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**Estudo epidemiológico de 261 dentes permanentes
avulsionados de pacientes tratados em um serviço de
urgência odontológica**

**Goiânia
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ORLANDO AGUIRRE GUEDES

**Estudo epidemiológico de 261 dentes permanentes
avulsionados de pacientes tratados em um serviço de
urgência odontológica**

Tese de Doutorado apresentada ao Programa
de Pós-Graduação em Ciências da Saúde da
Universidade Federal de Goiás para obtenção
do Título Doutor em Ciências da Saúde.

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SÍMBOLOS, SIGLAS E ABREVIATURAS

%	Porcentagem
=	Igual
et al.	e outros
IIRR	Internal inflammatory root resorption
IRR	Inflammatory root resorption
OCR	Obliteração do canal radicular
PCO	Pulp canal obliteration
RRI	Reabsorção radicular inflamatória
RRII	Reabsorção radicular interna inflamatória
RRR	Replacement root resorption
RRS	Reabsorção radicular por substituição
TD	Traumatismo dentário
TDI	Traumatic dental injury
α	Nível de significância

RESUMO

Objetivo: Avaliar os aspectos epidemiológicos e fatores clínicos da avulsão de dentes permanentes. **Material e Método:** A amostra do estudo era composta por 170 pacientes (261 dentes avulsionados) atendidos no Serviço de Urgência Odontológica da Faculdade de Odontologia da Universidade Federal de Goiás, entre os anos de 2000 e 2008. As seguintes informações foram retiradas dos registros odontológicos de cada paciente: gênero, idade, fator etiológico, distribuição sazonal, grupo dentário, número de dentes avulsionados, reimplante, estágio de desenvolvimento radicular, meio de transporte, período extra-bucal, presença de dano adicional ao dente, tipo de tratamento e o tipo de complicação pós-traumática. O tratamento estatístico analisou os dados frente à distribuição de frequência e qui-quadrado. O nível de significância foi de $p < 0,05$. **Resultados:** Observou-se elevada ocorrência de avulsões em indivíduos do gênero masculino (71,18%) e com idade entre 6-10 e 11-15 anos (30,59% cada um). Os principais fatores etiológicos foram quedas (51,76%), acidentes de trânsito (29,41%) e violência (6,47%). A distribuição sazonal evidenciou elevado número de traumatismos no outono (março a junho; 31,18%) e no inverno (junho a setembro; 27,65%). O dente mais comumente afetado foi o incisivo central superior (62,45%), seguido pelo incisivo lateral superior (21,46%). Significativa proporção (67,23%) dos dentes traumatizados apresentava os ápices radiculares completamente formados. Cento e dezenove dentes avulsionados (45,59%) foram reimplantados. A maioria dos dentes (89,08%) recebeu reimplante tardio. Trinta e oito dentes (31,93%) foram conservados à seco. Reparo do periodonto foi observado em 41 dentes (34,45%), reabsorção radicular inflamatória em 44 dentes (36,97%) e reabsorção radicular por substituição em 22 dentes (18,49%). As modalidades terapêuticas mais comumente realizadas nos dentes reimplantados foram o tratamento endodôntico com a obturação temporária do canal radicular com hidróxido de cálcio (58,82%) e o tratamento endodôntico com a obturação definitiva do canal radicular (26,89%). **Conclusão:** Verificou-se elevado número de avulsões dentárias em indivíduos do gênero masculino, com idade inferior a 15 anos, decorrentes de quedas e envolvendo principalmente dentes superiores anteriores; e baixo índice de reimplantes acompanhado de significativo número de dentes acondicionados em meios não fisiológicos por longo período de

tempo. **Palavras-chave:** Traumatismo dentário, avulsão dentária, reimplante, epidemiologia bucal.

ABSTRACT

Aim: To evaluate epidemiological aspects and clinical factors of avulsion of the permanent teeth. **Material and Methods:** The sample was composed by 170 patients (261 avulsed teeth) treated in Dental Urgency Service of the Dental School of the Federal University of Goiás, Brazil, between 2000 and 2008. The following informations were collected from the patients' files: gender, age, cause of tooth avulsion, seasonal distribution, type and number of avulsed teeth, replantation, stage of root development, transport media, extra-oral period, presence of additional damage, treatment provided and post-traumatic complications. The statistical treatment analyzed data from frequency distribution and chi-square test. The level of significance was set at 5% for all analyses. **Results:** Higher occurrence of tooth avulsion was observed in males (71.18%) and patients with 6-10 and 11-15 years old (30.59% each one). The main etiologic factors involved were falls (51.76%), traffic accidents (29.41%) and violence (6.47%). The seasonal distribution showed that most cases occurred in Autumn (March to June; 31.18%), followed by Winter (June to September; 27.65%). The most affected tooth was the upper central incisor (62.45%), followed by the upper lateral incisor (21.46%). Significant proportion (67.23%) of traumatized teeth presented root apex completely formed. One hundred and nineteen teeth (45.59%) were replanted. The majority of the replanted teeth (89.08%) received delayed replantation. Thirty eight teeth (31.93%) were stored in dry media. Periodontal healing was observed in 41 teeth (34.45%), inflammatory root resorption in 44 teeth (36.97%) and replacement root resorption in 22 teeth (18.49%). The most frequent modalities of treatment for replanted teeth were endodontic treatment and the temporary filling of the root canal with calcium hydroxide (58.82%) and endodontic treatment and the definitive root canal filling (26.89%). **Conclusion:** There was a high number of dental avulsions in males, aged under 15 years, from falls and mainly involving maxillary anterior teeth, and low rate of replantation accompanied by a significant number of teeth stored in non-physiological over a long period time. **Key Words:** Dental traumatology, tooth avulsion, tooth replantation, oral epidemiology

1 INTRODUÇÃO

Os traumatismos dentários (TD) representam um sério problema de saúde pública entre indivíduos jovens. Nas últimas décadas, vários estudos têm reportado aumento significativo na prevalência dessas lesões, com significativa ameaça à qualidade de vida de crianças e adolescentes (1-3).

A avulsão dentária é um dos tipos mais graves de TD. É definida como o completo deslocamento do dente para fora do seu alvéolo (2). Sua prevalência na dentição permanente varia de 0,5% a 18,30% (2, 4), ocorre mais frequentemente em pacientes do gênero masculino com idade inferior a 14 anos (1) e o dente mais afetado é o incisivo central superior (5-8) (Tabela 1).

Após uma avulsão dentária, são observados danos severos aos tecidos pulpres e periodontais, o que pode resultar em uma série de complicações pós-traumáticas, tais como necrose pulpar, anquilose e reabsorção radicular (6, 9, 10). Eventualmente, a avulsão dentária e as suas complicações podem levar ao desenvolvimento de sequelas nos dentes permanentes (11, 12), à perda do dente traumatizado (10) ou podem afetar o crescimento do rebordo alveolar, a erupção e o posicionamento dos dentes adjacentes (13-15). O restabelecimento da estética e da função em pacientes com crescimento facial incompleto representa um desafio único para o clínico (16).

Uma vez que o prognóstico do dente reimplantado depende de medidas adequadas tomadas no local do acidente, estudos (17-19) têm sugerido a

necessidade do desenvolvimento de campanhas educativas para a conscientização da população a respeito da prevenção e do tratamento emergencial de dentes avulsionados. Entretanto, um programa de prevenção efetivo sobre a avulsão dentária deve ser preferencialmente, precedido por um estudo sobre a sua distribuição em uma determinada população e sobre os seus fatores determinantes.

A partir de evidências do reduzido número de estudos epidemiológicos na população brasileira (20) e, por considerar as especificidades e diferenças demográficas, culturais e socioeconômicas, se torna justificável analisar alguns aspectos epidemiológicos e clínicos da avulsão dentária na dentição permanente em pacientes tratados em um serviço de urgência odontológica.

Tabela 1 – Resultados de estudos prévios sobre a avulsão de dentes permanentes

Autor/Ano	País	(n)	Faixa etária	Pico de Prevalência	Fator etiológico	Índice de reimplante (%)	Tempo extra-bucal (%)	Meio de transporte (%)	Complicação pós-traumática (%)
Schatz <i>et al.</i> , 1995	Suíça	22	6-15	-	-	-	<1h (45%)	-	67,2% RRS
Ebeleseder <i>et al.</i> , 1998	Áustria	85	10-27	-	-	-	>3h (54,5%) > 45 min (41,7%)	-	29% RRI 62,1% RRS 9,7% RRI
Donaldson & Kiniirons, 2011	Irlanda do Norte	71	6-16	-	-	-	-	Leite (58,5%)	54,7% RRS
Panzarini <i>et al.</i> , 2003	Brasil	77	10 - >30	10-19	Bicicleta (25,9%) Queda (15,5%)	70,1%	> 4h (29,6%) 1-2h (24%)	Saliva (12,8%) Seco (29,8%) Soro (18,1%)	12,8% RRI -
Majorana <i>et al.</i> , 2003	Itália	-	2-26	12-21	-	-	-	-	67% RRI 33% RRS
Tzigkounakis <i>et al.</i> , 2008	República Tcheca	58	7-17	7-12	Bicicleta (39%)	30%	1-3h (50%)	Seco (33,3%)	-
Stewart <i>et al.</i> , 2008	Irlanda	46	6-21	-	Queda (26%)	-	< 1h (31,8%) > 45min (74,2%)	Soro (7,4%)	36,2% RRI
Petrovic <i>et al.</i> , 2010	Sérvia	51	7-19	10	Trânsito (25,8%) Queda (22,5%)	51,6%	15min – 9h	Seco (81,2%) Água (12,5%)	62,5% RRI 21,8% RRS
Zhang & Gong, 2011	China	88	7-75	7-17	Queda (22,7%) Bicicleta (19,3%)	71,6%	1-4h (46%)	Seco (28,5%)	-

Legendas: RRS – Reabsorção radicular por substituição

n= tamanho da amostra RRI – Reabsorção radicular inflamatória

h= hora

min=minuto

2 OBJETIVOS

O objetivo deste estudo foi investigar alguns aspectos epidemiológicos e clínicos da avulsão dentária na dentição permanente em pacientes atendidos em um serviço de urgência odontológica.

