Subacute (within 24 hours) D = Delayed (more than one day)

TABLE 5. Follow-up procedures for avulsed permanent teeth

Time	Closed apex	Open apex
1-2 weeks	S; Initiate endodontic treatment	S; Intiate endodontic treatment or monitor for revascularization
2-3 weeks	c	c
3-4 weeks	c	c
6-8 weeks	c	c
6 months	c	c
1 year	c	c
Yearly for 5 years	c	c

S = Splint removal C = Clinical and radiographic examination

Possible outcomes:

Closed Apex

(1) **Satisfactory outcome -** *Clinical:* asymptomatic, normal mobility, normal sound on percussion

Radiographic: no periradicular radiolucencies indicative of progressive external inflammatory root resorption

(>2x normal lamina dura) or loss of lamina dura indicative of ankylosis and replacement resorption

(2) **Unsatisfactory outcome -** *Clinical:* symptomatic and/or high pitch percussion sound

Radiographic: periradicular radiolucencies in the root and bone, or radiographic replacement of the root with bone

Endodontic treatment: At 7-10 days endodontic treatment should be initiated and calcium hydroxide placed. Calcium hydroxide can be replaced by gutta-percha when an intact lamina dura can be traced around the entire root surface. Usually, if the root canal treatment is initiated at the end of the ideal 7-day period, external inflammatory root resorption is prevented, and obturation can take place within a month. If, however, the endodontic treatment is initiated when root resorption is already visible, calcium hydroxide is needed for an extended period before obturation can take place. The status of the lamina dura and the presence of the calcium hydroxide in the canal should be evaluated every 3 months.

Open Apex

(1) **Satisfactory outcome -**	*Clinical:* asymptomatic, normal mobility and eruption pattern, normal sound on percussion, positive sensitivity test *Radiographic:* As with closed apex. *Continued root development, pulp lumen obliteration is very common.*
(2) **Unsatisfactory outcome -**	*Clinical:* symptomatic and/or high pitched percussion sound, tooth in infra-occlusion *Radiographic:* As with closed apex. *Root fails to develop; the pulpal lumen does not change in size.*

Endodontic treatment: If revascularization is a possibility, avoid endodontic treatment unless obvious signs of failure are present. Sensitivity test may take up to 3 months to respond positively. If endodontic treatment is necessary, follow recommendations for apexification.

ANEXO B – RECOMENDAÇÕES DA INTERNATIONAL ASSOCIATION OF DENTAL TRAUMATOLOGY (2007) PARA TRATAMENTO DE DENTES TRAUMATIZADOS

International Association of Dental Traumatology

Guidelines for the management of traumatic dental injuries

Updated March, 2007

Prepared by a committee of the International Association of Dental Traumatology:

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The guidelines represent the current best evidence based on literature research and professional opinion. As is true for all guidelines, the health care provider must apply clinical judgment dictated by the conditions present in the given traumatic situation. The IADT does not guarantee favorable s from following the Guidelines, but using the recommended procedures can maximize the chances of success.

3. Treatment guidelines for avulsed permanent teeth

Tooth with a closed apex

a. The tooth has already been replanted

b. The tooth has been kept in special storage media (Hank's Balanced Salt Solution), milk, saline, or saliva.

The extra-oral dry time is less than 60 minutes

c. Extra-oral dry time longer than 60 minutes

Treatment guidelines for avulsed permanent teeth with closed apex

Clinical situation (3.1a)	**Treatment**
Closed apex The tooth has been replanted prior to the patient arriving in the dental office or clinic.	Clean the area with water spray, saline or chlorhexidine. Do not extract the tooth. Suture gingival lacerations if present. Verify normal position of the replanted tooth both clinically and radiographically. Apply a flexible splint for up to 2 weeks. Administer systemic antibiotics. Tetracycline is the first choice (Doxycycline 2x per day for 7 days at appropriate dose for patient age and weight). The risk of discoloration of permanent teeth must be considered before systemic administration of tetracycline in young patients. (In many countries tetracycline is not recommended for patients under 12 years of age). In young patients Phenoxymethyl Penicillin (Pen V), in an appropriate dose for age and weight, can be given as alternative to tetracycline. If the avulsed tooth has contacted soil, and if tetanus coverage is uncertain, refer to physician for evaluation and need for a tetanus booster. Initiate root canal treatment 7 to 10 days after replantation and before splint removal. Place calcium hydroxide as an intra-canal medicament until filling of the root canal. **Patient instructions** Soft diet for up to two weeks. Brush teeth with a soft toothbrush after each meal. Use a chlorhexidine (0,1%) mouth rinse twice a day for 1 week. **Follow-up** See 'Follow-up procedures for avulsed permanent teeth' below.

