



## TOOTH PREPARATION BY THE INDIRECT VISION WITH THE HELP OF MIRROR

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### ABSTRACT

In the modern time everything is changing even in Dentistry lot of technique has been changed and still lot of things has to be changed. We as dentist have lot of challenges and we to change our attitude, knowledge and skill too to survive and to prove our self competitive and qualified. One thing which very important for training our budding students is how to develop our skill in those areas which are not easily accessible like if we are working in upper 2<sup>nd</sup> molar or 3<sup>rd</sup> molar where we can't work directly we have to take the help of mirror for work . This type of work requires lot of skill and command. tooth preparation and cavity preparation by the help of mirror is difficult task and require lot of training to execute good work so the goal of this study was to search whether we can learn and improve our skill by the help of mirror inverted movement with the device and other whether success can be transferred to the clinical situation. We divided four groups of students at different levels of dental study were asked to perform a exercise with indirect vision using Mirror device we also tried to know that whether this technique is helpful to execute their training skill into the clinical work. In the end of this experiment we find that mirror-inverted motor functions can be easily learned and enhanced by practice. These practice sessions will make students perfect in their preclinical studies and it will be much easy for them to execute their clinical work.

**Key Words:** Tooth Preparation, Indirect Vision, Mirror

### INTRODUCTION

There are the areas in the oral cavities where it's very difficult to reach for work and is carried out by indirect vision with the help of a dental mirror. In some areas we can work with direct vision that is directly on the site with physiologically adverse effect. The ability to transfer indirect vision into mirror inverted movements can be achieved by practice and neuro physiological adaptation. Once it is achieved it becomes permanent. Therefore, it is advisable to introduce motor skill early in the dental prospectus before student start patient work. Dental students should learn to perform the proposed type of preparation confidently without affecting adjacent teeth. Here we are trying to develop a simple practical training device to support dental students in transferring indirect vision into mirror-inverted movements. The objective of this study is to test the following hypotheses mirror-inverted motor functions can be learned and improved by practicing with the training device and the training acquired with this device can be applied to clinical work.

### Methods

Sixty dental students took part in this study. There were four groups of students starting from BDS 2<sup>nd</sup> year to BDS IV year. The first group (BDS 2<sup>nd</sup> year students 15 in number preclinical year). Who had no previous experience the second group (BDS 3<sup>rd</sup> year students 15 in number) who had one practice trial with the training device? The third group (BDS 4<sup>th</sup> year students 15 in number) who had 7 to 10 practice trial with the training device and fourth group (internship 15 in number) who had exposure of practice trials and 5 to 10 patient work experience. The training apparatus made up of a mirror mounted on wooden wall and a contra angle hand piece which holds the pencil lead the position of the mirror should be like that the object which is kept at the base can easily be seen, this device is very easy to handle and operate. We made four diagrams on paper base of different shapes the task was to cut the course on the pad marked by two lines with the pencil and to completely blacken various outline forms. The tracing course particularly was to help the student practice the movement in the direction reflected by the mirror. The blackening

of the forms was intended to simulate the preparation of geometric forms in dental cavities and reduction of tooth. The students were asked to trace the course outline forms within the given time and the instruction was given to them that they should not cross the boundaries make before starting of the procedure. When the boundary lines were exceeded in either the course or the outline forms it was declared as faulty work .After completing this test and then asked to start tooth preparation on the patient, the fifteen interns were asked to evaluate how helpful it is for them in mastering clinical situations with indirect vision using a dental mirror. We computed a univariate analysis of variance (ANOVA) to determine whether there were statistically significant differences in the number of errors students in the four groups made in completing the course and the outline forms, (A general introduction to ANOVA and a discussion of the general topics in the analysis of variance techniques, including repeated measures designs, ANCOVA, MANOVA, unbalanced and incomplete designs, contrast effects, post-hoc comparisons, assumptions, etc. For related information, see also Variance Components (topics related to estimation of variance components in mixed model designs), Experimental Design/DOE (topics related to specialized applications of ANOVA in industrial settings), and Repeatability and Reproducibility Analysis (topics related to specialized designs for evaluating the reliability and precision of measurement systems). In general, the purpose of analysis of variance (ANOVA) is to test for significant differences between means. Elementary Concepts provides a brief introduction to the basics of statistical significance testing. If we are only comparing two means, ANOVA will produce the same results as the test for independent samples(if we are comparing two different groups of cases or observations) or the t test for dependent samples (if we are comparing two variables in one set of cases or observations). If you are not familiar with these tests, you may want to read Basic Statistics and Tables. Post-hoc Games Howell tests were used to determine which group differences precisely was statistically significant.

### Results

Consistent with our prediction, the number of errors students made decreased markedly from Second year students to graduates. On average,

2<sup>nd</sup> year students made 60%, 3<sup>rd</sup> students made 47% errors, 4<sup>th</sup> made 27% errors and interns made 13% Thus; univariate ANOVA for number of errors was highly significant. Post-hoc Games-Howell tests showed that 2<sup>nd</sup> year students made significantly more errors than both 3<sup>rd</sup>, 4<sup>th</sup> year and interns students. The difference in number of errors between 3<sup>rd</sup> year and interns students was marginally significant. There was thus a statistical trend for interns to make fewer errors than 4<sup>th</sup> students. Figures 1 and 2 show typical samples from groups 2 and interns respectively.

