



COMPARISON OF WORKING TIME IN PLACEMENT OF CONVENTIONAL MATRIX VS PRE CONTOURED MATRIX

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INTRODUCTION

In clinical practice, obtaining physiologic proximal contact points is essential for protection of balance and harmony of the stomatognathic system. This study aimed at assessing the influence of different matricing techniques; either sectional matrix or circumferential matrix in undergraduate students. The development of a unique matrix armamentarium appropriate to non-condensing composite resin was a vital challenge. The consistent creation of optimum, anatomically correct proximal contacts can be unpredictable. Further, there is an increased demand for the superior aesthetics afforded by resin composite restorative materials; the competitive practitioner must, thus, develop the skills required to place multiple restorations in a single visit, without compromising the quality of the final restorations.(1) The primary function of a matrix (band) has been to compensate for missing walls and thus provide containment of the filling material. Reconstruction of proximal surface anatomy in dentistry has traditionally been achieved using some sort of matrix, which is defined as “that which contains and gives shape or form to anything.” A dental matrix band can be defined as “a properly shaped piece of metal, or other material, inserted to support and to give form to the restoration during placement and hardening of the restorative material,” with the re-creation of natural tooth shape and interproximal contact position as the ultimate objective. Traditionally, matrix bands were manufactured from thin, flexible, flat pieces of metal and were placed circumferentially around the affected tooth.(2)



Matrix systems can be categorized based on the type of band and technique of application. Qualifications for all matrix and retainer systems include stability on band insertion and exhibition of adequate style (flat and precontoured) and width (adequate thinness to account for the space taken by the restorative material) for the reconstruction of correct proximal contours and contact surfaces. Two types of common matrix systems available are circumferential and sectional matrix systems. Circumferential matrices are pre-contoured in three dimensions which, when combined with anatomical wedges and separators, result in tight contacts(3). The retainerless design tends to offer good comfort and visibility that quickens the quadrant work to offer proper adaptations. Sectional matrices improve the retention of the restoration between the teeth to be restored. They ensure good matrix band adaptation.(4) They are anatomically contoured which have a long shelf life. They are used where tooth form, function, and conservation of tooth structure are required. The Objective of this study was to evaluate the effects of two matrix band systems on the proximal contacts and contours while restoring two surface cavities by undergraduate students in posterior teeth. (5)Dental students commonly face the problem of overhanging proximal margins and unsatisfactory proximal contact points (PCPs) while restoring Class II cavities in posterior teeth(6). Various matrix band systems are used in dental clinics to avoid such problems. Aims: The aim of this study is to compare the effects of two matrix band systems, circumferential matrix system and sectional matrix system on the PCPs and contours when restoring Class II cavities in posterior teeth.

MATERIALS AND METHODS:

