

# Comparative Evaluation of MTA Pulpotomy and Laser-Assisted MTA Pulpotomy in Primary Teeth: A Randomized Clinical Trial

## Abstract

**Context and Aim:** Formocresol has been used as the material of choice (gold standard) for pulpotomy procedures because of the ease of use but was discouraged due to its potential immune sensitization and mutagenic effects. Laser irradiation was first applied for pulpotomy procedure in the year 1985. Recently, diode lasers have been used for pulpotomy in primary teeth and have shown clinical success rates comparable to formocresol. The present in-vivo study was carried out to compare the clinical and radiographic success rates of Mineral Trioxide Aggregate (MTA) alone and diode laser-MTA for pulpotomy in human primary molars.

**Materials and Methods:** The present study was a randomized clinical trial in design wherein forty primary teeth requiring pulpotomy treatment which met the selection criteria (clinical and radiographic) were divided into two groups, group 1 (n=20) wherein the pulpotomy was performed with MTA alone and group 2 (n=20) wherein laser-assisted pulpotomy was performed with MTA (L-MTA). The patients were recalled after 3, 6 and 9 months respectively and evaluated clinically and radiographically.

**Statistical Analysis Used:** The data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 22 (IBM corporation, Washington DC, United States). Descriptive statistics were used to analyze the data while the Pearson's correlation coefficient test was used to analyze the statistical correlation between the overall success rates observed in the clinical and radiographic findings of both the groups.  $p < 0.05$  was considered statistically significant.

**Results:** The clinical success rate in the MTA group was 90%, 84.21% and 88.23% at 3, 6 and 9 months respectively with no clinical signs or symptoms reported at the said follow-up visits while the radiographic success rate was found to be 85%, 84.21%, and 82.3% respectively. On the contrary, the clinical success rate in the L-MTA group was found to be 95%, 94.74% and 94.44% at 3, 6 and 9 months respectively with the radiographic success rate reported being 90%, 89.47%, and 88.89% respectively.

**Conclusion:** The combination of diode laser and MTA yielded better clinical and radiographic success rates over the pulpotomy procedures done with the help of MTA alone.

**Keywords:** Culpotomy • diode lasers • MTA

Submitted: 04 March 2020; Accepted: 12 March 2020; Published online: 05 July 2020

## Introduction

The goals of an ideal pulpotomy procedure are removal of pulpal inflammation, maintenance of arch length and masticatory function. Formocresol has been used as the material of choice (gold

standard) for pulpotomy procedures because of the ease of use but was discouraged due to its potential immune sensitization and mutagenic effects [1]. Alternative medicaments like glutaraldehyde, ferric sulfate, Mineral Trioxide Aggregate (MTA), bone morphogenic proteins, dentin bonding agents,

Kranthi R Kumar<sup>1\*</sup>, Maneesha Das<sup>2</sup>, Gautam Singh<sup>3</sup>, Malu L Madhu<sup>4</sup>, Jeswin M Thomas<sup>5</sup>, Arumugam Esai Amutha Prabha<sup>5</sup>

<sup>1</sup>Department of Pediatric and Preventive Dentistry, Dr. Hedgewar Smruti Rugna Seva Mandal Dental College and Hospital, Hingoli, Maharashtra, India

<sup>2</sup>Department of Conservative Dentistry and Endodontics, Saraswati Dhanwantari Dental College and Hospital and Post-graduate Research Institute, Parbhani, Maharashtra, India

<sup>3</sup>Department of Conservative Dental Sciences, Ibn Sina National College for Medical Studies, Jeddah, Kingdom of Saudi Arabia

<sup>4</sup>Department of Pediatric and Preventive Dentistry, Azeezia College of Dental Sciences and Research, Kollam, Kerala, India

<sup>5</sup>Department of Pediatric and Preventive Dentistry, Rajas Dental College and Hospital, Kavalkinaru, Tirunelveli, Tamil Nadu, India

\*Author for correspondence: kranthikumarr@gmail.com