3 MATERIAL E MÉTODO

Este estudo transversal retrospectivo envolveu pacientes atendidos no Serviço de Urgência da Faculdade de Odontologia da Universidade Federal de Goiás, Goiânia (latitude 16°43'S; longitude 49°20'W), Brasil e com histórico de avulsão de dentes permanentes. A busca foi desenvolvida no período de outubro de 2000 a dezembro de 2008.

Informações relacionadas ao aspecto epidemiológico e aos fatores clínicos da avulsão de dentes permanentes (Figura 1) foram obtidas dos registros odontológicos e radiografias dos pacientes, com o auxílio de planilhas digitais, por dois estudantes de pós-graduação. Previamente à coleta dos dados, um estudo piloto, envolvendo 10% da amostra final, foi realizado para testar a viabilidade do estudo e treinar e calibrar os examinadores com relação aos critérios utilizados. Pacientes apresentando documentação incompleta e com acompanhamento clínico e radiográfico inferior a um ano foram excluídos do estudo.

O estágio de desenvolvimento radicular foi avaliado de acordo com Stewart *et al.* (21). Os ápices radiculares foram classificados como abertos se, na radiografia, as paredes do canal radicular apresentavam-se divergentes ou paralelas e foram considerados como fechados se as paredes do canal apresentavam-se convergentes. O período extra-bucal foi considerado como o tempo total em que o dente permaneceu fora do alvéolo. Dentes reimplantados

com um período extra-bucal superior a 5 minutos foram considerados como reimplante tardio (22).

As complicações pós-traumáticas foram registradas analisando todas as radiografias de preservação. A reabsorção radicular por substituição (RRS) foi registrada na presença da perda de tecido radicular com reposição óssea concomitante, estando à perda do espaço do ligamento periodontal não associada à radiolucidez; a reabsorção radicular inflamatória (RRI) foi diagnosticada sempre que o dente apresentava, radiograficamente, perda de tecido radicular com concomitante perda de tecido ósseo associada à radiolucidez (5); a reabsorção radicular interna inflamatória (RRII) foi registrada quando um alargamento radiolúcido, de forma oval ou arredondado do espaço do canal radicular foi observado nas radiografias (23) e a obliteração do canal radicular (OCR) foi diagnosticada pela obliteração da cavidade pulpar observada radiograficamente (24).

O protocolo do estudo foi aprovado pelo Comitê de Ética em Pesquisa da Universidade Federal de Goiás (Protocolo nº 055/2005).

A análise estatística dos dados foi realizada com o programa SPSS for Windows 19.0 (SPSS Inc., Chicago, IL, USA) e incluiu distribuição de frequência e teste de associação. A significância estatística para a associação entre as variáveis foi determinada pela utilização do teste qui-quadrado. O nível de significância estabelecido foi de $p < 0,05$.

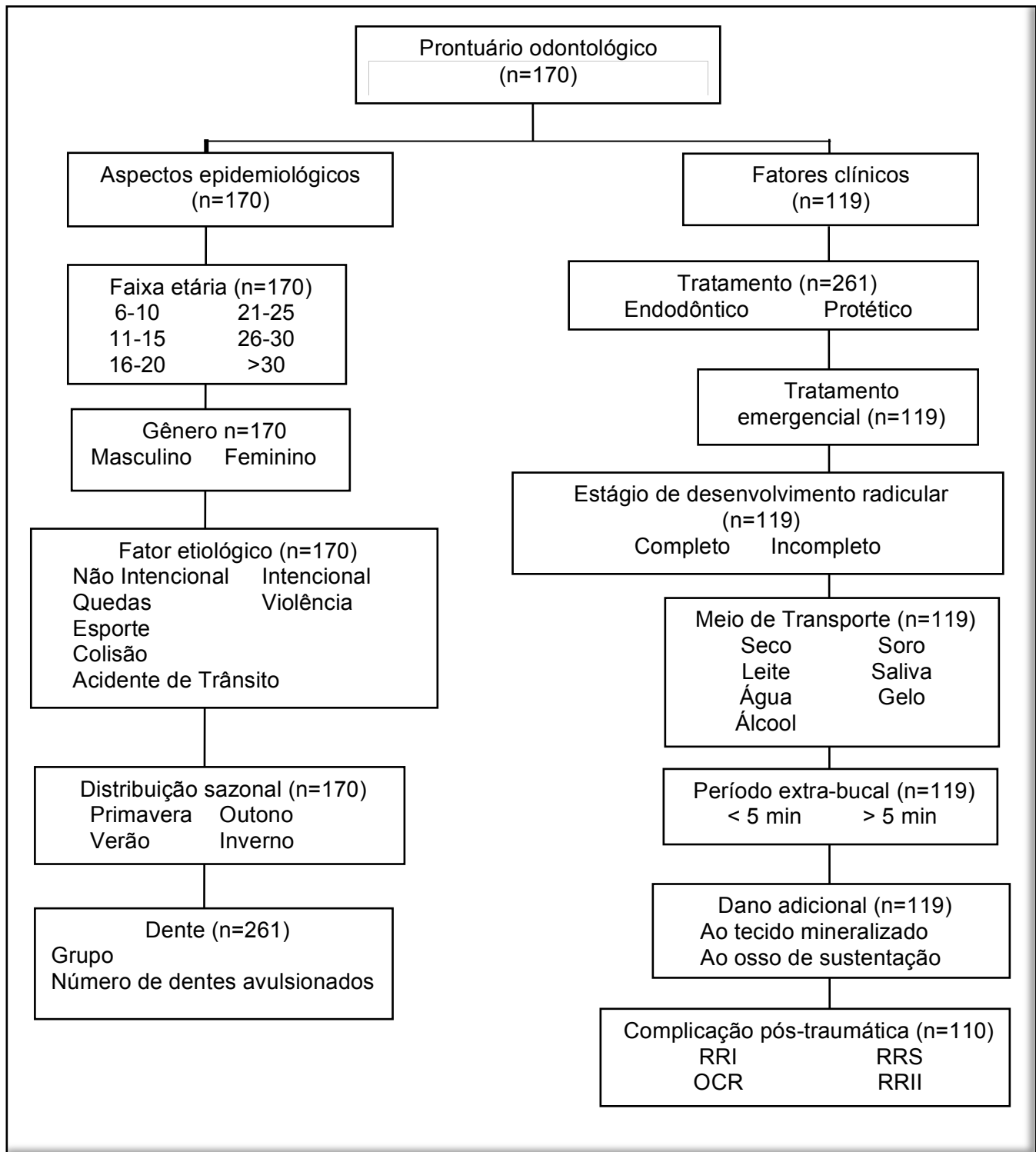


Figura 1. Informações coletadas dos prontuários e das radiografias dos pacientes.

4 RESULTADOS

Faixa etária e gênero

A análise envolveu 170 pacientes com histórico de avulsão dentária, com idade variando entre 6 e 43 anos (média de 15,9 anos, desvio padrão de 7,97). As maiores frequências de avulsão foram registradas nos participantes de 6-10 (30,59%) e 11-15 anos de idade (30,59%), seguido dos participantes de 16-20 anos de idade (15,88%) (Tabela 2). Do total de registros analisados, 121 (71,18%) eram do gênero masculino e 49 (28,82%) do gênero feminino, sendo observada uma proporção entre homens e mulheres de 2,4:1.

Fator etiológico

Cento e cinquenta e nove participantes (93,53%) sofreram avulsão devido a causas não-intencionais e onze (6,47%) a causas intencionais. Quedas (51,76%), acidentes de trânsito (29,41%) e violência (6,47%) foram os principais fatores etiológicos. Observou-se uma variação entre o fator etiológico e o gênero dos participantes. Atividades esportivas, violência e colisões resultaram em 4 (2,35%), 9 (5,29%) e 5 (2,94%) eventos traumáticos em pacientes do gênero masculino, respectivamente, e 0 (0,00%), 2 (1,18%) e 0 (0,00%) em pacientes do gênero feminino, respectivamente. No entanto, esta variação não foi estatisticamente significativa ($p>0,05$). O teste do qui-quadrado revelou uma diferença estatisticamente significativa entre o fator etiológico e a

faixa etária ($p < 0,05$). Quedas foram a causa mais comum de avulsão dentária entre os participantes com idade inferior a 15 anos (41,18%). No entanto, com o aumento da idade, os acidentes automobilísticos constituíram-se no principal agente etiológico das lesões traumáticas, sendo responsável por 16,47% dos acidentes (Tabela 2).

