Morphological changes in dental pulp after the teeth preparation procedure.

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Abstract

The aim of this study was to evaluate the immediate changes in the pulp-dentin complex that result from crown preparation, and their correlation with the thickness of remaining dentin and the preparation technique (with or without water spray cooling). Thirty upper intact premolars scheduled for extraction for orthodontic reasons were high speed prepared, extracted immediately after preparation and divided in 5 groups. The analysis of the pulp morphology demonstrated that there are several differences according with the preparation technique. The most severe changes appear after the profound preparation without water-cooling, the odontoblastic layer being extremely affected. Also, vascular reactions and inflammatory infiltrate (in the absence of bacteria) were present. Our study revealed that the histologic changes in the pulp and dentin following complete crown preparation occur anyway and they are considered difficult to avoid, even if an adequate technique of preparation is used.

→ Artikel frei einsehbar unter:

Pulp reactions to different preparation techniques on teeth exhibiting periodontal disease.

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Abstract

To evaluate the histopathological outcome of two preparation techniques (featheredge preparation/shoulder preparation) on teeth exhibiting pulp reactions due to age and periodontal disease, 11 teeth were prepared for full veneer crowns. Laboratory made resin crowns were fixed with a zinc phosphate cement for a period of 90 days. After extraction, adjacent pulpal areas were histopathologically rated according to the BRD criteria comprising the parameters (i) Bacterial invasion, (ii) Regenerative parameters, (iii) Degenerative
Degenerative reactions were more correlated with tooth preparation than with advanced periodontal disease. The severity of endodontal reactions depends more on remaining dentin thickness than on the type of preparation.

**Assessment of the periapical and clinical status of crowned teeth over 25 years.**

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**Abstract**

OBJECTIVES: The purpose of this study was to examine radiographically changes in the periapical status and compare the clinical status of teeth with a vital pulp and root-filled teeth restored with crowns and bridge retainers during 25 years.

METHODS: During 1967/68, 114 patients received prosthodontic treatment by senior dental students at the Oslo Dental Faculty. In all, 291 teeth with a vital pulp and 106 root-filled teeth were restored with 158 prostheses. All root-filled teeth were restored with a cast dowel and core. The casts were made in a type-3 gold alloy, and cemented with zinc phosphate cement. Forty-six teeth were restored with crowns and 351 teeth with bridge retainers. Radiographs were taken preoperatively, immediately after cementation, and every fifth year. Two independent observers assessed the periapical status on the radiographs according to the PAI-index. At the 25 years examination, 32 patients (28%) with 101 restored teeth (24%) remained in the study. Survival rates of the prostheses and of the restored teeth were estimated using Kaplan-Meyer non-parametric statistics.

RESULTS: The PAI-score of the periapical status deteriorated in 13 vital and four root-filled teeth. The survival rates of the fixed prostheses were not influenced by the pulp vitality of the restored tooth at the baseline. The survival rates of the restored teeth with a vital pulp and of the root-filled teeth were similar. Clinical failures were recorded on approximately one-third of the restored teeth. The main reason for tooth failure was caries (12%), and for the teeth with a vital pulp also pulpal deterioration (10%). Estimates of the proportions of crowned teeth with a vital pulp that will remain free from signs and symptoms of pulpal deterioration were 98% after five years, 92% after 10 years, 87% after 20 years and 83% after 25 years.

CONCLUSIONS: The incidence of periapical lesions on radiographs of crowned teeth was low during 25 years observation. Crowned, root-filled teeth with a high quality endodontic treatment and an optimal morphology of the dowel and core have a similar survival rate as crowned teeth with a vital pulp. A high proportion of crowned teeth with a vital pulp will remain free from signs and symptoms of pulpal deterioration over 25 years.
A retrospective study of pulpal response in vital adult teeth prepared for complete coverage restorations at ultrahigh speed using only air coolant.

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Abstract

STATEMENT OF PROBLEM: The dental literature has shown a 3% to 25% pulpal necrosis rate as a result of tooth preparation for complete coverage restorations.

PURPOSE: The purpose of this retrospective study was to examine clinical and radiographic records for evidence of pulpal necrosis in teeth prepared for complete coverage restorations at ultrahigh speed when air coolant alone was used.

