Resin Infiltration Technique To Treat Hypomineralized Incisors – A Case Report

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ABSTRACT

Molar incisor hypomineralization (MIH) is a commonly occurring developmental defect causing esthetic concerns among most patients. Depending upon the severity of the lesion various treatment options are available like bleaching, microabrasion, resin infiltration, composite resin bonding or a combination of all the techniques.

This case report highlights the use of resin infiltration (ICON) in the treatment of hypomineralized incisors. The resin penetrates the lesion microporosities by capillary force and is hardened by curing with light. The infiltrated enamel has a similar appearance to that of sound enamel. Moreover it also arrests the further progression of lesion. This technique is gaining importance with passing years because it not only provides esthetic rehabilitation but also allows recovery from hypomineralization.

KEYWORDS *– Molar incisor hypomineralization, white spot, resin infiltration, ICON, recovery.*

INTRODUCTION

Molar incisor hypomineralisation is a developmentally derived dental defect that involves hypomineralisation of one to four first permanent molars and frequently associated with similarly affected permanent incisors. According to Weerheijm et al (2001)[1], its defined as 'hypomineralisation of systemic origin , presenting as demarcated , qualitative defects of enamel of one to four first permanent molars frequently associated with affected incisors'. White spot lesions are early signs of demineralization which may result in development of caries. These lesions may cause esthetic concerns among patients due to enamel discoloration and also increases the susceptibility of the tooth to fracture due to reduction in the inorganic component of enamel [2]. The treatment of these lesions aims both at improving esthetics as well as prevention of caries progression.

Worldwide the prevalence ranges from 2.4% to 40.2% [3]. Study conducted in Delhi in the year 2019 showed prevalence rate of 1.17% in children of age group 6-12 years and the severity in incisors was 24.24%and that of molars was 52.27% [4].No gender difference has been noted in multiple studies.

CASE REPORT

A 7 years old male patient, reported to the Outpatient department of Pediatric and Preventive dentistry of Guru Nanak Institute of Dental Sciences and Research, with the chief complaint of brown spots in upper front teeth region for last few years. The medical history was irrelevant. On clinical examination chalky white opacities and brownish grooves of different depth and diameter were noted on the entire labial surface of 11 and 21 (Fig 1). Similar opacities were also noted on 16 and 26.The treatment plan for this case was:

- Resin infiltration technique using "icon" for chalky white opacities.
- Flowable composite to restore the brownish pits, fissures and grooves.

Fig. 1 – Pre-operative view

PROCEDURE

The following clinical steps were conducted:

Oral prophylaxis of the affected teeth using a non-fluoridated prophylactic paste followed by isolation of affected teeth using rubber dam so as to obtain a clean dry field and protect the soft tissues (Fig 2).

The surface of white spot was eroded by application of icon etch containing 15% hydrochloric acid using a microbrush, for 2 minutes [5] to create microporosities within the enamel (Fig 4) . It also removes superficial discoloration and the higher mineralized surface layer that may hamper the penetration of resin. The etchant is then washed subsequently for 30 seconds followed by application of icon dry containing ethanol to desiccate the lesion (Fig 5) .The icon infiltrant containing TEGDMA, is then applied using a microbrush over the lesion and is allowed to penetrate for 5 minutes[6],7(Fig 6). The excess is then removed with a cotton pellet and light cured (Fig 7).The application of infiltrant is repeated 2 to 3 times to reduce enamel porosities. Flowable composite is applied over the icon infiltrant followed by light curing (Fig 8,9) .Finally the rough surface is polished with rubber disks [6] to obtain a smooth surface (Fig 10) and post-operative instructions were given to the patient.

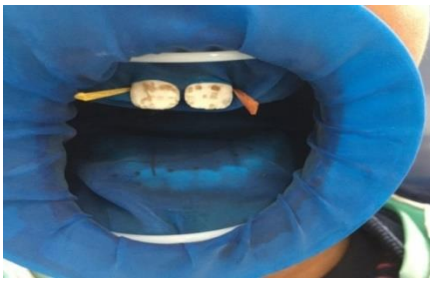

Fig. 2 – Isolation

Fig. 3 – Icon Kit

Fig. 4 – Etching

Fig 5- Icon Dry Application

DISCUSSION

Icon infiltrant contain TEGDMA which produces better inhibition of hypomineralized lesion progression than BISGMA (in conventional bonding agents) due to better penetration capabilities after ethanol application [7].
Icon etch contain 15% hydrochloric acid gel which creates more microporosities than that with 37% orthophosphoric acid thereby increasing penetration capability of "icon"8,9.
The refractive index of icon infiltrant is 1.46 ,which is very similar to that of enamel (1.62) thereby after its application the chalky white lesion appears similar to that of sound enamel 10.
Resin infiltration technique is a microinvasive cosmetic technique that fills, reinforce, masks and stabilize demineralized enamel, improving esthetics, preventing caries progression , sensitivity and increasingthe patient compliance in cases with mild MIH.
But in cases of severe MIH, resin infiltration technique alone is not enough to mask the enamel defect and requires the use of composite resin restoration along with it.

CONCLUSION

The early diagnosis and treatment of MIH is crucial as more porous enamel disintegrates more easily, not to underestimate the esthetic considerations, thereby psychological effects on the child with MIH.Thus with time the demand of resin infiltration technique are soaring high as it not only provides esthetic rehabilitation but also allows recovery from hypomineralization.

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