Distribuição sazonal

A distribuição sazonal revelou que a maioria dos casos ocorreu no outono (março a junho; 31,18%), seguido pelo inverno (junho a setembro; 27,65%), primavera (setembro a dezembro; 23,53%) e verão (dezembro a março; 17,65%).

Grupo dentário e número de dentes avulsionados

Os pacientes apresentaram um total de 261 dentes permanentes avulsionados, representando cerca de 1,5 dentes avulsionados por acidente. Duzentos e vinte e seis (86,59%) localizavam-se na maxila e 35 (13,41%) na mandíbula. Os dentes mais comumente afetados foram os incisivos centrais superiores (62,45%), seguidos pelos incisivos laterais superiores (21,46%) e incisivos centrais inferiores (5,75%) (Figura 2). Cento e onze participantes (65,29%) apresentaram o envolvimento de apenas um dente, 38 (22,35%) de dois dentes, e 21 (12,35%) apresentaram três ou mais dentes avulsionados.

Tratamento emergencial e o estágio de desenvolvimento radicular

Dos 261 dentes avulsionados, 119 (45,59%) foram reimplantados após o acidente. Destes, 80 (67,23%) apresentavam completa formação radicular, enquanto 39 (32,77%) apresentavam rizogênese incompleta. Cento e quarenta e dois dentes (54,41%) não foram reimplantados.

Meio de transporte

Trinta e oito dentes (31,93%) foram armazenados em meio seco, 20 (16,81%) em solução salina, 20 (16,81%) em leite, 15 (12,61%) em água, 5 (4,20%) em álcool, 4 (3,36%) em saliva e 1 (0,84%) em gelo. Informação sobre o meio de transporte não pôde ser determinada em 16 (13,45%) dos 119 dentes reimplantados.

Período extra-bucal

Nenhum dente foi reimplantado com o tempo inferior a 5 minutos. Cento e seis dentes (89,08%) receberam reimplante tardio. Destes, 42 (35,29%) foram reimplantados até 60 minutos após a lesão traumática, enquanto 26 (21,85%) foram reimplantados entre 1 e 2 horas e 38 (31,93%) com mais de 2 horas após o acidente. Informação sobre o período extra-bucal não pôde ser avaliada em 13 dentes (10,92%).

Presença de dano adicional ao dente

A associação entre outros tipos de TD e a avulsão foi observada em 31 (26,05%) dos 119 dentes reimplantados. O tipo mais comum de lesão foi a

fratura não complicada da coroa (n=22; 70,97%), seguida pela fratura complicada da coroa (n=5; 16,13%), fratura do processo alveolar (n=3; 9,67%) e fratura corono radicular complicada (n=1; 3,23%). Apenas 4 dentes (3,36%) apresentaram TD recorrentes.

Tratamento odontológico

A avaliação do tipo de tratamento realizado foi subdividida em tratamento para dentes reimplantados e tratamento para dentes não-reimplantados. Para os dentes reimplantados, a modalidade mais frequente foi o tratamento endodôntico com o preenchimento temporário do canal radicular com hidróxido de cálcio (n=70; 58,82%), seguido do tratamento endodôntico com a obturação definitiva do canal radicular (n=32; 26,89%), extração (n=4; 3,36%), reabilitação protética (n=4; 3,36%), tratamento endodôntico com obturação definitiva do canal radicular associado à movimentação ortodôntica (n=2; 1,68%), mantenedor de espaço (n=1; 0,84%) e reabilitação protética associada a movimentação ortodôntica (n=1; 0,84%). Para os dentes não reimplantados, foram realizados exame clínico e anamnese (n=117; 82,39%), reabilitação protética (n=22; 15,49%), mantenedor de espaço (n=1; 0,70%), movimentação ortodôntica (n=1; 0,70%) e transplante dentário associado a tratamento endodôntico com o preenchimento temporário do canal radicular com hidróxido de cálcio (n=1; 0,70%).

Complicações pós-traumáticas

Os dentes reimplantados foram preservados por um período de 1 a 8 anos. O acompanhamento radiográfico revelou 44 dentes (36,97%) com RRI, 41 dentes (34,45%) com reparo periodontal, 22 dentes (18,49%) com RRS, 2 dentes (1,68%) com OCR e 1 dente (0,84%) com RRII. Informação relacionada ao tipo de complicação pós-traumática não pôde ser coletada em 9 dentes (7,56%).

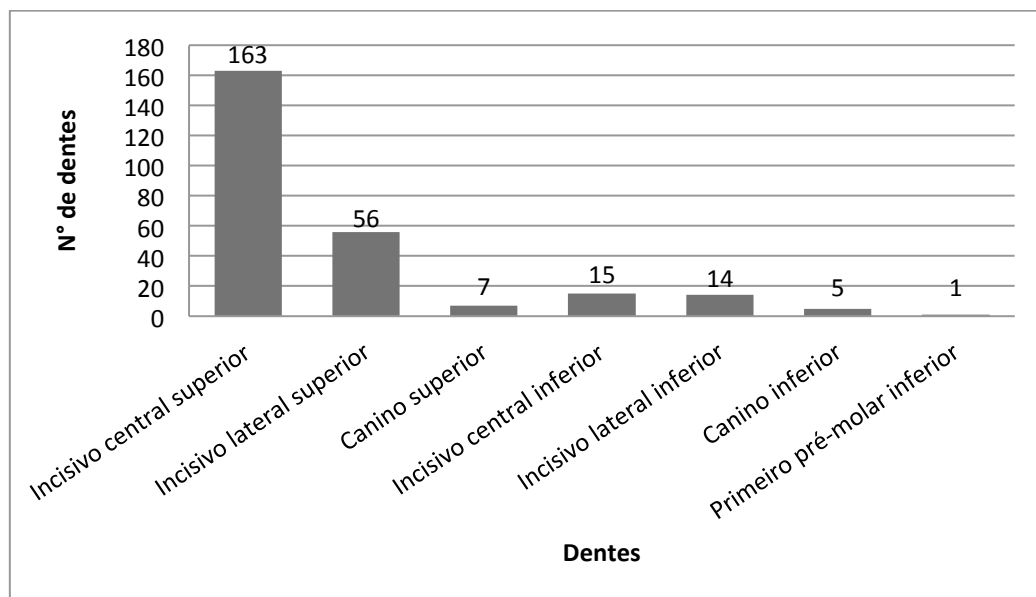
Cinquenta e dois dentes foram preservados por um período de 1 a 2 anos e apresentaram os seguintes resultados: reparo periodontal (24 dentes; 46,15%); RRS (9 dentes; 17,31%), RRI (18 dentes; 34,62%) e OCR (1 dente; 1,92%). Onze dentes foram acompanhados por um período de 2 a 3 anos, sendo observado 1 dente com reparo periodontal (9,09%); 5 dentes com RRS (45,45%), 3 dentes com RRI (27,27%), 1 dente com OCR (9,09%) e 1 dente com RRII (9,09%). Trinta e três dentes foram acompanhados por mais de 3 anos, período em que foram observados 8 dentes com reparo periodontal (24,24%), 8 dentes com RRS (24,24%) e 16 dentes com RRI (51,52%).

A análise entre o período de acompanhamento e as complicações pós-traumáticas não pôde ser estabelecida em 14 dentes (12,73%), devido ao fato de que alguns pacientes mudaram de cidade, perdendo a consulta de acompanhamento ou, simplesmente, abandonaram o tratamento.

Tabela 2 - Distribuição dos fatores etiológicos das avulsões dentárias em função da faixa etária e do gênero

	Fatores etiológicos							Total (%)
	Queda (%)	Acidente automobilístico (%)	Práticas esportivas (%)	Violência (%)	Colisão (%)	Outros (%)		
Faixa etária (n=170)								
6-10	39 (22,94%)	7 (4,12%)	1 (0,59%)	0 (0,00%)	2 (1,18%)	3 (1,76%)	52 (30,59%)	
11-15	31 (16,76%)	15 (8,82%)	2 (1,18%)	3 (1,76%)	0 (0,00%)	1 (0,59%)	52 (30,59%)	
16-20	9 (5,29%)	10 (5,88%)	1 (0,59%)	5 (2,94%)	1 (0,59%)	1 (0,59%)	27 (15,88%)	
21-25	6 (3,53%)	7 (4,12%)	0 (0,00%)	1 (0,59%)	0 (0,00%)	3 (1,76%)	17 (10,00%)	
26-30	2 (1,18%)	7 (4,12%)	0 (0,00%)	1 (0,59%)	1 (0,59%)	1 (0,59%)	12 (7,07%)	
> 30	1 (0,59%)	4 (2,35%)	0 (0,00%)	1 (0,59%)	1 (0,59%)	3 (1,76%)	10 (5,88%)	
Gênero (n=170)								
Masculino	63 (37,06%)	35 (20,59%)	4 (2,35%)	9 (5,29%)	5 (2,94%)	5 (2,94%)	121 (71,17%)	
Feminino	25 (14,71%)	15 (8,82%)	0 (0,00%)	2 (1,18%)	0 (0,00%)	7 (4,12%)	49 (28,83%)	

Figura 2 - Distribuição dos casos de avulsão dentária em função do dente envolvido.



