Fourier-transform infrared spectroscopy (FTIR) of remaining dentine after caries removal with newly prepared experimental chemomechanical caries removal agent

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**Aim:** The aim of this study was to determine the chemical characteristic of remaining dentine after caries removal with either experimental chemomechanical caries removal agent (ECMCRA) or Carisolv®

**Materials & Methods:** Twenty extracted human third molars were embedded individually in slow curing epoxy resin; the teeth were decoronated and ground flat the occlusal surfaces. A 280 ± 20 µm thick layer of partially demineralized dentine was created on the occlusal dentine surface by pH cycling. After that, the teeth distributed to two groups and sectioned longitudinally. The first half caries was excavated and a thin layer of dentine was gently scraped off with surgical scalpel blade and subjected to FTIR analysis which is considered as a remaining dentine without any CMCR agents. The second halves were obtained after carious tissues removal with either ECMCRA or Carisolv (MediTeam Dental. Sweden) respectively according to the manufactures instructions and this is considered as a remaining dentine after caries removal with agents. The FTIR spectra of each sample were obtained by ALPHA FTIR spectrometers (Bruker, Germany) with 4.0 cm resolution, with the range of 500-4000 cm. To evaluate the integrity of the collagen triple helix, peak absorbance ratios of 1235 cm /1454 cm were considered.

**Results:** No disappearance or shift of bands was evident with regard to the mineral and organic content of remaining dentine. ECMCRA did not promote collagen denaturation.

**Conclusion:** The chemical analyses in the present study for the remaining dentine after caries removal with either ECMCRA or Carisolv imply that remaining dentine after removal with either methods of CMCR are insignificantly differ from control dentine.