Clinical situation (3.1b)	Treatment
Closed apex The tooth has been kept in special storage media (Hank's Balanced Salt Solution), milk, saline, or saliva. The extra-oral dry time is less than 60 minutes	If contaminated, clean the root surface and apical foramen with a stream of saline and place the tooth in saline. Remove the coagulum from the socket with a stream of saline. Examine the alveolar socket. If there is a fracture of the socket wall, reposition it with a suitable instrument. Replant the tooth slowly with slight digital pressure. Suture gingival lacerations. Verify normal position of the replanted tooth both clinically and radiographically. Apply a flexible splint for up to 2 weeks. Administer systemic antibiotics. Tetracycline is the first choice (Doxycycline 2x per day for 7 days at appropriate dose for patient age and weight). The risk of discoloration of permanent teeth must be considered before systemic administration of tetracycline in young patients. (In many countries tetracycline is not recommended for patients under 12 years of age). In young patients Phenoxymethyl Penicillin (Pen V), at appropriate dose for age and weight, can be given as alternative to tetracycline. If the avulsed tooth has contacted soil, and if tetanus coverage is uncertain, refer the patient to a physician for evaluation and need for a tetanus booster. Initiate root canal treatment 7 to 10 days after replantation and before splint removal. Place calcium hydroxide as an intra-canal medicament until filling of the root canal. **Patient instructions** Soft diet for up to two weeks. Brush teeth with a soft toothbrush after each meal. Use a chlorhexidine (0,1%) mouth rinse twice a day for 1 week. **Follow-up** See 'Follow-up procedures for avulsed permanent teeth' below.

Clinical situation (3.1c)	Treatment
Closed apex Extra-oral dry time longer than 60 minutes	Delayed replantation has a poor long term outcome. The periodontal ligament will be necrotic and not expected to heal. The goal in doing delayed replantation is to promote alveolar bone growth to encapsulate the replanted tooth. The expected eventual is ankylosis and resorption of the root. In children below the age of 15, if ankylosis occurs, and when the infraposition of the tooth crown is more than 1mm, it is recommended to perform decoronation to preserve the contour of the alveolar ridge. The technique for delayed replantation is: 1. Remove attached necrotic soft tissue with gauze. 2. Root canal treatment can be done on the tooth prior to replantation, or it can be done 7-10 days later as for other replantations. 3. Remove the coagulum from the socket with a stream of saline. Examine the alveolar socket. If there is a fracture of the socket wall, reposition it with a suitable instrument. 4. Immerse the tooth in a 2% sodium fluoride solution for 20 minutes 5. Replant the tooth slowly with slight digital pressure. Suture gingival laceration. Verify normal position of the replanted tooth clinically and radiographically. 6. Stabilize the tooth for 4 weeks using a flexible splint. Administration of systemic antibiotics, see 3.1b. Refer to physician for evaluation of need for a tetanus booster if the avulsed tooth has contacted soil or tetanus coverage is uncertain. **Patient instructions** Soft diet for up to two weeks. Brush teeth with a soft toothbrush after each meal. Use a chlorhexidine (0,1%) mouth rinse twice a day for 1 week. **Follow-up** See ‘Follow-up procedures for avulsed permanent teeth’ below.

Treatment guidelines for avulsed permanent teeth with open apex

Tooth with open apex

a. The tooth has already been replanted

b. The tooth has been kept in special storage media (Hank's Balanced Salt Solution), milk,

saline, or saliva.

The extra-oral dry time is less than 60 minutes

c. Extra-oral dry time longer than 60 minutes

Clinical situation (3.2a)	**Treatment**
Open Apex The tooth has already been replanted prior to the patient arriving in the dental office or clinic.	Clean the area with water spray, saline or chlorhexidine. Do not extract the tooth. Suture gingival lacerations if present. Verify normal position of the replanted tooth both clinically and radiographically. Apply a flexible splint for up to 2 weeks. Administer systemic antibiotics. For children 12 years and younger: Penicillin V at an appropriate dose for patient age and weight. For children older than 12 years of age, where there is little risk for tetracycline discoloration: Tetracycline (Doxycycline 2x per day for 7 days at appropriate dose for patient age and weight). Refer the patient to a physician for evaluation of need for a tetanus booster if avulsed tooth has contacted soil or tetanus coverage is uncertain. The goal for replanting still-developing (immature) teeth in children is to allow for possible revascularization of the tooth pulp. If that does not occur, root canal treatment may be recommended – see 'Follow-up procedures for avulsed permanent teeth' below. **Patient instructions** Soft diet for up to two weeks. Brush teeth with a soft toothbrush after each meal. Use a chlorhexidine (0,1%) mouth rinse twice a day for 1 week. **Follow-up** See 'Follow-up procedures for avulsed permanent teeth' below.

Clinical situation (3.2b)	Treatment
Open Apex The tooth has been kept in special storage media (Hank's Balanced Salt Solution), milk, saline, or saliva. The extra-oral dry time is less than 60 minutes	If contaminated, clean the root surface and apical foramen with a stream of saline. Remove the coagulum from the socket with a stream of saline and then replant the tooth. If available, cover the root surface with minocycline hydrochloride microspheres (ArestinTM, OraPharma Inc.) before replanting the tooth. Examine the alveolar socket. If there is a fracture of the socket wall, reposition it with a suitable instrument. Replant the tooth slowly with slight digital pressure. Suture gingival lacerations, especially in the cervical area. Verify normal position of the replanted tooth clinically and radiographically. Apply a flexible splint for up to 2 weeks. Administer systemic antibiotics. For children 12 years and younger: Penicillin V at appropriate dose for patient age and weight. For children older than 12 years of age, where there is little risk for tetracycline discoloration: Tetracycline (Doxycycline 2x per day for 7 days at appropriate dose for patient age and weight). Refer to physician for evaluation of need for a tetanus booster if avulsed tooth has contacted soil or tetanus coverage is uncertain. The goal for replanting still-developing (immature) teeth in children is to allow for possible revascularization of the tooth pulp. If that does not occur, root canal treatment may be recommended – see 'Follow-up procedures for avulsed permanent teeth' below. **Patient instructions** Soft diet for up to two weeks. Brush teeth with a soft toothbrush after each meal. Use a chlorhexidine (0,1%) mouth rinse twice a day for 1 week. **Follow-up** See 'Follow-up procedures for avulsed permanent teeth' below.