5 DISCUSSÃO

O conhecimento dos fatores clínicos envolvidos com o resultado epidemiológico dos TD é importante em função de algumas implicações, como por exemplo, as reabsorções radiculares e as alterações pulpares.

Do ponto de vista epidemiológico, os resultados do presente estudo estão em concordância com os dados apresentados previamente sobre a avulsão na dentição permanente (7, 8, 20, 25, 26). Os dados coletados confirmam que indivíduos do gênero masculino sofrem, significativamente, mais avulsões dentárias do que os do gênero feminino (2,4:1). Em geral, homens estão mais envolvidos em atividades físicas de maior contato físico e ainda sem a utilização de proteção adequada (1, 3). No entanto, estudos recentes apontam uma redução, ou até mesmo, uma inversão nessa disparidade entre os gêneros (5, 21, 27).

A avulsão dentária tem sido observada com maior frequência entre as idades de 7 a 14 anos (1). No presente estudo, a idade dos pacientes com histórico de avulsão variou de 6 a 43 anos. Elevada prevalência foi observada nos grupos de 6 a 10 e 11 a 15 anos, juntos representaram, aproximadamente, 61% da amostra. Zhang & Gong (8) observaram maior frequência de avulsões na faixa etária de 7 a 17 anos (35,22%), enquanto Panzarini *et al.* (20), no grupo etário de 10 a 19 anos (53,24%). Odoi *et al.* (28) analisaram a associação entre problemas de comportamento e a ocorrência de TD em crianças de 7-15 anos de idade. Estes autores observaram que crianças

apresentando problemas de relacionamento com colegas, como por exemplo, *bullying*, apresentavam maior propensão em sofrer TD.

A maioria das avulsões ocorreu em função de fatores não-intencionais, como quedas (51,76%) e acidentes de trânsito (29,41%). Os fatores etiológicos variaram de acordo com a faixa etária estudada. A queda foi responsável pela maioria das avulsões dentárias em crianças de 6-15 anos. Com o aumento da idade, os acidentes de trânsito se tornaram o principal agente etiológico, como relatado por Uji & Teramoto (29). Tem sido enfatizado que o lugar onde o estudo foi realizado e o grupo etário envolvido na amostra deve receber apropriada consideração durante a análise do fator etiológico dos TD (8, 26).

Os incisivos centrais superiores foram os dentes mais afetados, aspecto também observado previamente (5-8). A posição vulnerável desse dente, que ainda pode se encontrar protruído e/ou com cobertura labial inadequada, podem explicar estes achados (3).

Cento e onze pacientes (65,29%) apresentaram apenas um dente avulsionado. Alguns indivíduos apresentaram o envolvimento de 3, 4 ou, até mesmo, 6 dentes. Andreasen *et al.* (9) observaram maior número de casos de avulsão com o envolvimento de mais de 1 dente. O número de dentes avulsionados parece variar de acordo com o fator etiológico do trauma. Assim, lesões traumáticas decorrentes de acidentes de trânsito, podem apresentar aumentado número de dentes envolvidos (30). Danos adicionais podem estar associados aos casos de avulsão; entre eles, lesões aos tecidos mineralizados do dente. Dano adicional à coroa dos dentes foi observado em 31 dos 119 dentes reimplantados (26,05%), dos quais 70,97% eram fraturas coronárias não complicadas. Fator com relevância desde que Donaldson & Kinirons (6)

detectaram risco aumentado de reabsorção radicular de início precoce em casos apresentando danos adicionais à coroa no momento do reimplante.

Com relação ao estágio de desenvolvimento radicular, 39 dos 119 dentes reimplantados (32,77%) apresentavam rizogênese incompleta. Esta prevalência é semelhante à observada por Gonda *et al.* (27) (31,03%), Barret & Kenny (10) (38,46%) e Stewart *et al.* (21) (28,78%), maior do que a registrada por Andreasen *et al.* (22) (15,07%) e menor do que a observada por Petrovic *et al.* (26) (48,38%). Schatz *et al.* (31) em um estudo clínico e radiográfico observaram elevada porcentagem de dentes com formação radicular completa e ápices abertos. Entretanto, deve-se ter cautela ao se comparar os resultados entre estudos realizados em diferentes grupos etários, visto que alguma variação entre a idade dentária e a biológica pode ser esperada (32).

O estágio de desenvolvimento radicular tem sido identificado como um preditor para o reparo periodontal e pulpar, no qual o diâmetro do forame apical está diretamente relacionado com a possibilidade de revascularização deste tecido (33). Embora Ebeleseder *et al.* (14) tenham identificado elevado número de casos com revascularização da polpa em dentes com formação radicular incompleta, Petrovic *et al.* (26) diagnosticaram significativamente maior porcentagem de complicações em dentes com essa característica. Elevada taxa de insucesso no tratamento de dentes avulsionados com ápices abertos também foi observada por Andreasen *et al.* (21) e Barret & Kenny (10).

Mesmo na presença de um prognóstico duvidoso, o tratamento de escolha para dentes avulsionados deveria ser o reimplante. No presente estudo foi observado baixo índice de dentes reimplantados (45,59%). Este achado coincide com as observações de Kinoshita *et al.* (34) no Japão (43,75%),

Tzigkounakis *et al.*(7) na República Checa (30%) e Petrovic *et al.* (26) na Sérvia (48,38%). Panzarini *et al.* (20), no Brasil, e Zhang Gong (8), na China, observaram elevadas taxas de dentes reimplantados, 70,13% e 70,83%, respectivamente. As principais razões para a não realização do reimplante são: falta de conhecimento das pessoas no local do acidente sobre como manusear o dente avulsionado, o dente avulsionado não ser encontrado, demora na busca pelo atendimento odontológico ou hospitalização devido a ferimentos mais graves (7, 8, 20).

Os fatores mais críticos para a condição do ligamento periodontal de dentes avulsionados são o meio de transporte e o período extra-bucal (21, 35). Pohl *et al.* (36) avaliaram a cicatrização do ligamento periodontal em 28 dentes permanentes avulsionados. O ligamento periodontal de 6 dentes, armazenados em um meio de cultura celular por 1-53 h, foi classificado como não comprometido. Dezesesseis dentes foram inadequadamente conservados por um curto período de tempo e tiveram o seu ligamento periodontal classificado como comprometido. Outros seis dentes também armazenados em meios classificados como não fisiológicos, só que por um longo período de tempo, tiveram o seu ligamento periodontal considerado irreparável. Chappuis & von Arx (37) em um estudo de acompanhamento de 1 ano de 45 dentes avulsionados observaram elevada ocorrência de RRS em dentes mantidos a seco por longos períodos. A RRS variou de 9,5% nos dentes mantidos em condição insatisfatória por até 15 minutos a 100% nos dentes mantidos nessa mesma condição por período maior que 60 minutos. No presente estudo, a maioria dos pacientes manteve seus dentes armazenados em meios de conservação inadequados, 38/119 dentes reimplantados foram acondicionados

a seco antes do reimplante. Uma possível explicação para este achado pode ser a falta de conhecimento da população envolvida no estudo sobre a melhor maneira de armazenamento de dentes avulsionados.

O reimplante do dente avulsionado ocorre mais frequentemente entre 1 e 5 h após o acidente (7, 8, 20, 27). Boyd *et al.* (5) observaram que período extra-bucal foi o principal fator de predisposição para a ocorrência de RRI. No presente estudo, 89,08% dos dentes avulsionados receberam reimplante tardio.

Complicações após o reimplante de dentes avulsionados são comuns, com uma prevalência relatada de 57 a 83% (34,39). No presente estudo, a prevalência total de complicações foi menor (57,98%) do que a observada por Schatz *et al.* (34) (83,3%) e Petrovic *et al.* (26) (84,4%). A RRI foi o tipo de complicação mais diagnosticada, sendo mais prevalente do que a RRS, 36,97% e 18,49%, respectivamente. Vários fatores podem ter contribuído para este resultado desfavorável, como por exemplo, significativa proporção dos dentes avulsionados foram armazenados em meios considerados como não-fisiológicos e/ou apresentaram um longo período extra-alveolar. RRI está relacionada com a infecção do tecido pulpar e pode ser prevenida e/ou tratada por meio de um adequado tratamento endodôntico. Estudos futuros baseados em novos métodos de diagnóstico e ferramentas de pesquisa (39, 40) são necessários para avaliar a eficácia dos diferentes protocolos terapêuticos e suas implicações ao longo do tempo.

De acordo com as diretrizes publicadas (41, 42) sobre o manejo adequado de dentes avulsionados, a decisão clínica da realização do tratamento endodôntico deve ser tomada como base no estágio de

desenvolvimento radicular e o tempo extra-alveolar. Neste estudo, para os dentes reimplantados, a modalidade terapêutica mais registrada foi o tratamento endodôntico com obturação temporária do canal radicular com hidróxido de cálcio e o tratamento endodôntico com obturação definitiva do canal radicular (85,71%).

A falta de dados epidemiológicos sobre a avulsão de dentes permanentes em várias regiões geográficas do Brasil motivou a realização deste estudo, que teve como objetivo, coletar informações sobre diversos fatores relacionados a avulsão dentária na cidade de Goiânia, cidade localizada na região Centro-Oeste do Brasil. Para que ações em saúde bucal sejam efetivas, estas devem ser baseadas em dados de prevalência e fatores clínicos.

