

Incidence of pulp exposure after removal of deep carious lesions in permanent posterior teeth of adults: a randomized clinical trial comparing stepwise excavation vs. indirect pulp capping vs. complete excavation

K.M. Wijerathne^{1*}, R.L. Wijeyeweera² and P.M.H. Dummer³

¹*Department of Restorative Dentistry, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka,* ²*Department of Community Dental Health, Dental Health, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka,* ³*School of Dentistry, Cardiff University, Cardiff, UK*
**kmwijerathne@yahoo.com*

Avoiding pulp exposure in deep carious lesions that involve the inner third of dentine is beneficial, because it avoids costly and invasive endodontic treatments and allows teeth to be retained. The main strategies of caries removal range from, removing all affected (firm dentine, lathery dentine) and infected (soft dentine) dentine to leave only hard dentine to, not removing any carious dentine from the cavity. 1) Complete excavation (CE) aims to eliminate all affected and infected dentine to leave only sound dentine both on the peripheral walls and pulpal floor, 2) Indirect pulp capping (IPC) leaves firm dentine on the pulpal walls but retains some softened dentine on the cavity floor. 3) Stepwise excavation (SWE) is performed in two steps; the first step removes some soft dentine but excavates until hard dentine in the periphery and then restoring the cavity with a temporary filling material; after 3 to 12 months the tooth is restored permanently.

All new patients attending the diagnostic clinic, Faculty of Dental Sciences with restorable deep carious lesions in premolar and molar teeth were screened by one clinician and volunteers were selected on the basis of set inclusion and exclusion criteria. This randomized clinical trial was conducted using a computer-generated randomization list with three groups of single blind (patient) teeth from volunteers, to compare the effect of complete excavation vs indirect pulp capping vs stepwise excavation. The sample size was calculated using results of previous studies.

Odds ratio estimates revealed that indirect pulp capping and complete excavation had a greater probability of pulp exposure compared to the step wise excavation. Complete excavation had a greater chance of exposure compared to the step wise excavation.

It can be concluded that step wise excavation was the safest method of caries removal for deep lesions as it resulted in fewer pulp exposures.

Financial assistance given by Higher Education for the Twenty First Century Project (PDN/O-den/N3), University Grant Commission (UGC/ICD/RG2011) and Cardiff University is acknowledged.