MATERIAL AND METHODS: The 1847 teeth in this study (182 fixed partial denture abutment teeth and 1665 single teeth restored with 21 all-ceramic, 1095 metal-ceramic, and 731 all-metal restorations) were prepared with diamond instruments (burs) in a sweeping or painting motion with the use of light pressure (1-3 oz) at ultrahigh speed with air coolant alone from the handpiece. New burs were used for each patient and then discarded. Each bur was used on no more than 4 teeth. All impressions were made with reversible hydrocolloid. Provisional restorations were fabricated on a stone cast and cemented with zinc oxide and eugenol cement. Provisional restorations were removed at 3 to 4 weeks and definitive restorations placed. Between 1970 and 1989, 6 different luting agents (zinc phosphate, resin, glass ionomer, ortho-ethoxybenzoic acid, carboxylate, and polycarboxylate) were used to place definitive restorations. All patients were questioned about symptoms of tooth sensitivity, tenderness, or pain at their regular (4- to 6-month) hygiene recall appointments. Success was defined as any definitively restored teeth that remained free of radiographic evidence of periapical radiolucency and clinical signs and symptoms of pulpal sensitivity or pain recorded in the clinical record. The results were compared with rates of pulpal necrosis for teeth prepared with water coolant as reported in the dental literature published between 1970 and 1997.

RESULTS: Of 638 teeth prepared between 1970 and 1979, the pulpal necrosis rate was 2.19% (14 teeth: 12 single teeth and 2 fixed partial denture abutment teeth) (97.81% success rate). Of 1209 teeth prepared between 1980 and 1989, the pulpal necrosis rate was 0.66% (8 teeth: 7 single crown teeth and 1 partial denture abutment tooth) (99.34% success rate). Of 1825 teeth prepared between 1970 and 1989, radiographic evidence of pulpal necrosis was found in 0% (100% success rate). No clinical symptoms of pain or sensitivity were recorded in the patient records for the surviving teeth during the time period of this study, which was conducted in May 2001. No crowns were repaired or removed as a result of carious lesions. No higher incidence of pulpal necrosis relative to the type of luting agent was observed.

CONCLUSION: Within the limitations of this retrospective study, it is suggested that tooth reduction procedures can be completed with minimal damage to the pulp when only air coolant from the dental handpiece is used.
Reducing the risk of sensitivity and pulpal complications after the placement of crowns and fixed partial dentures.

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Abstract
Sensitivity after cementation of a crown with glass-ionomer cement is often attributed to an adverse effect on the pulp by the luting agent. Most permanent restorative materials in common use today do not tend to irritate the pulp; the main cause of pulpal damage is infection, the bacteria originating in the smear layer or deep in the dental tubules, inaccessible to caries-excavating procedures. A poorly fitting provisional crown may expose cut dentin to the oral fluids, and mechanical trauma caused by frictional heat during preparation may also damage the pulp. The following precautions are recommended during precementation procedures to reduce the risk of an inflammatory response in the pulp:

(1) The provisional crown should be well fitting, covering cervical dentin but not impinging on the periodontal tissues. The permanent crown should be cemented as soon as possible.

(2) The superficial smear layer should be removed and the dentinal surface should be treated with an antibacterial solution before the provisional crown is placed.

(3) To decrease dentinal permeability under the provisional crown, the dentinal surface should be covered with a liner that can be easily removed before final cementation.

(4) To ensure optimal micromechanical bonding, the dentinal surface should be thoroughly cleaned, and the dentin should be kept moist until cementation.

(5) The occlusion should be carefully checked before cementation of the crown.

Pulpal evaluation of teeth restored with fixed prostheses.

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Abstract
The literature demonstrates that each of the elements of crown fabrication involves possible and probable insult to the pulpal tissues of the tooth. Preparation of the tooth can result in pulpal inflammation or even burn lesions. The impression technique can result in reduction of the odontoblastic layer caused by drying of the dentin. Temporary coverage of the preparation involves the use of self-curing resins and temporary cements, both of which can irritate the pulp. The final restoration is attached with cements that are often implicated in pulpal irritation. Dental caries and the procedures necessary to remove it and restore the tooth before preparation for a fixed prosthesis can injure the pulp. This study was done to
evaluate the effects of complete coverage fixed prosthetic restorations on the dental pulp. A recall letter was mailed to 1221 patients who had received a fixed partial denture or single crown during the years 1984-1988. One hundred thirty patients were examined. Each tooth was evaluated for pulpal health, periodontal integrity, and clinical acceptability of the restoration. Of the 603 teeth examined, 166 had undergone root canal therapy before placement of the restoration, leaving 437 that were crowned while vital. Of these, 25 (5.7%) were in need of root canal therapy or had undergone root canal therapy after cementation of the fixed prosthesis.