

The following dentists and their staff participated in the Cracked Tooth Survey:

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Barry Evans, D.M.D.
Katherine Farrell, D.M.D.
Gary Genzer, D.M.D.
Robert Grew, D.M.D.
Lillian Harewood, D.M.D.
Brock Herriges, D.M.D.
Steven Hokett, D.D.S.
Fay Gyapong Holman, D.M.D.
Mark Jensen, D.M.D.
Richard Knight, D.M.D.
Dan Laizure, D.M.D.
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Bradley Marineau, D.M.D.
Jean Martin, D.D.S., M.P.H.
Melvin Matsuda, D.D.S.
John McComb, D.M.D.
George McCully, D.M.D.
Steven Murata, D.M.D.
Michael Naughton, D.M.D.
Scott Nicholson, D.M.D.
Jill Price, D.M.D.
Robert Rose, D.M.D.
Eugene Sakai, D.M.D.
Mehdi Salari, D.M.D.
Shane Samy, D.M.D.
Daniel Saucy, D.M.D.
Ronald Selis, D.M.D.
Steve Simmons, D.M.D.
Ryan Sparks, D.M.D.
Frances Sunseri, D.M.D.
Steven Timm, D.M.D.
Scott Travelstead, D.M.D.
Ronald Trotman, D.M.D.
Sue Walker, D.M.D.
Tom Walker, D.M.D.
Albert Wedam, D.M.D.
Karen Weliky, D.M.D.
Kimberly Wright, D.M.D.
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Cracked Tooth Study

48 PROH Practices Participate in Cracked Tooth Survey



After two years of getting organized, putting infrastructure into place, recruiting participating practices and getting dentists trained, the Practice-based Research in Oral Health (PROH) network completed its first study. In PROH's first two annual conferences, a lot of interest was expressed in various clinical concerns regarding cracked teeth. The purpose of this practice-based study was to obtain baseline data on cracked teeth through a brief survey that we hope will serve as a foundation for further study.

Methods: Practitioners (in PROH) were asked to complete a scannable survey on 50 randomly selected patients. The survey was designed to obtain information regarding the following on first and second molars of adult patients: presence/absence of cracks, surfaces with cracks, restoration type, restoration surfaces, crack connected with restoration, wear, and tooth sensitivity. Descriptive statistics were performed on all variables and presented as frequencies and percentages for categorical variables. Data was analyzed with logistic regression, univariate and multivariate analysis, using Bonferroni correction for multiple comparisons ($p \leq 0.05$)

Results: A total of 14,346 molars were analyzed with the following distribution of restorations: amalgam (46%), gold (27%), none (11%), composite (10%), glass ionomer (9%), ceramic (1%). Ten percent of the teeth studied were sensitive to temperature and/or biting. When a tooth had a crack, it was most often on the lingual surface (33%), followed by facial (22%), distal (22%), mesial (14%), and occlusal (9%). Of all tooth surfaces analyzed, 10% of lingual surfaces had a crack, followed by facial (7%), distal (7%), mesial (4%), occlusal (3%). When

a tooth was restored, the number of restored surfaces was 1(20%), 2(20%), 3 (12%), 4(6%), 5(32%). The odds ratio of a crack in a tooth by restoration type vs. no restoration were: amalgam (7.7, i.e. a tooth with an amalgam restoration was 7.7 times more likely to have a crack than a tooth with no restoration), composite (4.0), ceramic (0.42), gold (0.34). The reason for the teeth restored with ceramic (which included PFM restorations) or gold having less chance of exhibiting a crack versus a tooth with no restoration was most likely due to these teeth being restored with crowns. A tooth exhibiting moderate wear was 1.8 times and a tooth with severe wear was 2.2 times more likely to have a crack than a tooth with no wear.

Conclusions: Restored and worn teeth had cracks more often than non-restored and non-worn teeth. While no cause and effect relationship can be inferred from these results, teeth restored with amalgam and composite had a significantly higher incidence of cracks than teeth with no restorations.