Baseado nos dados obtidos pode ser sugerido o estabelecimento de campanhas capazes de estimular a propagação das diretrizes sobre o manejo adequado de dentes avulsionados. Campanhas de prevenção certamente apresentam menores custos quando comparadas as implicações terapêuticas dos TD (43-45).

6 CONCLUSÃO

Baseado na metodologia em apreço é prudente concluir que:

Os aspectos epidemiológicos e clínicos da avulsão de dentes permanentes no serviço de urgência odontológica são semelhantes aos observados em estudos realizados em outras populações. Em que se verifica:

1. Elevado número de avulsões dentárias em indivíduos do gênero masculino, com idade inferior a 15 anos, decorrentes de quedas e envolvendo principalmente os dentes superiores anteriores;

2. Baixo índice de reimplantes acompanhado de significativo número de dentes acondicionados por longos períodos de tempo em meios inapropriados.

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8 PUBLICAÇÃO

Artigo:

Epidemiological study of 261 avulsed permanent teeth of patients treated in a Dental Urgency Service

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Revista (Submetido):

Dental Traumatology

Epidemiological study of 261 avulsed permanent teeth of patients treated in a
Dental Urgency Service

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Key Words: Dental trauma, tooth avulsion, tooth replantation, oral epidemiology

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Abstract:

Aim: To evaluate the epidemiological aspects and clinical factors associated with avulsion of permanent teeth. **Material and Methods:** The sample consisted of 261 avulsed teeth of 170 patients seen in the Dental School of the Federal University of Goiás, Brazil, from 2000 to 2008. **Results:** The highest incidence was found among boys (71.18%) aged 6-15 years (61.18%). The main etiologic factors were falls (51.76%) and traffic accidents (29.41%). Most cases occurred in autumn (March to June; 31.18%) and winter (June to September; 27.65%). Most avulsed teeth were the maxillary central incisor (62.45%), followed by the maxillary lateral incisor (21.46%). A high proportion (67.23%) of injured teeth had a completely formed root apex. Replantation was used to treat 190 teeth (45.59%). Most replantations were delayed (89.08%). Thirty eight teeth (31.93%) were stored in dry media. Periodontal healing was found in 41 teeth (34.45%), inflammatory root resorption, in 44 (36.97%) and replacement root resorption, in 22 (18.49%). The most frequent treatments for replanted teeth were endodontic treatment and temporary filling of the root canal with calcium hydroxide (58.92%) and endodontic treatment and definitive root canal filling (26.89%). **Conclusion:** The epidemiological and clinical aspects of tooth avulsion in this study were similar to those reported in other studies. The number of replantations was low, the number of teeth stored in non-physiological conditions was high, and replantation was often delayed.

Introduction

Traumatic dental injuries (TDI) in young people are a serious public health problem. Several studies have reported that TDI prevalence has increased along the past few decades, which poses a significant threat to the dental health of children and adolescents (1-3).

Tooth avulsion, one of the most serious types of TDI, is defined as the complete displacement of a tooth out of its socket (2). The prevalence of avulsed teeth in permanent dentition ranges from 0.5% to 18.30% (2, 4). Male patients younger than 14 years experience it more often (1), and the tooth most commonly affected is the maxillary central incisor (5-8).

After tooth avulsion, there may be extensive damage to pulp and periodontal tissues, which may result in post-traumatic complications, such as pulp necrosis, ankylosis and root resorption (6, 9, 10). Tooth avulsion and its complications may lead to the development of sequelae to permanent teeth (11, 12) and loss of the injured tooth (10), or may affect the growth of the alveolar ridge and the eruption and position of adjacent teeth (13-15). The reestablishment of aesthetics and function in patients with incomplete facial growth is a unique challenge to clinicians (16).

The prognosis of avulsed teeth depends on the proper measures taken at the place of accident, and studies (17-19) have suggested the need to develop educational campaigns and produce knowledge about prevention and emergency management of avulsed teeth. However, an effective educational program about tooth avulsion should be preceded by an investigation on the occurrence of this injury in the community.

Information about the characteristics of tooth avulsion in different geographical regions of Brazil is limited (20). This study investigated the epidemiological and clinical aspects associated with avulsion of permanent teeth of patients treated in a dental urgency service.

Materials and methods

This cross-sectional study evaluated data of patients referred to the Dental Urgency Service of the Dental School of the Federal University of Goiás, Goiânia (latitude 16°43'S and longitude 49°20'W), Brazil, due to avulsion of permanent teeth from October 2000 to December 2008.

Data about the patients were collected (Figure 1) from charts and radiographs using computer readable data collection sheets by two graduate students. Before data collection, a pilot study with 10% of the final sample was conducted to test study feasibility and to train the examiners to use study criteria. Cases with incomplete documentation were excluded.

The stage of root development was assessed using the parameters defined by Stewart et al. (21). The root apices were classified, according to radiographs, as open if their root canal was divergent or parallel, and as closed if the canal walls were convergent. Extra-oral time was the total time of the tooth outside the socket. Teeth replanted 5 minutes after injury were classified as delayed replantation (22).

Post-traumatic complications were recorded according to the analysis of all follow-up radiographs. Root replacement resorption (RRR) was defined as radiographic loss of root substance and concurrent bone replacement, such that there was loss of periodontal ligament space and no associated radiolucency;

inflammatory root resorption (IRR) was diagnosed in case of loss of root substance according to radiographs and concurrent loss of bone substance and associated radiolucency (5); internal inflammatory root resorption (IIRR) was recorded when a radiolucent, round and symmetrical widening of the root canal space was observed on follow-up radiographs (23) and pulp canal obliteration (PCO) was diagnosed by the apparent loss of pulp space on radiographs (24).

This study was approved by the local Research Ethics Committee (Process #055/2005).

Data were analyzed using the SPSS for Windows 19.0 (SPSS Inc., Chicago, IL), including frequency distribution and cross-tabulation. Chi-square tests were used to compare qualitative data, and the level of statistical significance was set at 5%.

Results

Patient age and sex

This study enrolled 170 patients (121 male patients, 71.18%; male-to-female ratio = 2.4:1), aged 6 to 43 years (mean = 15.9 years, standard deviation = 7.97). The highest avulsion frequencies were in the groups of patients aged 6-10 and 11-15 years (30.59% each) and 16-20 years (15.88%) (Table 1).

Cause of tooth avulsion

One hundred fifty nine participants (93.53%) had avulsion because of non-intentional reasons, and 11 (6.47%), because of intentional reasons. Falls (51.76%), traffic accidents (29.41%) and violence (6.47%) were the main causes of tooth avulsion. There were differences between sexes, with sport

activities, violence and collisions resulting in 4 (2.35%), 9 (5.29%) and 5 (2.94%) teeth avulsion among male patients, and 0 (0%), 2 (1.18%) and 0 (0%) among female patients. However, this variation was not statistically significant ($P>0.05$). The chi-square test showed a statistically significant difference between etiological factor and age ($P<0.05$). Falls were the most common cause in patients younger than 15 years (41.18%). As age increased, traffic accidents were the main etiological factor of tooth avulsion (16.47%) (Table 1).

Seasonal distribution

The season when most cases occurred was autumn (March to June; 31.18%), followed by winter (June to September; 27.65%), spring (July to December; 23.53%) and summer (December to March; 17.65%).

Type and number of avulsed teeth

There were 261 avulsed permanent teeth, at about 1.5 teeth per TDI. Two hundred and twenty six (86.59%) avulsed teeth were in the maxillary arch, and 35 (13.41%), in the mandibular arch. Most avulsed teeth were maxillary central incisors (62.45%), followed by maxillary lateral incisors (21.46%), and mandibular central incisors (5.75%) (Figure 2). One hundred and eleven participants (65.29%) had one tooth avulsed, 38 (22.35%), two teeth, and 21 (12.35%), three or more teeth.

Replantation and stage of root development

Of the 261 avulsed teeth, 119 teeth (45.59%) were treated with replantation. The percentage of replanted teeth with complete root formation

and closed apex was 67.23%, whereas 32.77% had the apices just about to be completed. One hundred and forty two teeth (54.41%) were treated without replantation.

Transport medium

Thirty eight teeth (31.93%) were stored in dry media, 20 (16.81%) in saline, 20 (16.81%) in milk, 15 (12.61%) in water, 5 (4.20%) in alcohol, 4 teeth (3.36%) in the patient's oral cavity and 1 tooth (0.84%) was stored in ice. Information about the transport medium could not be determined in 16 (13.45%) of the 119 replanted teeth.

Extra-oral time

No tooth was replanted less than 5 minutes after avulsion. Replantation was delayed for 106 replanted teeth (89.08%): 42 (35.29%) were replanted 60 minutes after injury, 26 (21.85%), 1 to 2 hours and 38 (31.93%), more than 2 hours after the accident. Information about extra-oral time was not available for 13 teeth (10.92%).

Additional tooth damage

Other TDI associated with tooth avulsion were found in 31 replanted teeth (26.05%). The most common type of injury was uncomplicated crown fracture (n=22; 70.97%), followed by complicated crown fracture (n=5; 16.13%), fracture of the alveolar process (n=3; 9.68%) and complicated crown-root fracture (n=1; 3.23%). Only 4 teeth (3.36%) had recurrent TDI.