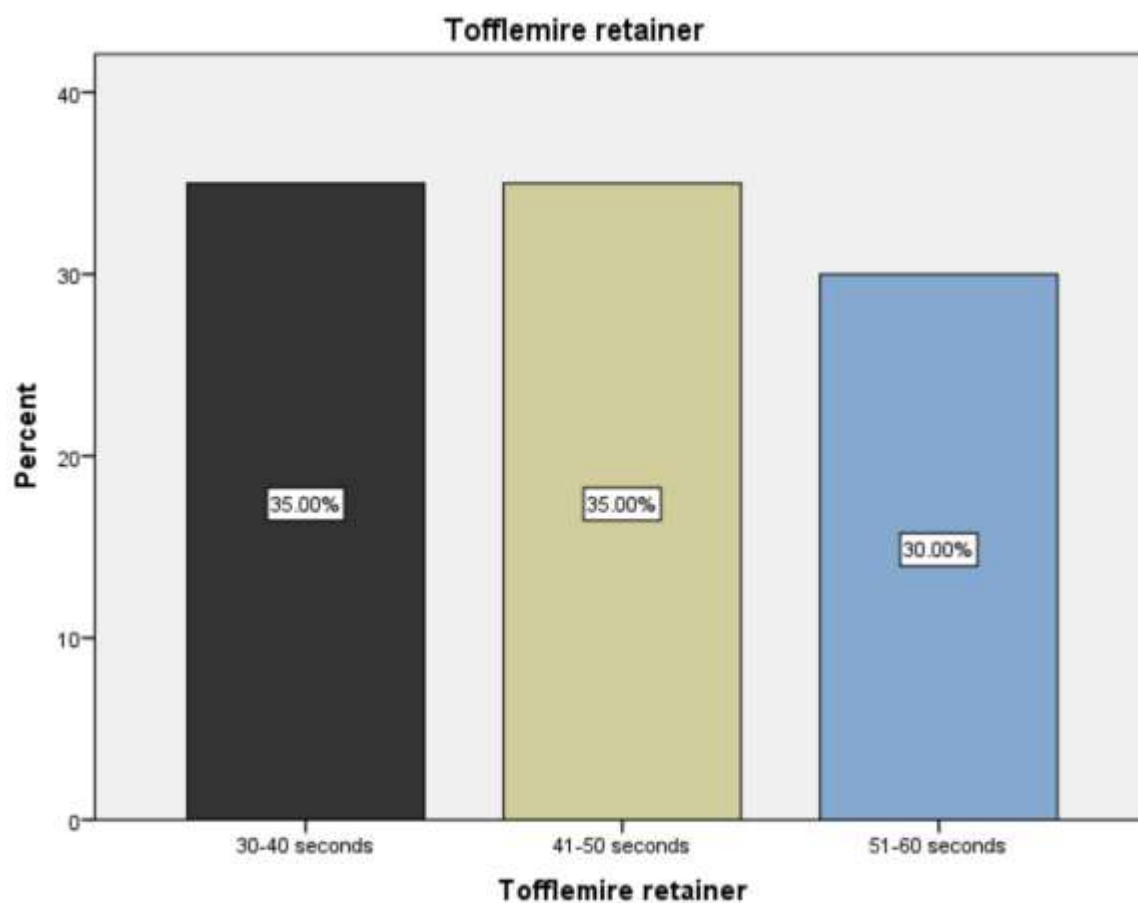
The present comparative experimental study among undergraduate students with amalgam Class II cavities. Sample size estimation was based on the study done by the gilmore(7). The sample size was 40 with 20 students. Students were selected from the department of the Department of Conservative Dentistry and Endodontics, Saveetha Dental college and hospitals, Saveetha university, chennai, Tamilnadu, India. The Operating field was isolated using a rubber dam. Pre-wedging (Contour wood wedges, Garrison Dental Solutions, USA) was done. Class II cavity was prepared following standard techniques using air rotor and diamond burs. On one side, a Tofflemire matrix was used and on the other side a sectional matrix was used. After drying the cavity the matrix band was placed as per manufacturer's instructions. Restoration on one side was completed and verified before beginning cavity preparation on the other side for the second matrix system. Burnishing, amalgam carving to be done. On completion of amalgam restoration, the matrix bands were removed first followed by wedges and the rubber dam. Final finishing and polishing was done. Time was assessed from the point where pre-wedging was

