Abstract: Background: Today, the esthetic dentistry is considered as an important part of dental treatments. Regarding the increasing number of patients’ demand to remove tooth discolorations, need for bleaching treatment is on rise. The effect of bleaching on microleakage of composite restorations is regarded as the main factor of composite failure.

Objective: This aim of this research was to investigate the effect of pre- and post-operative bleaching on microleakage of class 5 composite restorations.

Methods: This experimental study was performed on 15, carries free eruptive human third molar divided into 3 groups of 5 members each and marked as 1) case group (pre-operative bleaching group), 2) case group (postoperative bleaching group), and 3) control group (no bleaching group). In group 1, samples were exposed to 20% carbamide peroxide-containing gel 2 hours a day for 7 days and kept in artificial saliva between the bleaching processes. After 14 days and while the bleaching were finished, class 5 cavities prepared in buccal and lingual surfaces of teeth (dimensions: 4*2*2 mm) where the gingival margin of all cavities were 1mm under the CEJ. Later, all cavities were filled with composite (Z 250/3M). In group 2, class 5 cavities were prepared, filled with composite in a similar way and exposed to bleaching process as for group 1. In group 3, only class 5 cavities prepared and repaired without bleaching. Soon after, Samples were termocycled (500 times, at 4 and 55 ºC). The process of dye penetration was carried out by placing the samples in a solution containing 1% methylene blue for 24 hours. The teeth were later sectioned and the rate of microleakage evaluated using a stereomicroscope (magnification 40x). The data were analyzed by Mann Whitney test.

Findings: The rate of microleakage in class 5 restorations exposed to bleaching (either before or after restoration) increased at both occlusal and gingival margins. The degree of microleakage at occlusal margin was lower than gingival margin in all groups. The rate of microleakage in both occlusal and gingival margins showed a significant difference, statistically (p<0.006; p<0.014) however, no significant difference at occlusal and gingival margins of case group was observed (p=0.684; p=0.264).

Conclusions: Bleaching process increases the rate of microleakage following composite restoration.

Keywords: Bleaching, Microleakage, Composite Resins, Carbamide Peroxide