Treatment

Treatments were subdivided into treatment for replanted teeth and treatment for non-replanted teeth. Most replanted teeth received endodontic treatment and root canal filling with calcium hydroxide (70 teeth; 58.82%) followed by endodontic treatment and root canal filling (32 teeth; 26.89%), extraction (4 teeth; 3.36%), prosthodontic rehabilitation (4 teeth; 3.36%), endodontic treatment and root canal filling associated with orthodontic movement (2 teeth; 1.68%), space maintainer (1 tooth; 0.84%) and prosthodontic rehabilitation associated with orthodontic movement (1 tooth; 0.84%). For the non-replanted teeth, the most frequent treatment was analysis of history and clinical exam (117 teeth; 82.39%) followed by prosthodontic rehabilitation (22 teeth; 15.49%), space maintainer (1 tooth; 0.70%), orthodontic movement (1 tooth; 0.70%) and tooth transplantation associated to endodontic treatment and the filling of the root canal with calcium hydroxide (1 tooth; 0.70%).

Post-traumatic complications

All teeth were followed up for 1 to 8 years. Follow-up radiographs revealed that 44 (36.97%) had inflammatory root resorption, 41 (34.45%), periodontal healing, 22 (18.49%), replacement root resorption, 2 (1.68%), pulp canal obliteration, and 1 (0.84%), internal inflammatory root resorption. Information about post-traumatic complication was not available for 9 teeth (7.56%).

Fifty-two teeth were followed up for 1 to 2 years and had the following results: periodontal healing (24 teeth; 46.15%); replacement root resorption (9 teeth; 17.31%), inflammatory root resorption (18 teeth; 34.62%) and pulp canal obliteration (1 tooth; 1.92%). Eleven teeth were followed up for 2 to 3 years and had the following results: periodontal healing (1 tooth; 9.09%); replacement root resorption (5 teeth; 45.45%), inflammatory root resorption (3 teeth; 27.27%), pulp canal obliteration (1 tooth; 9.09%), and internal inflammatory root resorption (1 tooth; 9.09%). Thirty-three were followed up for more than 3 years and had the following results: periodontal healing (8 teeth; 24.24%); replacement root resorption (8 teeth; 24.24%) and inflammatory root resorption (16 teeth; 51.52%).

Follow-up time and post-traumatic complications were not analyzed for 14 teeth (12.73%) because patients moved from town and missed their scheduled appointment or simply dropped out of treatment.

Discussion

Clinical factors and epidemiological outcomes of TDI should be known because of their important implications, such as root resorption and pulp changes. Epidemiologically, our results are in agreement with previously reported data about tooth avulsion (7, 8, 20, 25, 26). The data collected confirmed that male patients had significantly more tooth avulsion than female patients (2.5:1). However, recent studies have shown a reduction or even a reversal in this sex disparity (5, 21, 27). In general and in comparison with women, men engage in more vigorous physical activities, such as physical

contact sports, usually without wearing adequate protection, and in aggressive activities, such as fights (1, 3).

Tooth avulsion is more frequent in patients aged 7 to 14 years (1). In this study, the age of patients that had tooth avulsion ranged from 6 to 43 years. The highest prevalence was found in the 6 to 10 and 11 to 15 years age groups, which together made up about 61% of the sample. Zhang & Gong (8) found the highest frequency of tooth avulsion in the 7 to 17 years group (35.22%), but Panzarini et al. (20), in the 10 to 19 years group (53.24%). Odoi et al. (28) analyzed the association between problem behavior and TDI amongst children aged 7-15 years. Children who had peer relationship problems, such as being picked on or bullied by other children, were more likely to have TDI.

The most frequent causes of tooth avulsion were non-intentional, such as falls (51.76%) and traffic accidents (29.41%). Etiological factors varied according to age group. Most tooth avulsions due to falls were found in the 6-10 and 11-15 years groups. As age increased, traffic accidents became the main etiological agent, as reported elsewhere (29). The place where the study was conducted and the age group should be taken into account when analyzing injury etiology (8, 26).

Maxillary central incisors were the teeth most often affected, as previously reported (5-8). The vulnerable position of this teeth, which may often be protracted and have inadequate lip coverage, may explain this result (3).

One hundred and eleven patients (65.29%) had only one tooth avulsed. Some individuals had 3, 4 or even 6 avulsed teeth. Previous studies confirmed that most injuries involve multiple teeth (9). The number of avulsed teeth seems to vary according to etiology. Therefore, traumatic injuries due to traffic

accidents may result in a greater number of avulsed teeth (30). Additional damage may be associated with avulsion, such as dental hard tissue injury. In 31 replanted teeth (26.05%), there was additional crown damage, of which 70.97% were uncomplicated crown fractures. Donaldson & Kinirons (6) detected an increased risk of earlier root resorption onset for teeth with additional coronal damage at the time of replantation.

The analysis of the stage of root development revealed that 39/119 replanted teeth (32.77%) had incomplete root formation. This prevalence is similar to those found by Gonda et al. (27) (31.03%), Barret & Kenny (10) (38.46%) and Stewart et al. (21) (28.78%), higher than the one recorded by Andreasen et al. (22) (15.07%) and lower than the one found by Petrovic et al. (26) (48.38%). Schatz et al. (31) conducted a clinical and radiological study and found that most avulsed teeth had fully developed roots with an open apex. However, the outcomes of the studies that used different age groups should be compared carefully because some variation between dental age and biological age may be expected (32).

The stage of root development may be a predictor of periodontal and pulp healing, and the diameter of the apical foramen is directly associated with the chance of pulp revascularization (33). Although Ebeleseder et al. (14) found more cases of pulp revascularization in teeth with incomplete root formation, Petrovic et al. (26) diagnosed significantly more complications in teeth with that characteristic. Higher failure rates in the treatment of avulsed teeth with open apex were also found by Andreasen et al. (21) and Barret & Kenny (10).

The treatment of choice for avulsed teeth should be the replantation, even when the prognosis is unclear. Our study found a low replantation rate

(45.59%), which is in agreement with the rate reported by Kinoshita et al. (34) in Japan (43.75%), Tzigkounakis et al. (7) in Czech Republic (30%) and Petrovic et al. (26) in Serbia (48.38%). Panzarini et al. (20) in Brazil and Zhang & Gong (8) in China found higher replantation rates: 70.13% and 70.83%. The main reasons for no replantation are the fact that people at the accident site had insufficient knowledge about how to manage an avulsed tooth or reacted inappropriately, the teeth were not found, the patient sought dental treatment long after avulsion, or the patient was hospitalized to treat more serious injuries (7, 8, 20).

One of the most critical factors to preserve the periodontal ligament of avulsed teeth is the type of transport medium (22, 35). Pohl et al. (36) evaluated the healing results of 28 avulsed and replanted permanent teeth. The periodontal ligament of six avulsed teeth stored in a cell culture medium for 1-53 h was described as not compromised. Sixteen teeth were stored in non-physiological conditions temporarily, and their periodontal ligament was compromised. Other 6 teeth were stored in non-physiological conditions for longer times, and the condition of the periodontal ligament was defined as hopeless. Chappuis & von Arx (37) conducted a 1-year follow-up study of 45 avulsed permanent teeth and found a higher occurrence of replacement resorption in teeth kept for extended times in dry storage. Replacement resorption ranged from 9.5% in teeth kept in dry storage for a short time (less than 15 min) to 100% in teeth kept in dry storage for over 60 min.

Many patients in our study did not keep the avulsed tooth under physiological conditions, and 38/119 replanted teeth were kept in dry storage

before replantation. A possible explanation for this finding is that the patients in the study did not know how to store the avulsed tooth.

Avulsed teeth are usually replanted between 1 and more than 5 h after avulsion (7, 8, 20, 27). Boyd et al. (5) found that total extra-oral time was the best predictor of inflammatory root resorption. In our study, 89.08% of the teeth received delayed replantation.

Complications after replantation of avulsed teeth are common, at a reported prevalence of 57-83% (31, 38). The overall prevalence of complications was lower (57.98%) in our study than in those conducted by Schatz et al. (31) (83.3%) and Petrovic et al (26) (84.4%). IRR was the most common type and much more prevalent than RRR (36.97% and 18.49%). Several factors might have contributed to this unfavorable outcome, such as the significant proportion of avulsed teeth stored in a non-physiological medium and the long extra-alveolar storage time. IRR is associated with pulp infection and may be prevented or treated using proper endodontic treatment. Future studies based on new diagnostic methods and more powerful research tools (39, 40) are needed to evaluate the efficacy of the therapeutic protocols and their implications over time.

According to published guidelines for management of tooth avulsion (41, 42), the clinical decision to perform endodontic treatment should be based on the stage of root development and the extra-alveolar time. For the replanted teeth in our study, the most common management strategies were endodontic treatment and temporary filling of the root canal with calcium hydroxide and endodontic treatment and definitive root canal filling (85.71%).

The lack of epidemiological data about permanent tooth avulsion in the several geographical regions of Brazil has motivated this study. This retrospective study was conducted to describe tooth avulsion in Goiânia, a city in Midwestern Brazil. Moreover, oral health initiatives should be based on prevalence data and clinical factors to implement adequate policies. This study data suggest the establishment of accurate prevention policies to promote guidelines for the proper management of tooth avulsion. Epidemiological surveys support decisions about public health, and preventive campaigns have lower costs than the treatment of TDI (43-45). The most serious problems detected in this study were the low number of replanted teeth, the use of inappropriate storage medium to transport avulsed teeth and the prolonged extra-oral time.