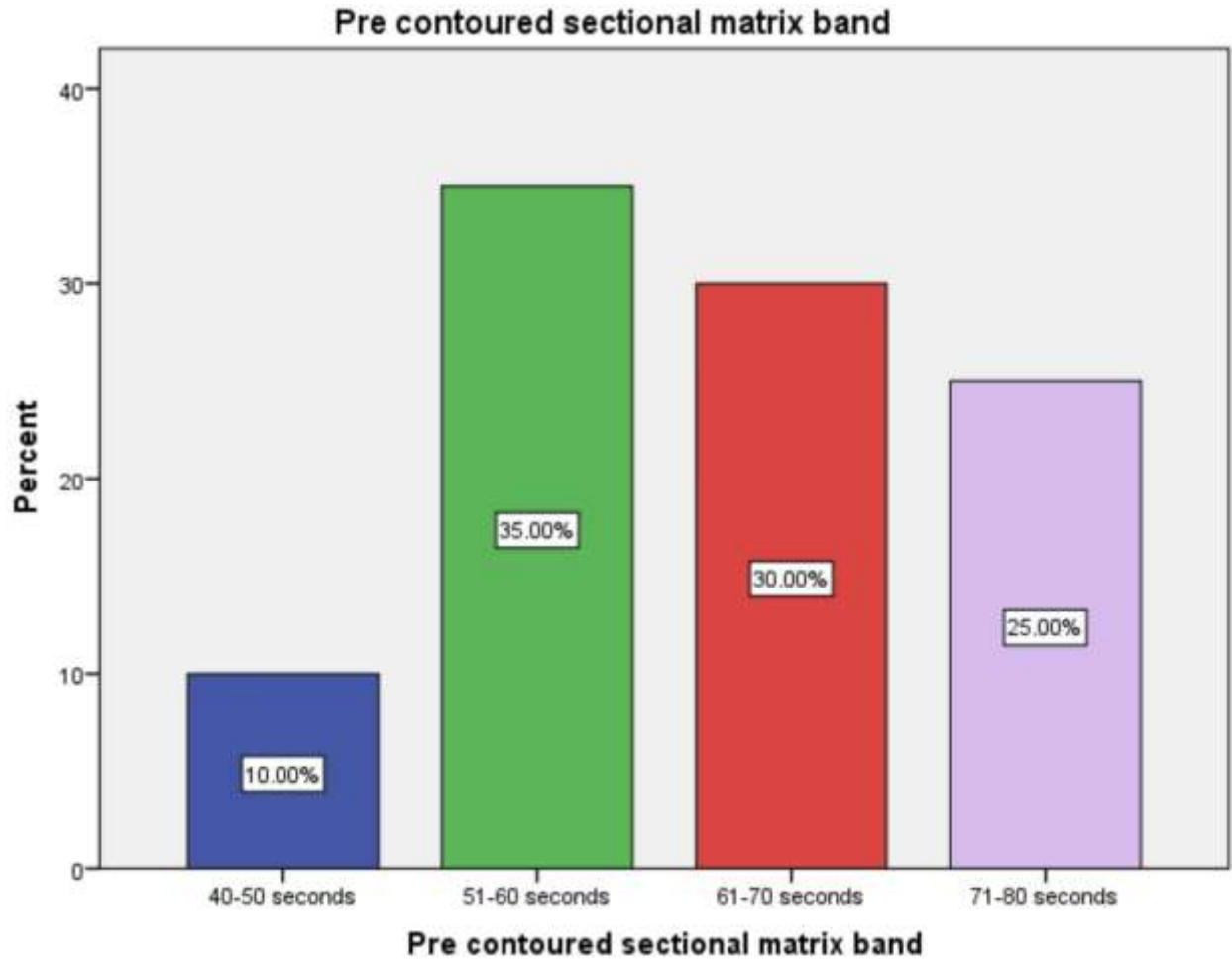


done till complete verification of placement of the matrix system. This was done using a stopwatch. Proximal contacts were assessed using dental floss. Radiographs were used to assess the proximal contacts.

RESULTS:

Statistical analysis was done using SPSS version 24. Chi-square test was used to check differences in proportions. The statistical insignificance was set at $p > 0.05$