Clinical situation (3.2c)	Treatment
Open Apex Extra-oral dry time longer than 60 minutes	Delayed replantation has a poor long-term outcome. The periodontal ligament will be necrotic and not expected to heal. The goal in doing delayed replantation of immature teeth in children is to maintain alveolar ridge contour. The eventual is expected to be ankylosis and resorption of the root. It is important to recognize that if delayed replantation is done in a child, future treatment planning must be done to take into account the occurrence of tooth ankylosis and the effect of ankylosis on the alveolar ridge development. If ankylosis occurs, and when the infraposition of the tooth crown is more than 1mm, it is recommended to perform decoronation to preserve the contour of the alveolar ridge. The technique for delayed replantation is: 1. Remove attached necrotic soft tissue with gauze. 2. Root canal treatment can be done on the tooth prior to replantation through the open apex. 3. Remove the coagulum from the socket with a stream of saline. Examine the alveolar socket. If there is a fracture of the socket wall, reposition it with a suitable instrument. 4. Immerse the tooth in a 2% sodium fluoride solution for 20 minutes 5. Replant the tooth slowly with slight digital pressure. Suture gingival laceration. Verify normal position of the replanted tooth clinically and radiographically. 6. Stabilize the tooth for 4 weeks using a flexible splint. Administration of systemic antibiotics, see 3.1b. Refer the patient to a physician for evaluation of need for a tetanus booster if the avulsed tooth has contacted soil or tetanus coverage is uncertain. **Patient instructions** Soft diet for up to two weeks. Brush teeth with a soft toothbrush after each meal. Use a chlorhexidine (0,1%) mouth rinse twice a day for 1 week. **Follow-up** See ‘Follow-up procedures for avulsed permanent teeth’ below.

Follow-up procedures for avulsed permanent teeth

Root canal treatment

If root canal treatment is indicated (teeth with closed apex), the ideal time to begin treatment is 7-10 days post-replantation. Calcium hydroxide is recommended for intra canal medication for up to one month followed by root canal filling with an acceptable material. An exception is a tooth that has been dry for more than 60 minutes before replantation – in such cases the root canal treatment may be done prior to replantation.

In teeth with open apexes, that have been replanted immediately or kept in appropriate storage media, pulp revascularization is possible. Root canal treatment should be avoided unless there is clinical and radiographic evidence of pulp necrosis.

Clinical control

Replanted teeth should be monitored by frequent controls during the first year (once a week during the first month, 3, 6, and 12 months) and then yearly thereafter. Clinical and radiographic examination will provide information to determine . Evaluation may include the findings described below.

Favorable

1. Closed apex: Asymptomatic, normal mobility, normal percussion sound. No radiographic

   evidence of resorption or periradicular osteitis; the lamina dura should appear normal.
2. Open apex: Asymptomatic, normal mobility, normal percussion sound. Radiographic evidence of arrested or continued root formation and eruption. Pulp canal obliteration is the rule.

Unfavorable

1. Closed apex: Symptomatic, excessive mobility or no mobility (ankylosis) with high pitched percussion sound. Radiographic evidence of resorption (inflammatory, infection-related resorption, or ankylosis-related replacement resorption).
2. Open apex: Symptomatic, excessive mobility or no mobility (ankylosis) with high pitched percussion sound. In the case of ankylosis, the crown of the tooth will appear to be in an infra-occlusal position. Radiographic evidence of resorption (inflammatory, infection-related resorption, or ankylosis-related replacement resorption)

Splinting guidelines for tooth/bone fractures and luxated/avulsed teeth

A. Splinting times

Type of injury	**Splinting time**
Subluxation	2 weeks
Extrusive luxation	2 weeks
Avulsion	2 weeks
Lateral luxation	4 weeks
Root fracture (middle third)	4 weeks
Alveolar fracture	4 weeks
Root fracture (cervical third)	4 months

B. Type of splints

1. Wire-composite splint
2. TTS (Titanium trauma splint)
3. Unfilled resin (Protemp®, Luxatemp®, Isotemp®, Provipond®)

Last Updated (Friday, 03 August 2007)

ANEXO C – JOURNAL OF PERIODONTOLOGY

JOURNAL OF PERIODONTOLOGY

Information About the Journal:

The official journal of the AAP publishes original scientific articles to support practice, education, and research in the dental specialty of periodontics.

The publisher of the Journal of Periodontology is the American Academy of Periodontology. The Journal is available on the Internet as well as in print.

Frequency: The Journal is published monthly. Subscriptions are accepted only for the current volume/calendar year (January through December).

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Updated July 2007

CONTENT

The Journal of Periodontology publishes articles relevant to the science and practice of periodontics and related areas. Manuscripts are accepted for consideration with the understanding that text, figures, photographs, and tables have not appeared in any other publication, except as an abstract prepared and published in conjunction with a presentation by the author(s) at a scientific meeting, and that material has been submitted only to this journal.

MANUSCRIPT CATEGORIES AND SPECIFIC FORMATS

Submissions to the Journal of Periodontology should be limited to one of the categories defined below. Specific information regarding length and format is provided for each category. Please also refer to the instructions provided under Manuscript Submission, Preparation, and Format. All manuscripts will be reviewed by the Editors for novelty, potential to extend knowledge, and relevance to clinicians and researchers in the field. Some manuscripts will be returned without review, based on the Editors' judgment of the appropriateness of the manuscript for the Journal of Periodontology.