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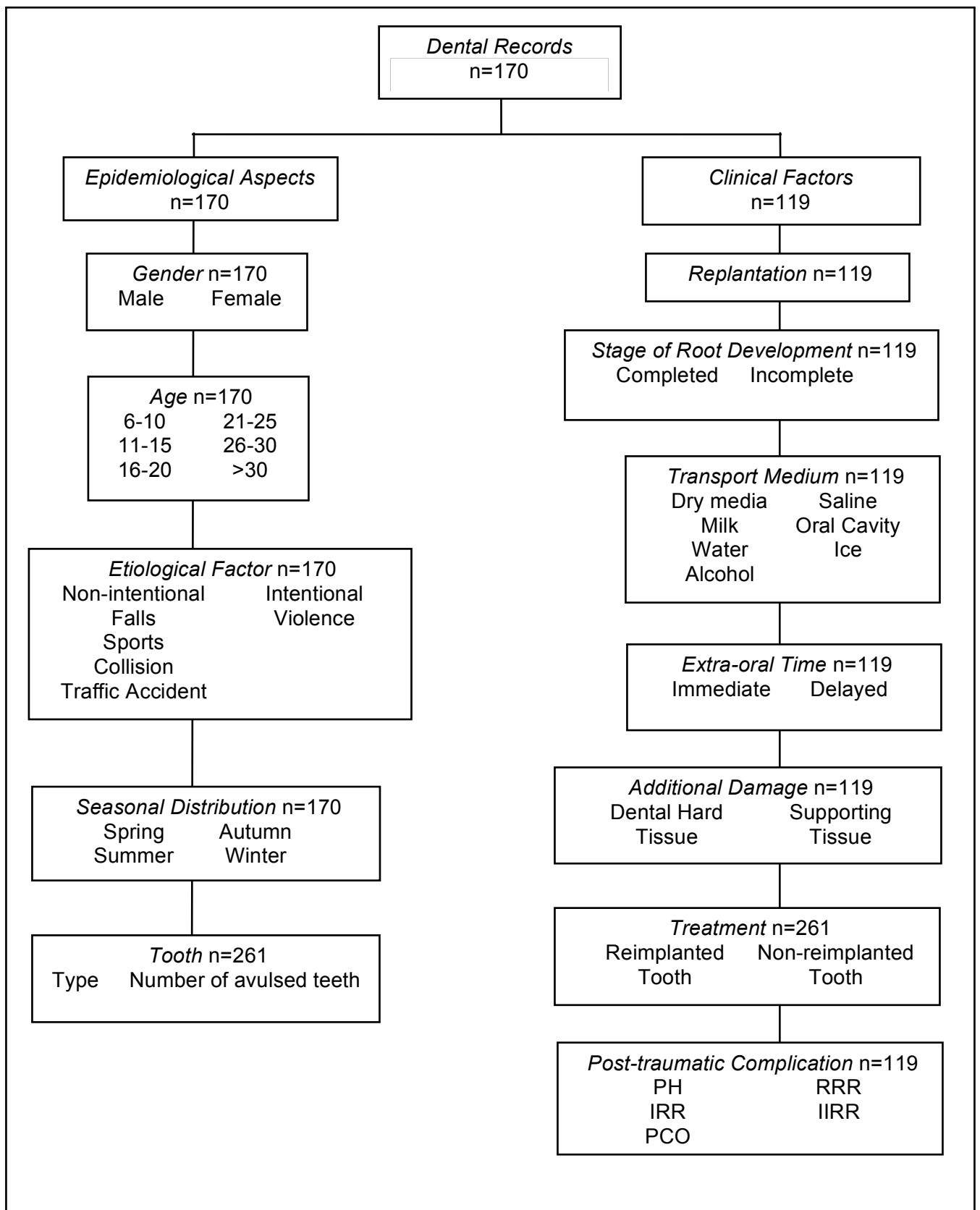


Figure 1.

Figure 2.

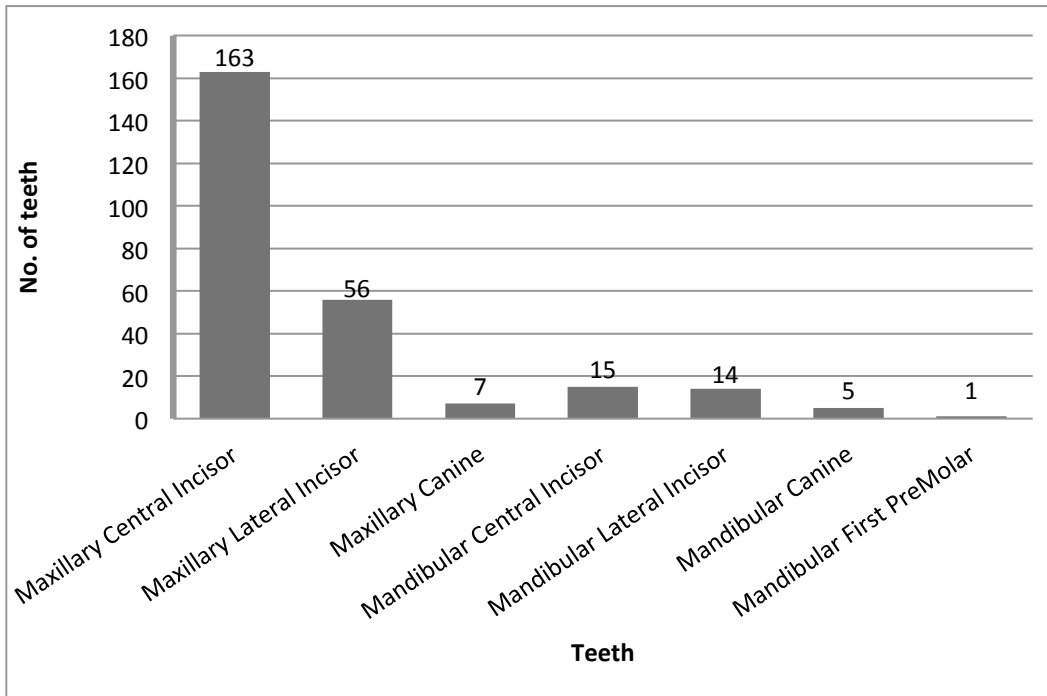


Figure legends

Figure 1. Data collected from patient charts and radiographs.

Figure 2. Distribution of avulsed permanent teeth according to tooth type.

Table 1. Distribution of the etiological factors of the tooth avulsion according to age and gender

	Fall (%)	Traffic accidents (%)	Sports injuries (%)	Violence (%)	Collision (%)	Others (%)	Total (%)
Age (n=170)							
6-10	39 (22.94%)	7 (4.12%)	1 (0.59%)	0 (0.00%)	2 (1.18%)	3 (1.76%)	52 (30.59%)
11-15	31 (18.24%)	15 (8.82%)	2 (1.18%)	3 (1.76%)	0 (0.00%)	1 (0.59%)	52 (30.59%)
16-20	9 (5.29%)	10 (5.88%)	1 (0.59%)	5 (2.94%)	1 (0.59%)	1 (0.59%)	27 (15.88%)
21-25	6 (3.53%)	7 (4.12%)	0 (0.00%)	1 (0.59%)	0 (0.00%)	3 (1.76%)	17 (10.00%)
26-30	2 (1.18%)	7 (4.12%)	0 (0.00%)	1 (0.59%)	1 (0.59%)	1 (0.59%)	12 (7.07%)
> 30	1 (0.59%)	4 (2.35%)	0 (0.00%)	1 (0.59%)	1 (0.59%)	3 (1.76%)	10 (5.88%)
Gender (n=170)							
Male	63 (37.06%)	35 (20.59%)	4 (2.35%)	9 (5.29%)	5 (2.94%)	5 (2.94%)	121 (71.17%)
Female	25 (14.71%)	15 (8.82%)	0 (0.00%)	2 (1.18%)	0 (0.00%)	7 (4.12%)	49 (28.83%)

9 ANEXOS

Anexo 1. Parecer do Comitê de Ética



PROTOCOLO CEPMHA/HC/UFG Nº 055/2005

Goiânia, 30/06/2005

INVESTIGADOR RESPONSÁVEL:

Profª Ana Helena Gonçalves de Alencar – Orientadora

Cláudia Daniela Moreira Portilho - Orientanda

TÍTULO: “Levantamento epidemiológico dos traumatismos alvéolo-dentários da cidade de Goiânia”.

Area Temática: Grupo III

Local de Realização: HC/UFG – Depto. de Odontologia e Buco-Maxilo-Facial

Senhor (a) Pesquisador (a),

Informamos que após **apreciação**, o Comitê de Ética em Pesquisa Médica Humana e Animal **aprovou o projeto de Pesquisa** acima referido, e este foi considerado em acordo com os princípios éticos vigentes.