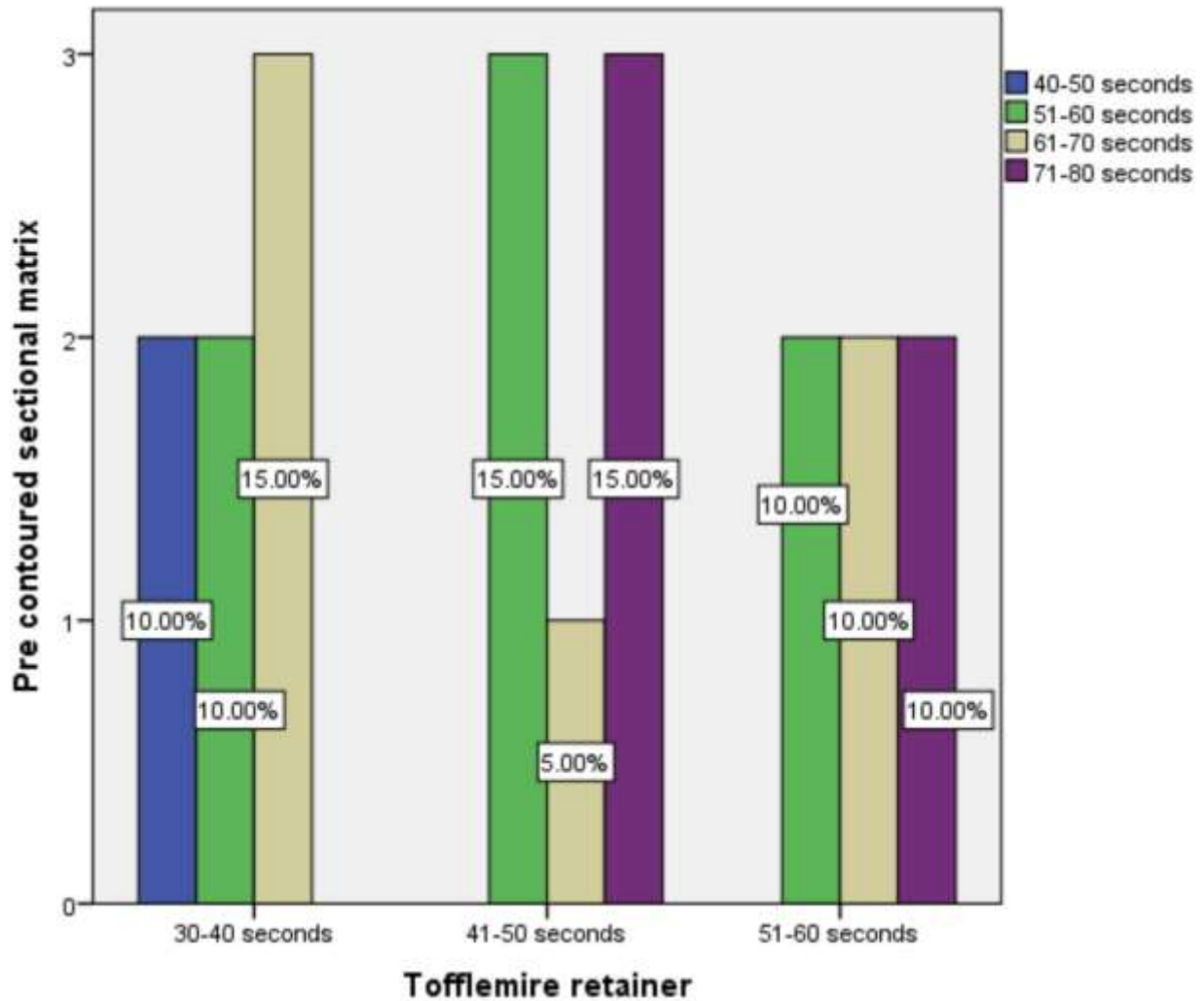


Fig.3: Comparison of mean time (seconds) between Tofflemire matrix and Pre contoured sectional matrix bands.



DISCUSSION:

In the current study, regardless of the operator experience; optimum contacts were present in 21 teeth (35%); 21 of optimum contacts (100%) were present with the sectional matrix system, and none were found with the circumferential matrix system (0%). Tight contacts were present in 11 teeth (18.3%), two were present with the sectional matrix system (18.2%), and nine were found with the circumferential matrix system (81.8%). Open contacts were present in 28 teeth (46.7%), seven were present with the sectional matrix system (25%), and 21 were found with the circumferential matrix system (75%). The results of the current study revealed that operator experience has no statistically significant influence on tightness of proximal contact regardless of the matrix system used; within either the sectional matrix system ($P = 0.2765$) or the circumferential matrix system ($P = 0.2599$).

Previous studies, observed statistically significant differences in contact tightness between circumferential and sectional matrix systems. Pre-contoured sectional matrices accompanied with interdental separation rings produced a substantial increase in the overall contact tightness of proximal restorations, and the use of flat circumferential matrices produced a considerable decrease in the contact tightness compared with the baseline situation before restorative treatment.(8)A recent clinical trial found a strong association between restoration overhang and different matrix band systems. It was observed that there was absence of any restoration overhang in cavities restored with sectional matrix systems.(9) An optimum proximal contour was achieved with sectional matrix systems accompanied with a separation ring; these findings support the outcomes of the current clinical trial. Minimal number of restorations in the pre-contoured sectional matrix group exhibited poor proximal contacts or contours; this is probably due to the fact that either the interdental separation ring itself was not effective in teeth separation, or the clinician was incapable of placing it efficiently.(5) Likewise, the reasons behind open proximal contact in the circumferential matrix group could be attributed to reasonably insufficient movement of adjacent teeth resulting from wedge placement and a flat matrix band(10). Wooden wedges swell on exposure to moisture in the oral cavity, this was believed to aid in interdental separation and adaption of the matrix band cervically(11).However, when wooden wedges absorb oral fluids they become fragile and flexible, and they adapt only to the natural anatomic proximal contour, resulting in a less amount of interdental separation.(12)Tight contact points were present with the circumferential matrix system at a higher level occlusally; dental floss could not pass or tore on placement(13)

Future scope:

It is recommended to generalize and implement the use of sectional matrix systems with separation rings in daily practice for all dental practitioners. Dental students and less experienced dentists must be trained to master using sectional matrix systems to provide optimum oral health care to their patients.



ACKNOWLEDGEMENT :

We thank saveetha dental college and hospitals for the successful completion of the study.

CONFLICT OF INTEREST:

All the authors declare that there was no conflict of interest in the present study.

SOURCE OF FUNDING:

The present project is funded by

- Saveetha Institute of Medical and Technical Sciences,
- Saveetha Dental College and Hospitals and Saveetha University
- Saveetha University
- Jyothi Gas Agency.

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