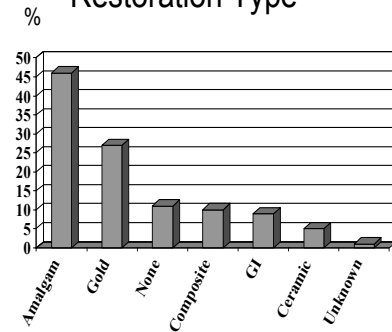
Presentation/Publication: This study has been accepted for presentation at the March 2007 annual meeting of the International Association for Dental Research and it will be submitted for full-length publication to appropriate journals.

Costs: Research is expensive. This was a simple study, expenses were limited, and no salary support or investigator reimbursement was provided. Despite this, the study still incurred costs of \$6,770 (printing, data scanning, statistical analysis, etc.) which was absorbed by PROH. This is a great example of how important it is to obtain outside sources to fund PROH studies.

Results

- Patient demographics:
 - Mean age: 49 ± 16
 - Male: 44%, Female: 56%
 - Total valid surveys: 1,962
 - Total teeth analyzed: 14,346
 - Total sensitive teeth: 192
 - Total dentists who participated: 48

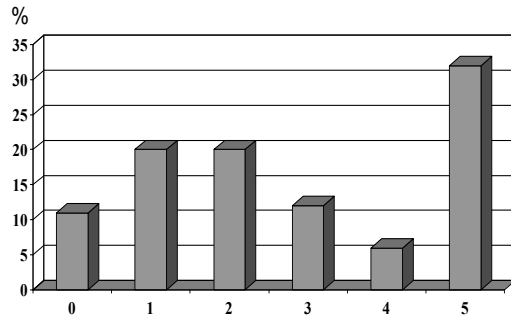
Results Restoration Type



Note: Percentage of study teeth with NO restorations = 11%

Results

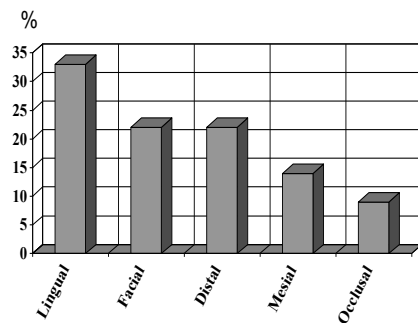
Number of Surfaces Restored



The percentage of teeth with the noted number of surfaces restored.

Results

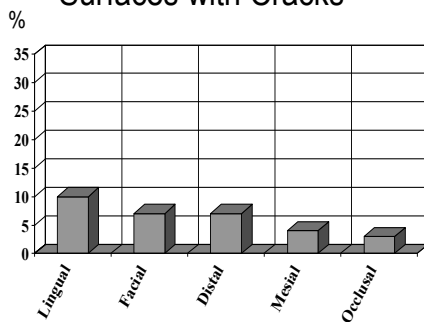
Surfaces with Cracks



When a tooth had a crack, on what surface did it occur?

Results

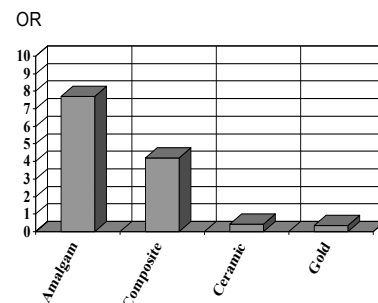
Surfaces with Cracks



What percentage of the time did a particular surface have a crack?

Results

Odds Ratio (OR): Risk of Crack by Restoration Type (vs. No restoration)



NB: This does not imply a cause and effect relationship, i.e. because there is a higher risk of cracks in teeth with amalgam restorations, it does not mean that amalgam caused the cracks. The cracks could be due to preparation factors, undermined tooth structure, residual or secondary caries, etc.