ORIGINAL ARTICLES

These are papers that report significant clinical or basic research on the pathogenesis, diagnosis, and treatment of the different forms of periodontal disease. Papers dealing with design, testing, and other features of dental implants are also included.

Format

Original articles must be limited to 4,000 words (excluding the abstract, references, and figure legends). The reference list should not exceed 50 references, and the combined number of figures and tables must be 6 or fewer. Multi-panel figures are acceptable.

Abstract

All original articles should be submitted with a structured abstract, consisting of no more than 250 words and the following four paragraphs:

* Background: Describes the problem being addressed.
* Methods: Describes how the study was performed.
* Results: Describes the primary results.
* Conclusions: Reports what authors have concluded from these results, and notes their clinical implications.

Introduction

The Introduction contains a concise review of the subject area and the rationale for the study. More detailed comparisons to previous work and conclusions of the study should appear in the Discussion section.

Materials and Methods

This section lists the methods used in the study in sufficient detail so that other investigators would be able to reproduce the research. When established methods are used, the author need only refer to previously published reports; however, the authors should provide brief descriptions of methods that are not well known or that have been modified. Identify all drugs and chemicals used, including both generic and, if necessary, proprietary names and doses. The populations for research involving humans should be clearly defined and enrollment dates provided.

Results

Results should be presented in a logical sequence with reference to tables, figures, and illustrations as appropriate.

Discussion

New and possible important findings of the study should be emphasized, as well as any conclusions that can be drawn. The Discussion should compare the present data to previous findings. Limitations of the experimental methods should be indicated, as should implications for future research. New hypotheses and clinical recommendations are appropriate and should be clearly identified. Recommendations, particularly clinical ones, may be included when appropriate.

STATE OF THE ART REVIEWS

These are focused reviews of basic and clinical science related to periodontics and implant dentistry. These reviews should be concise and address an important and timely clinical question. The review should be based on a critical assessment of the literature, and may include data or examples from the research or clinical experience of the author(s).

Authors should discuss clinical relevance and future projections. At-large submissions will be considered, but authors should contact the Editor-in-Chief before developing a manuscript to avoid duplicating a topic already in preparation. Papers should be balanced, literature-based reviews that are concise (2,000 to 3,000 words) with about 100 key references. Articles should be written at a level instructive to Journal readers. For example, clear definitions of abbreviations and a glossary of terms may be useful for defining highly technical or new terminology. Since critical reviews require selection of reports and interpretation of data, authors should not have a financial interest in the companies making products or providing services described in the review.

Format
Abstract
The abstract should summarize the main conclusions of the review in 350 words or less.
Introduction
A question or series of related questions to be addressed should be given; rationales for asking these questions and why the questions are timely should be explained.
Methods
The method of reviewing the literature should be discussed (e.g., bibliographic indexes and databases used, limits on years covered by the search, languages searched, and other important information regarding the search process should be described).
Body
A sequence of logical subsections that reflect the area being reviewed should be developed. This section should be a critical analysis of the literature, including arguments needed to support the conclusions reached; why certain papers not meeting welldescribed critical standards, such as randomized clinical trials, were not used as evidence; and what issues remain unresolved and need further study. Evidence tables are often useful in summarizing reviewed literature, and various statistical analyses appropriate to reviewing literature, such as metaanalysis, should be considered.

COMMENTARY

The purpose of these papers is to provide a forum for discussion of controversies and other issues as they relate to the practice of periodontics and implant dentistry. Full and balanced discussion of controversies on important issues is encouraged. This may result in several authors each presenting a relevant viewpoint. Commentary articles should be concise (2,000 to 3,000 words); however, they should be complete and balanced, which may require that the issue or controversy addressed be highly focused. Appropriate references should be cited.
Format
Introduction
This section should clearly state the clinical question or issues to be discussed and document their importance and timeliness.
Body
The body should present the information supporting all aspects of the issues. This portion of the Commentary may be subdivided as appropriate with headings. Figures, tables, and other illustrative materials may be incorporated.
Summary
The summary should place the issue in perspective and point a way for future directions in addressing the controversy.
Acknowledgments
Since these papers allow authors to express their opinions on a subject, it is extremely important that authors disclose any and all affiliations, financial position, or any other information that constitutes a real or perceived conflict of interest.

CASE REPORTS

These manuscripts emphasize clinical periodontics and related oral medicine and pathology. Unusual cases illustrating lesions affecting the orofacial structures that may be expected to influence management of periodontal and implant patients could be presented. Case reports should describe: 1) unique cases that may represent a previously undescribed condition; 2) unexpected association of two or more diseases; 3) adverse or unexpected treatment response; or 4) any other clinical observation based upon well-documented cases that provide important new information.

CASE SERIES

These papers report a sufficient number of consecutive or randomized cases to make a persuasive argument for or against the procedure, technique, or concept under discussion. Cases should be relatively homogeneous so that a systematic evaluation of one type of disease, lesion, or condition is made for the procedure under consideration. Also, treatment and documentation should be consistent and standardized for all cases. It is recognized that definitive evidence for the safety and efficacy of any procedure, drug, or device comes primarily from well-designed, randomized, controlled trials. However, well-executed case series may lead to hypotheses about the usefulness of new and innovative procedures, drugs, or devices and may therefore be of value to the progress of clinical science.

