

Restorations of Extensive Tooth Defects in Relations to Pulp Condition

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The main purpose of restorative dentistry is to restore and maintain tooth health by adequate restorations in order to protect and re-establish pulp function [1,2], Restoring posterior teeth has an increasing esthetic demand while The best restorative option for large size caries defect in permanent posterior teeth is still a matter of uncertainty in dental literature particularly if those lesions are in close proximity to the pulp. Direct composite restorations have its limitations with very large defects, due to material natures and technique of applications. In systematic reviews for best indirect restorations with large carious defects, Crown came to front but that option necessitates extensive unnecessary tooth preparation [3-5]. On the other hand the introduction of ceramic etching and bonding to enamel and dentin by Calamia, Simonsen and Horn has changed the restorations option , adequate clinical trials have shown the superiority of the partial coverage ceramic restorations in restoring posterior teeth with fairly high success rate because bonded ceramic restorations provide the adequate contour and proximal contacts with lesser need to adjustment with superior gingival adaptation which minimize the micro leakage and the postoperative sensitivity. Also the use of water insoluble resin cement decreases the secondary caries around margins [6-9].

Generally, the indirect restorations proposed to restore extensive carious lesions or replace large defective restorations which associated with close proximity to the pulp tissue which needs pulp protection or capping [9-14], Since first pulp capping case which performed in 1756 by the Phillip Pfaff, Studies on indirect pulp treatment (IPT) show varying success rates to more than 97 %. Remarkable development in pulp preservation capping material has introduced, Clinical Studies on indirect pulp treatment (IPT) or vital pulp therapy (VPT) show varying success rates to more than 97 % and Remarkable development in pulp preservation capping material has occurred [15-17], currently advanced capping material as Bioceramics successfully support the

indirect pulp capping on deep carious lesion [18-20]. Therefore, the superiority of available pulp preservation capping material has dramatically changed the prognosis of this procedure. In Accumulative approach if the posterior teeth with successful pulp capping were restored with partial coverage ceramic restoration, the total prognosis will be better in preservation the pulp vitality, preserving the remaining sound tooth structure and give the best durable and esthetic restorative option. Today most operative procedures performed with dental rubber dam which maintain the operation field uncontaminated and septic. The fact that most of the teeth receive vital pulp therapy will necessitate extensive restorations due to the large and deep defects. Fortunately, being able to bond durable ceramic restorations to the underlying enamel and dentin allow clinician to perform advanced restorations with superior esthetic, which maintain teeth integrity and preserve the pulp vitality [11,21].

Objective

Prospective observational study investigates the outcome of treatment for posterior teeth with indirect pulp capping with MTA or Bioceramic materials and restored with partial coverage ceramic restorations (Ceramic Onlay).

Methods and Clinical Protocol

Prospective observational case series designed to assess the clinical outcome of pulp health maintainability of posterior teeth with indirect pulp capping, restored with ceramic restorations and bonded with dual cure resin cement. All teeth pulp diagnosis was within reversible pulpitis condition and prepared with Non-Selective caries excavation, the required pulp capping procedure performed with mineral trioxide aggregate (MTA) or calcium-silicate cement (Biodentine). No exclusion criteria were applied in this case series and temporized with Zinc oxide cement (non-eugenol). The endodontic evaluation for the pulp health was

performed before the treatment, clinical pulpal sensibility tests, patient report, recorded history and radiographic assessment were performed, and during the recall exam visits. All Teeth preparation were performed by restorative dentist in Prince Abdulrahman Advanced Dental Institute, considering the fundamentals of indirect ceramic restorations. Outcome parameters were evaluated for the cases in 2 weeks, 3 months, 6 months up to 2 years. The observation was assessing the clinical success in function, evaluating the health of dental pulp in all restored teeth.

Cases

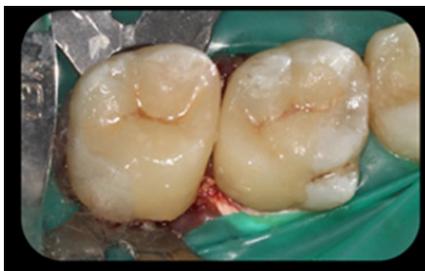
20 posterior teeth 12 male and 8 female, age range between 20 and 45 with no systematic medical conditions, all teeth has extensive caries or large defective previous restorations and were indicated for indirect pulp capping (IPC) (VPT) were restored with bonded ceramic restorations – pressed lithium disilicate glass (IPS Emax ceramic) and cemented with self-adhesive resin cement, 12 posterior teeth in the same patients were restored with composite restorations for different carious lesions as a control group. Statistical Descriptive scores were used to evaluate the pulp condition, plaque and gingivitis scores. One case has developed caries lesions around the margins, One tooth of the cases have developed symptomatic pulpitis.



Figure 1: Teeth #17, #16 with defective amalgam restoration – preoperative.



Figures 2&3: Post prep and VPT.



Figures 4: Post cementation teeth #17, #16.

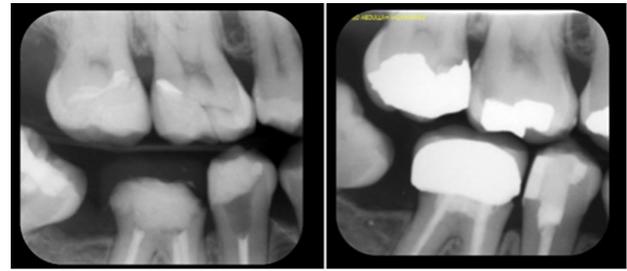
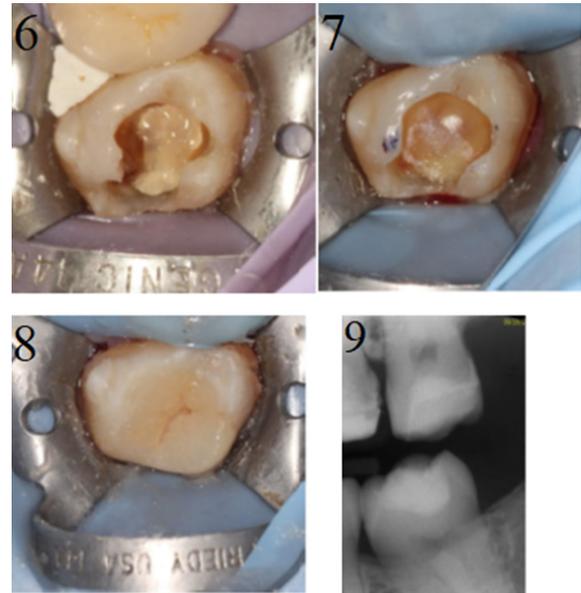


Figure 5: Pre & Post radiographs.



Figures 6,7,8,9: Pre & Post Photograph and radiographs.

Conclusion

The procedure of restoring posterior teeth with indirect pulp capping (bioceramic materials) and indirect ceramic restorations has an adequate outcome with great success in this prospective observational case series. Therefore, advanced restorative option as ceramic in restoring teeth with vital pulp therapy provide the proper esthetic and function for rehabilitation of extensively damaged teeth in addition to maintain pulp vitality and teeth integrity.

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