**Table 1. Frequency distribution of errors for the four groups of students**

	0—4	5—9
1.2 <sup>ND</sup> year students (n-15)	2(13%)	9(60%)
2.3 <sup>RD</sup> year students (n-15)	7(47%)	7(47%)
3.4 <sup>TH</sup> year students (n-15)	9(60%)	4(27%)
4.Interns	12(80%)	2(13%)

**Table 1** gives a frequency distribution of numbers of errors for the four groups of students. Its first column clearly illustrates how the substantial decrease in average number of errors from 2<sup>nd</sup> year through intern students came about. While there was only a two 2<sup>nd</sup> year student who could perform the task with fewer than five errors, more than half of the 4<sup>th</sup> year students fell into this category. For the interns, a large majority of 80 percent performed the task with fewer than five errors

After clinical preparations, interns were asked to answer a question about the support of the device. Their responses are shown in Figure 4. Seventy five percent considered practicing mirror-inverted movements with Mirror Device helpful in performing clinical preparation in the patient's mouth (answer categories 4, 5, and 6 taken together). In addition to this practical relevance, students in all four groups stated that they had enjoyed working with the training device.

### Discussion

Mirror Device experiment was very well supported by all the students because most of them were not trained and they feel difficulty in doing patient work directly into those areas which are not easily approachable in the oral cavity and the work only can be done by the help of mirror, there was high number of error in