Format
Abstract
Case Reports and Case Series should be submitted with a structured abstract, consisting of no more than 250 words and the following four paragraphs:
* Background: Describes the clinical situation being discussed.

* Methods: Describes the clinical procedures (surgical and non-surgical) performed.
* Results: Describes the clinical results.
* Conclusions: Reports what authors have concluded, specifically clinical implications in practice situations.

Introduction

This section should include a critical review of the pertinent literature.

Case Description and Results

This section describes the case or cases, including all relevant data. For ease of presentation, tables describing longitudinal data in a chronological form may be useful. Carefully selected, high-quality clinical photographs in full color, as well as radiographs, are encouraged.

Discussion

This should include findings, put into perspective with respect to the field and literature. Unique arguments and new information gained should be summarized. Consideration of the clinical significance of the case(s) should be emphasized in all sections.

CLINICAL PRACTICE (FORMERLY INNOVATIONS IN PERIODONTICS)

These manuscripts should emphasize methods, such as the application of new technology, materials, and techniques to patient management, and should be illustrated carefully and fully, with radiographs and color clinical photographs. The innovation/method should be described in detail so that readers can duplicate the procedures. In addition, the innovation/method should have been used on a sufficient number of cases or subjects to demonstrate its utility and any adverse effects. Also, experience in use of the technique should allow the author(s) to describe situations or conditions where the procedure may not work as effectively. Only procedures that give consistent results documented over a sufficiently large number of cases should be submitted for publication. Manuscripts should be concise and should consist of an abstract, an introduction, a description of the innovation/method in conjunction with management of a case(s), and a discussion. It should be noted that certain new innovations might require human subject review and informed consent. It is the responsibility of the author to obtain these. In particular, the Editors are seeking papers describing how practitioners manage site preservation, pre-implant surgery, guided tissue regeneration, furcation preparation, root resection, suturing, and root coverage of extensively prepped teeth and/or previously restored roots, although other topics are encouraged as well.

GUEST EDITORIALS

Guest Editorials may be invited or may be submitted from authorities in certain areas as a means of offering their perspective on one or more articles published in the Journal, or on other items of interest to the readership.

LETTERS TO THE EDITOR

Letters may comment on articles published in the Journal and should offer constructive criticism. If a letter comments on a published article, the author(s) will be provided 60 days to respond to the observations. Letters to the Editor may also address any aspect of the profession, including education and training, new modes of practice, and concepts of disease and its management.

Letters should be brief, focused on one or a few specific points or concerns, and can be signed by no more than five individuals.

Citations should be handled as standard references.

MANUSCRIPT SUBMISSION, PREPARATION, AND FORMAT

The Journal of Periodontology accepts manuscript submissions online at the following URL: http://mc.manuscriptcentral.com/jperio.

Authors should prepare manuscripts in accordance with both the instructions below and the preceding instructions provided for each manuscript category.

Detailed instructions for online submission are described under ‘‘WebUploading Policies and Instructions.’’

Inquiries regarding current submissions should be sent to: Managing Editor, Journal of Periodontology, 737 North Michigan Avenue, Suite 800, Chicago, IL 60611-6660. Telephone: 312/573-3224; e-mail: julie@perio.org.

SUBMISSION

Authorship

Individuals identified as authors must meet the following criteria established by the International Committee of Medical Journal Editors:

1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;
2) drafting the article or revising it critically for important intellectual content; and
3) final approval of the version to be published.

Once the Journal has received a manuscript, any changes in authorship must be faxed to the editorial office at 312/573-3225 (attn: Bethanne Wilson, Editorial Coordinator) and must contain the signature of the author who has been added or removed from the paper. Authors who are added must submit a conflict of interest and financial disclosure form (described under ‘‘Acknowledgments and Conflicts of Interest’’).

Letter of Submission / Conflicts of Interest

A conflict of interest and financial disclosure form must be submitted for each author. A template form can be found on JOP Manuscript Central_ (http://mc.manuscriptcentral.com/jperio) in the upper right-hand corner under ‘‘Instructions & Forms.’’ More information on conflicts of interest can be found under ‘‘Conflicts of Interest’’ below.

PREPARATION

Style

Please follow the guidelines below when preparing the manuscript:

* Be sure toput thegenusandspecies of anorganism and journal names in the reference section initalics.
* The Journal of Periodontology does not italicize common Latin terms such as in vitro, in vivo, e.g., or i.e.
* Useablock style;donot tabulate or indent material.
* Refer to the 4th edition of the Glossary of Periodontal Terms published by the American Academy of Periodontology for preferred terminology.

Authors are encouraged to use the disease classification as outlined in the Annals of Periodontology, volume 4 (1999 International Workshop for a Classification of Periodontal Diseases and Conditions).

A summary can be found on the American Academy of Periodontology Web site at http://www.perio.org/resources-products/classification.htm.

FORMAT

Manuscripts must be submitted in Microsoft Word.

Margins should be at least 1’’ on both sides and top and bottom. Materials should appear in the following order:

Title Page
Abstract (or Introduction) and Key Words
Text
Footnotes
Acknowledgments
References
Figure Legends
Tables

Figures should not be embedded in the manuscript.

Authors should retain a copy of their manuscript for their own records.