- Informamos que não há necessidade de aguardar o parecer da CONEP – Comissão Nacional de Ética em Pesquisa para iniciar a pesquisa.
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Prof. Joffre Rezende Filho
Coordenador do CEPMHA/HC/UFG

Anexo 2. Publicações no biênio 2010/2011

Artigos científicos publicados em periódicos nacionais e internacionais, com corpo editorial:

- 1) Veloso HHP, Sampaio FC, Guedes OA. Tratamento interdisciplinar de dente permanente avulsionado em paciente com crescimento facial incompleto. *Dental Press Endod.* 2011 Oct-Dec;1(3):65-70.
- 2) Estrela C, Guedes AO, Silva JA, Leles CR, Estrela CRA, Pécora JD. Diagnostic and clinical factors associated with pulpal and periapical pain. *Braz Dent J* 2011; 22: 306-11.
- 3) Guedes OA, Rabelo LEG, Porto OCL, Alencar AHG, Estrela C. Avaliação radiográfica da posição e forma do forame mental em uma subpopulação Brasileira. *Robrac* 2011; 20: 160-5.
- 4) Guedes OA, Alencar AHG, Lopes LG, Pécora JD, Estrela C. A retrospective study of Traumatic Dental Injuries in a Brazilian dental urgency service. *Braz Dent J* 2010; 21: 153-7.
- 5) Pereira Júnior W, Moura MS, Guedes OA, Decurcio RA, Estrela C. Análise de critérios de sucesso em endodontia e implantodontia. *ROBRAC* 2010; 19: 108-18.
- 6) Valladares-Neto J, Estrela C, Bueno MR, Guedes OA, Porto OCL, Pécora JD. Mandibular condyle dimensional changes in subjects from 3 to 20 years of age using Cone-Beam Computed Tomography: a preliminary study. *Dent Press J Orthodont* 2010; 15: 172-81.
- 7) Estrela C, Valladares-Neto J, Bueno MR, Guedes OA, Porto OCL, Pécora JD. Linear measurements of human permanent dental development stages using Cone-Beam Computed Tomography: a preliminary study. *Dent Press J Orthodont* 2010; 15: 44-78.

Artigos científicos aceitos para publicação em periódicos nacionais e internacionais, com corpo editorial:

- 1) Borges RN, Arantes BM, Vieira DF, Guedes OA, Estrela C. Occlusal adjustment in the treatment of primary traumatic injury. *Stomatos* (in press).
- 2) Borges RN, Arantes BM, Vieira DF, Guedes OA, Estrela C. Occlusal adjustment in the treatment of secondary traumatic injury. *Stomatos* (in press).

Livro(s), organização de livro(s) e capítulo(s) de livro:

- 1) Estrela C, Sydney GB, Guedes OA, Figueiredo JAP. Protocolo de sucesso no tratamento endodôntico. In: Cláudio Pinheiro Fernandes. (Org.). *Uma odontologia de classe mundial*. 1 ed. São Paulo-SP: Editora Santos, 2010, v. 1, p. 59-88.
- 2) Estrela C, Sydney GB, Guedes OA, Figueiredo JAP. Successful protocol for endodontic treatment. In: Cláudio Pinheiro Fernandes. (Org.). *A world class dentistry*. 1 ed. São Paulo-SP: Editora Santos, 2010, v. 1, p. 59-86.

Anexo 3. Normas de publicação do periódico

Dental Traumatology

Official Publication of the International Association for Dental Traumatology and the International Academy of Sports Dentistry

Edited by:

Lars Andersson

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Top Author Guidelines

Content of Author Guidelines: 1. General, 2. Ethical Guidelines, 3. Submission of Manuscripts, 4. Manuscript Types Accepted, 5. Manuscript Format and Structure, 6. After Acceptance

Relevant Documents: Copyright Transfer Agreement

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1. GENERAL

Dental Traumatology is an international journal which aims to convey scientific and clinical progress in all areas related to adult and pediatric dental traumatology. It aims to promote communication among clinicians, educators, researchers, administrators and others interested in dental traumatology. The journal publishes original scientific articles, review articles in the form of comprehensive reviews or mini reviews of a smaller area, short communication about clinical methods and techniques and case reports. The journal focuses on the following areas related to dental trauma:

Epidemiology and Social Aspects

Tissue, Periodontal, and Endodontic Considerations

Pediatrics and Orthodontics

Oral and Maxillofacial Surgery / Transplants/ Implants

Esthetics / Restorations / Prosthetics

Prevention and Sports Dentistry

Please read the instructions below carefully for details on the submission of manuscripts, the journal's requirements and standards as well as information concerning the procedure after a manuscript has been accepted for publication in

Dental Traumatology. Authors are encouraged to visit Wiley-Blackwell Author Services for further information on the preparation and submission of articles and figures.

2. ETHICAL GUIDELINES

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Authors submitting a paper do so on the understanding that the manuscript have been read and approved by all authors and that all authors agree to the submission of the manuscript to the Journal. ALL named authors must have made an active contribution to the conception and design and/or analysis and interpretation of the data and/or the drafting of the paper and ALL must have critically reviewed its content and have approved the final version submitted for publication. Participation solely in the acquisition of funding or the collection of data does not justify authorship.

Dental Traumatology adheres to the definition of authorship set up by The International Committee of Medical Journal Editors (ICMJE). According to the ICMJE authorship criteria should be based on 1) substantial contributions to conception and design of, 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. Authors should meet conditions 1, 2 and 3.

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Experimentation involving human subjects will only be published if such research has been conducted in full accordance with ethical principles, including the World Medical Association Declaration (version, 2008 <http://www.wma.net/en/30publications/10policies/b3/index.html>) and the additional requirements, if any, of the country where the research has been carried out. Manuscripts must be accompanied by a statement that the experiments were undertaken with the understanding and written consent of each subject and according to the above mentioned principles. A statement regarding the fact that the study has been independently reviewed and approved by an ethical board should also be included. In the online submission process we also require that all authors submitting manuscripts to Dental Traumatology online must answer in the affirmative to a statement 'confirming that all research has been carried out in accordance with legal requirements of the study country such as approval of ethical committees for human

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- Launch your web browser (supported browsers include Internet Explorer 6 or higher, Netscape 7.0, 7.1, or 7.2, Safari 1.2.4, or Firefox 1.0.4) and go to the journal's online Submission Site: <http://mc.manuscriptcentral.com/dt>
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 - After clicking on 'Create Account', enter your name and e-mail information and click 'Next'. Your e-mail information is very important.
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 - Enter a user ID and password of your choice (we recommend using your e-mail address as your user ID), and then select your area of expertise. Click 'Finish'.
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 - The title page, Acknowledgements and Conflict of Interest Statement where applicable, should be uploaded under the file designation 'title page'

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All manuscripts submitted to Dental Traumatology will be reviewed by two experts in the field. Dental Traumatology uses double blinded review. The names of the reviewers will thus not be disclosed to the author submitting a paper and the name(s) of the author(s) will not be disclosed to the reviewers.

To allow double blinded review, please submit (upload) your main manuscript and title page as separate files.

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All documents uploaded under the file designation 'title page' will not be viewable in the html and pdf format you are asked to review in the end of the submission process. The files viewable in the html and pdf format are the files available to the reviewer in the review process.

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Review Papers: Dental Traumatology commissions review papers of comprehensive areas and mini reviews of small areas. The journal also welcomes uninvited reviews. Reviews should be submitted via the online submission site and are subject to peer-review.

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Mini Reviews are covering a smaller area and may be written in a more free format.

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Case Reports illustrating unusual and clinically relevant observations are acceptable, but their merit needs to provide high priority for publication in the journal. They should be kept within 3-4 printed pages and need not follow the usual division into material and methods etc, but should have an abstract. The introduction should be kept short. Thereafter the case is described followed by a discussion.

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All papers submitted to Dental Traumatology should include: Title Page, Abstract, Main text, References and Tables, Figures, Figure Legends, Conflict of Interest Statement and Acknowledgements where appropriate. Title page, Conflict of Interest Statement and any Acknowledgements must be submitted as separate files and uploaded under the file designation Title Page to allow blinded review. Manuscripts must conform to the journal style. Manuscripts not complying with the journal style will be returned to the author(s).

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Main Text of Original Articles should be divided into Introduction, Material and Methods, Results and Discussion. During the editorial process reviewers and editors frequently need to refer to specific portions of the manuscript, which is difficult unless the pages are numbered. Authors should number all of the pages consecutively.

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Acknowledgements: Under acknowledgements please specify contributors to the article other than the authors accredited. Acknowledgements should be brief and should not include thanks to anonymous referees and editors.

Conflict of Interest Statement: All sources of institutional, private and corporate financial support for the work within the manuscript must be fully acknowledged, and any potential grant holders should be listed. The Conflict of Interest Statement should be included as a separate document uploaded under the file designation 'Title Page' to allow blinded review.

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As the Journal follows the Vancouver system for biomedical manuscripts, the author is referred to the publication of the International Committee of Medical Journal Editors: Uniform requirements for manuscripts submitted to biomedical journals. *Ann Int Med* 1997;126:36-47.

Number references consecutively in the order in which they are first mentioned in the text. Identify references in texts, tables, and legends by Arabic numerals (in parentheses). Use the style of the examples below, which are based on the format used by the US National Library of Medicine in Index Medicus. For abbreviations of journals, consult the 'List of the Journals Indexed' printed annually in the January issue of Index Medicus.

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