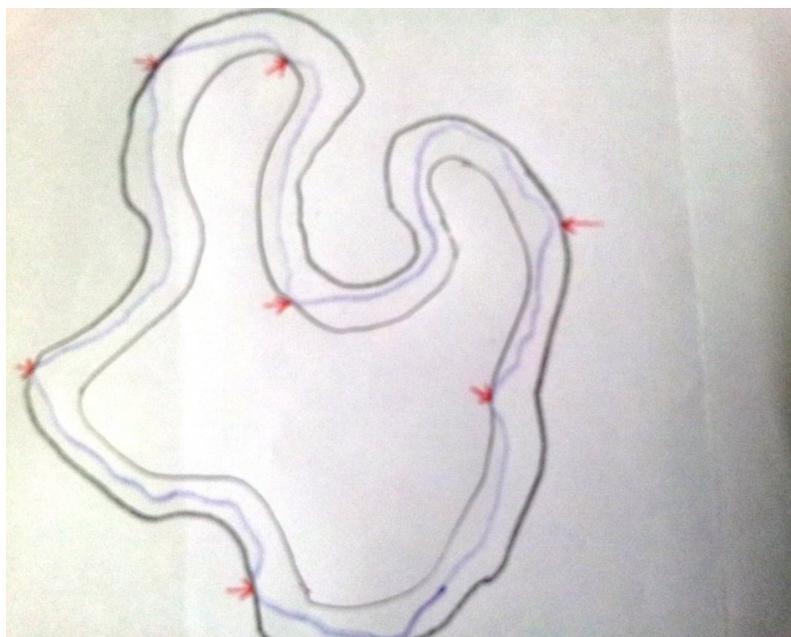


Fig 1 Sample with mistakes from the group of 2<sup>nd</sup> year students

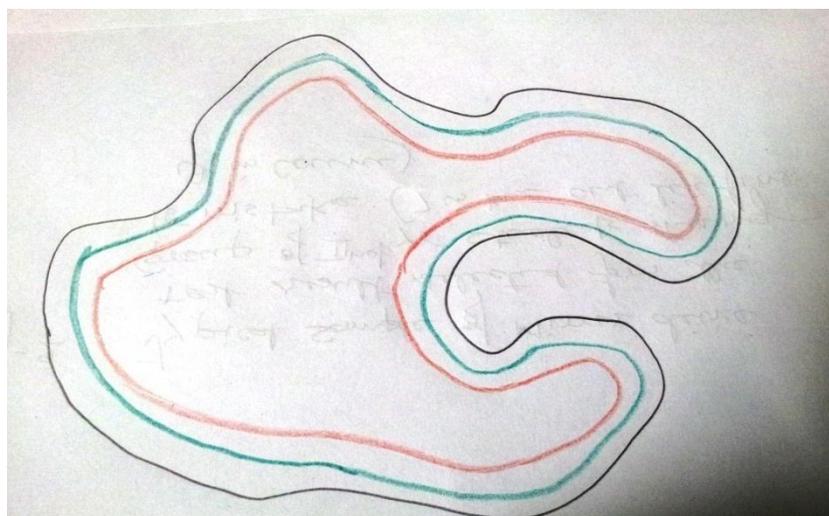
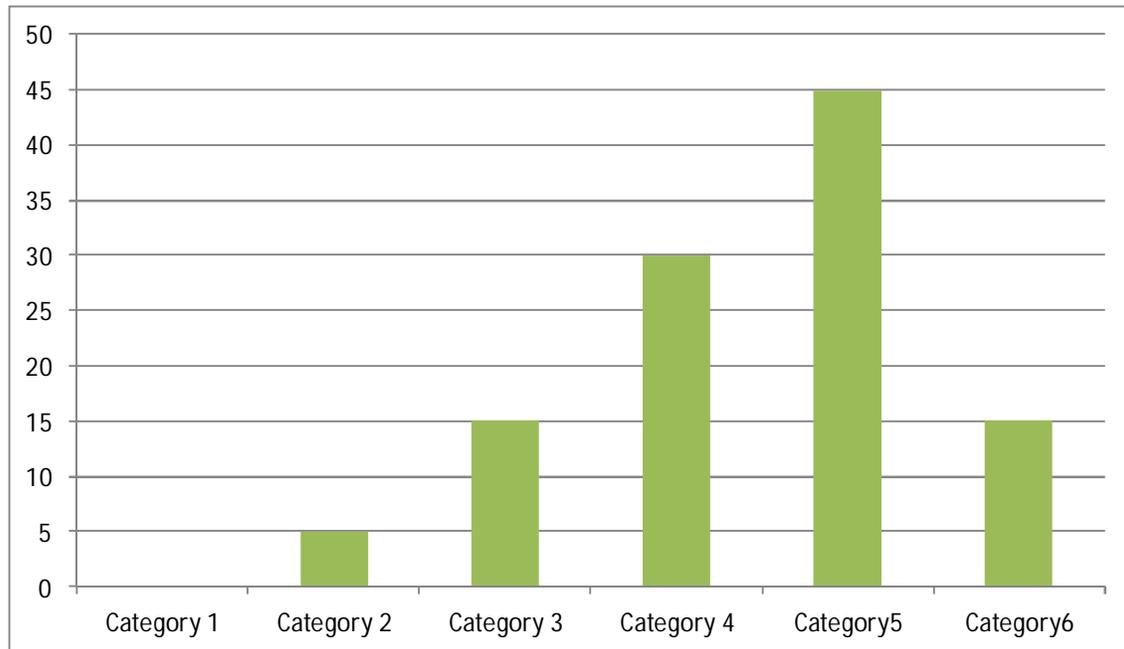


Fig 2 Sample with no mistakes selected from the group of Interns

those category of students who are untrained (2<sup>nd</sup> year & 3<sup>rd</sup> year students) than 4<sup>th</sup> year and interns. Ability to perform mirror-inverted movements requires neurophysiological adaptation. With an average number of errors of 27% and 13%, which shows that results are clearly better in 4<sup>th</sup> year and intern? Whereas 2<sup>nd</sup> year and 3<sup>rd</sup> year don't have any exposure on clinical experience with indirect preparations in the patient's mouth as well as experience in working on the dental mannequin. We can clearly see that interns and 4<sup>th</sup> year students are much better than the 3<sup>rd</sup> year and 2<sup>nd</sup> year

students it is only because of one-time practice with the device [1, 2, and 5]. Studies had shown that one time practice can significantly improve the performance and error can be easily checked, but if we compare between 4<sup>th</sup> year and intern then we can say that there is marginal change in the performance interns are better than 4<sup>th</sup> year but there number of errors in interns are is less than 15% The fact that this difference was statistically only marginally significant may largely be attributable to the .[ Fig 3] relatively small number of subjects in the study



At first sight, the low number of errors of 1.8 on average in the group of interns seems to allow for the conclusion that the tested ability can be improved and brought close to perfection by Mirror Device. However, in comparison to the other groups, these students have had more opportunity and time to practice. Furthermore, in comparison to the other two groups, the more positive results of this group may also have been influenced by advancing to higher level courses and consequently acquiring clinical experience. Therefore, a possible criticism of this study may be that it cannot definitively assess to what extent the advancement in the curriculum and the training device has a share in the learning results.

In spite of some shortcomings this experiment helps in building up our skill with indirect view can be improved by practicing with Mirror Device. The interns were asked whether they felt that prior motor practice had clinical relevance and a positive effect on working in the patient's mouth. This group was allowed to conduct a clinical preparation only after they had passed the Mirror Device test with fewer than two errors.[Fig 4] The predominantly positive answers allow for the conclusion that practice with Mirror Device is indeed helpful for clinical work in the patient's mouth. Taking into account findings from previous studies as well as our own, we consider the procedure installed in Tübingen an effective teaching method: for students to begin practicing two-dimensionally by using Mirror Device in preclinical courses, to

continue practicing three-dimensionally on the dental mannequin, and to finally take another test in the clinical course before starting to work on patients. Here study is based on practice success which was measured solely by extracting out from students' evaluation of how helpful they considered the practice in mastering the actual clinical situation. Future studies using Mirror Device as a training tool in dental education should also by evaluating their skills at preparation of teeth. 1= not helpful at all; 6= very helpful

### CONCLUSION

At the end of this study we conclude that this practice device is helpful in developing indirect motor skills to improve the tooth preparation and cavity preparation. A significant improvement of the two-dimensional motor skills was seen can be seen after practice session. Students considered the practice in mastering the actual clinical situation. This device's good as a training tool in dental education should also by evaluating their skills at preparation of teeth.

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