TITLE PAGE

The Title Page should contain:

1) a concise but informative title;
2) first name, middle initial, and last name of each author, with the highest academic degree and the current institutional affiliation for each;
3) name of the department(s) and institution(s) to which the work should be attributed (please use footnote symbols [in the sequence *, †, ‡, §, k, ¶, #, **, etc.] to identify authors and their corresponding institutions);
4) disclaimers, if any;
5) the name and address (including fax number and e-mail) of the author(s) responsible for correspondence (please indicate whether fax number and e-mail can be published);
6) sources of support in the form of grants, equipment, drugs, or other significant sources of support;
7) any financial relationships between any author and a commercial firm that may pose a conflict of interest;
8) word count and number of figures and tables in the manuscript;
9) a short running title of no more than 60 characters, including spaces; and
10) a one-sentence summary describing the key finding(s) from the study.

ABSTRACT OR INTRODUCTION

Please see specific instructions provided for each manuscript category.

KEY WORDS

A maximum of six key words or short phrases, drawn from MeSH documentation, to facilitate indexing should be listed below the abstract.

TEXT

Please see specific instructions provided for each manuscript category.

ACKNOWLEDGMENTS AND CONFLICTS OF INTEREST

Acknowledgments

At the end of the Discussion, acknowledgments may be made to individuals who contributed to the research or the manuscript preparation at a level that did not qualify for authorship. This may include technical help or participation in a clinical study.

Authors are responsible for obtaining written permission from persons listed by name. Acknowledgments must also include a statement that includes the source of any funding for the study, and defines the commercial relationships of each author.

Conflicts of interest

In the interest of transparency and to allow readers to form their own assessment of potential biases that

may have influenced the results of research studies, the Journal of Periodontology now requires that all authors declare potential competing interests relating to papers accepted for publication. Conflicts of interest are defined as those influences that may potentially undermine the objectivity or integrity of the research, or create a perceived conflict of interest.
Authors are required to submit:
1) A statement in the manuscript, following Acknowledgments, that includes the source of any funding for the study, and defines the commercial relationships of each author. If an author has no commercial relationships to declare, a statement to that effect should be included. This statement should include financial relationships that may pose a conflict of interest or potential conflict of interest. These may include financial support for research (salaries, equipment, supplies, travel reimbursement); employment or anticipated employment by any organization that may gain or lose financially through publication of the paper; and personal financial interests such as shares in or ownership of companies affected by publication of the research, patents or patent applications whose value may be affected by this publication, and consulting fees or royalties from organizations which may profit or lose as a result of publication. An example is shown below.
2) A conflict of interest and financial disclosure form for each author. This form can be found on JOP Manuscript Central_ (http://mc.manuscriptcentral. com/jperio) in the upper right-hand corner under ''Instructions & Forms.'' The form should be completed by each author and provided to the corresponding author. The corresponding author is responsible for submitting these forms from each author when the manuscript is submitted. These forms should be sent to Bethanne Wilson, Editorial Coordinator, either via e-mail at bethanne@perio. org or fax at 312/573-3225. These forms can also be uploaded in the cover letter area during the manuscript submission process. Conflict of interest information will not be used as a basis for suitability of the manuscript for publication. Example of conflict of interest statement: This study was supported by a grant from the Acme Implant Corporation, Seoul, Korea. Drs. Able, Kim, and Bruce report no financial relationships related to any products involved in this study. Dr. Lee is on the scientific advisory board for Acme Implant Corporation and gives lectures sponsored by the company. Dr. Smith is a consultant and shareholder of the Brownstone Implant Corporation, Boston, MA. Dr. Wang is employed full-time as chief technical officer of the Acme Implant Corporation.

REFERENCES

References should be numbered consecutively in the order in which they appear in the text. A journal, magazine, or newspaper article should be given only one number; a book should be given a different number each time it is mentioned, if different page numbers are cited.
All references are identified, whether they appear in the text, tables, or legends, by Arabic numbers in superscript. Journal title abbreviations should be those used by the U.S. National Library of Medicine. If you are uncertain about the correct abbreviation for a journal title, please refer to the NLM's comprehensive listing at ftp://nlmpubs.nlm.nih.gov/online/journals/ljiweb.pdf.
The use of abstracts as references is strongly discouraged. Manuscripts accepted for publication may be cited. Material submitted, but not yet accepted, should be cited in text as ''unpublished observations.'' Written and oral personal communications may be referred to in text, but not cited as references. Please provide the date of the communication and indicate whether it was in a written or oral form. In addition, please identify the individual and his/her affiliation. Authors should obtain written permission and confirmation of accuracy from the source of a personal communication. Presented papers, unless they are subsequently published in a proceedings or peer-reviewed journal, may not be cited as references. In addition, Wikipedia.org may not be cited as a reference. For most manuscripts, authors should limit references to materials published in peer-reviewed professional journals. In addition, authors should verify all references against the original documents. References should be typed double-spaced. Examples of references are given below. Authors are encouraged to consult EndNote for the Journal of Periodontology's preferred reference style.

Journals

1. Standard journal reference. Note: list all authors if six or fewer; when seven or more, list only first three and add et al. Glass DA, Mellonig JT, Towle HJ. Histologic evaluation of bone inductive proteins complexed with coralline hydroxyapatite in an extraskeletal site of the rat. J Periodontol 1989;60:121-125.
2. Corporate author. Federation Dentaire Internationale. Technical report no. 28. Guidelines for antibiotic prophylaxis of infective endocarditis for dental patients with cardiovascular disease. Int Dent J 1987;37:235.
3. Journal paginated by issue. Card SJ, Caffesse RG, Smith BA, Nasjleti CE. New attachment following the use of a resorbable membrane in the treatment of periodontitis in dogs. Int J Periodontics Restorative Dent 1989;9(1):59-69.
4. Non-English-language titles translated into English. Buchmann R, Khoury F, Hesse T, Mu¨ller RF, Lange DE. Antimicrobial therapy of peri-implant disease (in German). Z Zahna¨rztl Implantol 1996; 12:152-157.

Books and Other Monographs

5. Personal author(s). Tullman JJ, Redding SW. Systemic Disease in Dental Treatment. St. Louis: The CV Mosby Company; 1983:1-5.
6. Chapter in a book. Rees TD. Dental management of the medically compromised patient. In: McDonald RE, Hurt WC, Gilmore HW, Middleton RA, eds. Current Therapy in Dentistry, vol. 7. St. Louis: The CV Mosby Company; 1980:3-7.

7. Agency publication. Miller AJ, Brunelle JA, Carlos JP, Brown LJ, Lo¨e H. Oral Health of United States Adults. Bethesda, MD: National Institute of Dental Research; 1987. NIH publication no. 87-2868.
8. Dissertation or thesis. Teerakapong A. Langerhans' cells in human periodontally healthy and diseased gingiva. [Thesis]. Houston, TX: University of Texas; 1987. 92 p.

Electronic Citations
9. Online journals without volume and page information. Berlin JA, Antman EM. Advantages and limitations of meta-analytic regressions of clinical trials data. Online J Curr Clin Trials [serial online]. June 4, 1994; doc 134. Accessed July 20, 2000.
10. Online journals with volume and page information. Fowler EB, Breault LG. Ridge augmentation with a folded acellular dermal matrix allograft: A case report. J Contemp Dent Pract [serial online]. 2001;2(3):31-40. Available from: Procter & Gamble Company, Cincinnati, OH. Accessed December 15, 2001.
11. Web sites. Centers for Disease Control and Prevention. Preventing emerging infectious diseases: Addressing the problem of antimicrobial resistance. Available at: http://www.cdc.gov/ncidod/emergplan/antiresist/. Accessed November 5, 2001.

TABLES

Tables should be numbered consecutively in Arabic numbers in the order of their appearance in the text.
A brief descriptive title should be supplied for each. Explanations, including abbreviations, should be listed as footnotes, not in the heading. Every column should have a heading. Statistical measures of variations such as standard deviation or standard error of the mean should be included as appropriate in the footnotes.
Do not use internal horizontal or vertical rules.

FIGURE LEGENDS

Legends should be typed double-spaced with Arabic numbers corresponding to the figure. When arrows, symbols, numbers, or letters are used, explain each clearly in the legend; also explain internal scale, original magnification, and method of staining as appropriate. Panel labels should be in capital letters.
Legends should not appear on the same page as the actual figures.

FIGURES

Digital files must be submitted for all figures.
Submit one file per figure. Multiple panels should be labeled and combined in a single file. Photomicrographs should have internal scale markings. Human subjects must not be identifiable in photographs, unless written permission is obtained and accompanies the photograph. Lettering, arrows, or other identifying symbols should be large enough to permit reduction and must be embedded in the figure file. Figure file names must include the figure number.
Clinical color photographs are encouraged. There is no charge to the author for publication of any figure.
Authors are asked to use shades of green, blue, or purple in color graphs. Yellow, red, and orange should be avoided unless scientifically necessary (e.g., to depict species of the orange complex, red complex, etc.).
Authors are strongly encouraged to prepare basic, simple designs that can be clearly understood when reproduced; use of ''3-dimensional'' graphics is not recommended. Unnecessarily complex designs may be returned for simplification before publication.
Details of programs used to prepare digital images must be given to facilitate use of the electronic image.
Use solid or shaded tones for graphs and charts.
Patterns other than diagonal lines may not reproduce well.

DIGITAL FILE SPECIFICATIONS

To ensure the highest quality reproduction of your figures, please observe the following recommendations.
Resolution
Proper resolution is very important to preserve the quality of your printed figures. The following resolutions must be submitted for your files.
Please do not reduce your figures below a readable size to achieve higher resolution. These files will not be usable.
Format
TIFF or EPS files at the proper resolution (see above) will give the best results. If you cannot produce these files, do not send low-resolution conversions. With all figures, please also send a PDF that can be rasterized in the event your files are not usable.
Word, Excel, PS, and JPEG files can sometimes be acceptable alternatives. Send these along with a PDF if you cannot achieve the proper results in TIFF or EPS format. For graphs and charts, do not use patterned fills. Solid tones or colors are recommended instead.
Color Space
Figures should be saved as CMYK, not RGB. Files submitted in RGB will be converted to CMYK, and significant color shift may occur.
Font
Files other than TIFF or JPEG must be saved with fonts embedded. Acceptable fonts include Helvetica, Times New Roman, Symbol, Mathematical PI, and European PI. All other fonts may be replaced, resulting in data loss or realignment.

Other
Please send a PDF with all figure submissions and verify that the PDF and digital versions of your figures are identical. If you have any questions concerning the creation or submission of digital art, please visit the Dartmouth Journal Services Web site at http://www.dartmouthjournals.com/digart.html or send an e-mail to perio@dartmouthjournals.com.

UNITS OF MEASUREMENT

Measurements of length, height, weight, and volume should be reported in metric units or their decimal multiples. Temperatures should be given in degrees Celsius and blood pressure in millimeters of mercury.
All hematologic and clinical chemistry measurements should be reported in the metric system in terms of the International System of Units (SI). Description of teeth should use the American Dental Association (i.e., Universal/National) numbering system.

STATISTICS

Statistical methods should be described such that a knowledgeable reader with access to the original results should be quantified and appropriate indicators of measurement error or uncertainty given. Sole reliance on statistical hypothesis testing or normalization of data should be avoided. Data in as close to the original form as reasonable should be presented.
Details about eligibility criteria for subjects, randomization, methods for blinding of observations, treatment complications, and numbers of observations should be included. Losses to observations, such as dropouts from a clinical trial, should be indicated.
General-use computer programs should be listed. Statistical terms, abbreviations, and symbols should be defined. Detailed statistical, analytical procedures can be included as an appendix to the paper if appropriate.

ANIMAL AND HUMAN TRIALS

All manuscripts reporting the use of human subjects must include a statement that the protocol was approved by the author's institutional review committee for human subjects or that the study was conducted in accordance with the Helsinki Declaration of 1975, as revised in 2000. Do not use any designation in tables, figures, or photographs that would identify a patient, unless express written consent from the patient is submitted.
For research involving the use of animals, it is necessary to indicate that the protocol was approved by the author's institutional experimentation committee or was in accordance with guidelines approved by the Council of the American Psychological Society (1980) for the use of animal experiments.

FOOTNOTES

Footnotes should be used only to identify author affiliation; to explain symbols in tables and illustrations; and to identify manufacturers of equipment, medications, materials, and devices. Use the following symbols in the sequence shown: *, †, ‡, §, k, ¶, #, **, ††, etc.

IDENTIFICATION OF PRODUCTS

Use of brand names within the title or text is not acceptable, unless essential when the paper is comparing two or more products. When identification of a product is needed or helpful to explain the procedure or trial being discussed, a generic term should be used and the brand name, manufacturer, and location (city/state/country) cited as a footnote.

REVIEW PROCESS AND PUBLICATION PROCEDURES

Peer Review
The Journal of Periodontology is a peer-reviewed publication. All manuscripts, including State of the Art Reviews, Commentaries, Case Reports, Case Series, and Clinical Practice, are submitted to a minimum of two reviewers and, when appropriate, to a statistical reviewer. Authors are given reviewer comments and additional information or observations as the Editor believes would be helpful. Revised manuscripts are due within 30 days of receipt of the Editor's communication.
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ANEXO D – TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Eu_____, RG número_____,

estou sendo convidado a participar de um estudo denominado “Avaliação de atopia e prognóstico dentário em pacientes que sofreram avulsão e reimplante”.

Sei que o para o avanço da pesquisa a participação de voluntários é de fundamental importância. Caso aceite participar desta pesquisa eu estou disposto a fazer um teste no ante-braço, onde são colocadas gotas de substâncias e leves picadas na pele, a fim de verificar se tenho alergia a estas substâncias.

Estou ciente de que minha privacidade será respeitada, ou seja, meu nome, ou qualquer outro dado confidencial, será mantido em sigilo. A elaboração final dos dados será feita de maneira codificada, respeitando o imperativo ético da confidencialidade.

Estou ciente de que posso me recusar a participar do estudo, ou retirar meu consentimento a qualquer momento, sem precisar justificar, nem sofrer qualquer dano.

As pesquisadoras envolvidas com o referido projeto são a professora Doutora Vânia Portela Ditzel Westphalen e a aluna de mestrado em Odontologia, área de concentração Endodontia, Liliane Roskamp, da Pontifícia Universidade Católica do Paraná, com quem poderei manter contato pelos telefones: Vânia (3271.2525) e Liliane Roskamp (3336.2452). Estão garantidas todas as informações que eu queira saber antes, durante e depois do estudo.

Li, portanto, este termo, fui orientado quanto ao teor da pesquisa acima mencionada e compreendi a natureza e o objetivo do estudo do qual fui convidado a participar. Concordo, voluntariamente em participar desta pesquisa, sabendo que não receberei nem pagarei nenhum valo econômico por minha participação.

_____
Assinatura do sujeito da pesquisa

_____ _____
Assinatura das pesquisadoras:

Vânia Portela Ditzel Westphalen Liliane Roskamp

Curitiba,_____de_____de 2006.

ANEXO E – APROVAÇÃO PARA REALIZAÇÃO DA PESQUISA PELO CEP/PUCPR

Pontifícia Universidade Católica do Paraná
Pró-Reitoria Acadêmica e de Pesquisa
Diretoria de Pesquisa e Programas Stricto Sensu

Curitiba, 09 de novembro de 2006.
Of. 690/06/CEP-PUCPR

Ref. "Avaliação de atopia em pacientes portadores de reabsiorção radicular"

Prezado (a) Pesquisador (es),

Venho por meio deste informar a Vossa Senhoria que o Comitê de Ética em Pesquisa da PUCPR, no dia 08 de novembro do corrente ano aprovou o Projeto Intitulado "Avaliação de atopia em pacientes portadores de reabsorção radicular", pertencente ao Grupo III, sob o registro no CEP nº 1406, e será encaminhado a CONEP para o devido cadastro. Lembro ao senhor (a) pesquisador (a) que é obrigatório encaminhar relatório anual parcial e relatório final a este CEP.

Atenciosamente,

Profª M. Sc Ana Cristina Miguez Ribeiro
Coordenadora do Comitê de Ética em Pesquisa - PUCPR

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