**Critically Appraised Topic (CAT)**

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| **Project Team:**  |
| **3B-4**  |
| **Project Team Participants:**  |
| **Sylvana Blanco, Annalise Avers, Amin Malaki, Kiwon Lee** |
| **Clinical Question:** |
| **In patients with limited interarch space, what is the long term prognosis of restoring anterior VDO with incisal composite restorations versus crowns?**  |
| **PICO Format:** |
| **P:** |
| **Patients with limited interarch space and possible loss of VDO** |
| **I:** |
| **Restoring anterior VDO with fixed restorations (crowns)**  |
| **C:** |
| **Restoring anterior VDO with incisal composite resin** |
| **O:** |
| **Better long term success with fixed restorations (crowns)**  |
| **PICO Formatted Question:** |
| **In patients with limited interach space and possible loss of anterior VDO, is the long term prognosis better with use of crowns as compared to the use of incisal composite restorations?**  |
| **Clinical Bottom Line:** |
| **Although evidence and clinical trials remain limited, there are advantages and indications for both crowns and incisal composite restorations. Any time you alter a patient’s occlusal vertical dimension, it is important to allow the patient to have trial restorations to assess the level of comfort and patient acceptance. Based on the main etiology of tooth wear there may be limited clinical crowns remaining, thus, requiring more extensive periodontal surgery in order to properly restore these teeth with crowns. Composite restorations are a more conservative and cost effective approach.**  |
| **Date(s) of Search:**  |
| **10/18/20, 11/1/20, 11/2/20** |
| **Database(s) Used:** |
| **Pubmed**  |
| **Search Strategy/Keywords:** |
| **The key words used in my search included: anterior restorations, etiology of tooth wear, composite resin restorations, fixed restorations, occlusal vertical dimension, loss of interocclusal space** |
| **MESH terms used:** |
| **Vertical dimension, tooth abrasion, tooth attrition, tooth erosion, crowns, composite resin, dental occlusion, Adult, Incisor**  |
| **Article(s) Cited:** |
| Johansson, A., & Omar, R. (1994). Identification and management of tooth wear. *The International journal of prosthodontics*, *7*(6), 506–516.Turner, K. A., & Missirlian, D. M. (1984). Restoration of the extremely worn dentition. *The Journal of prosthetic dentistry*, *52*(4), 467–474. [https://doi.org/10.1016/0022-3913(84)90326-3](https://doi.org/10.1016/0022-3913%2884%2990326-3)Hemmings, K. W., Darbar, U. R., & Vaughan, S. (2000). Tooth wear treated with direct composite restorations at an increased vertical dimension: results at 30 months. *The Journal of prosthetic dentistry*, *83*(3), 287–293. [https://doi.org/10.1016/s0022-3913(00)70130-2](https://doi.org/10.1016/s0022-3913%2800%2970130-2) |
| **Study Design(s):** |
| **Article 1: A review****Article 2: A review****Article 3: Individual Cohort Study**  |
| **Reason for Article Selection:** |
| **The main reasons for selecting these articles was because they were clinically relevant to the patient, who presents with an extremely worn anterior dentition. The articles each provided many considerations for treatment of extremely worn dentition and the importance of identifying the main etiology. The patient also would prefer a cost-effective method, so these articles helped to identify treatment methods to may be beneficial.**  |
| **Article(s) Synopsis:** |
| **Article 1:*** **The progression of tooth wear is multifactorial (including attrition, diet, disease, salivary composition, bruxism)**
* **Tooth wear more commonly seen in anterior teeth compared to posterior teeth**
* **Important during clinical exam to include analysis of static and dynamic occlusal relationships, including possible TMD. Salivary analysis is also important and plays a role in tooth wear.**
* **Once you have a differential diagnosis, treatment planning can begin**
* **Treatment is focused initially on eliminating the main etiologic factors of tooth wear for the patient**
* **When esthetics or function are substantially compromised, prosthodontic therapy is indicated**
* **Fixed restorations should be designed as single units when possible and should be of minimal extension**

**Article 2:** * **Tooth wear is multifactorial; most often attributed to attrition**
* **There are problems and concerns with increased OVD: symptoms of clenching teeth, muscle fatigque, soreness of teeth/muscles/joints, headaches, and continued tooth wear**
* **Loss of posterior support is the most common cause of decreased OVD**
* **Tooth wear is typically a gradual process, over the course of many years and generally compensated by continuous eruption**
* **3 categories, each with recommended treatment options**
* **Category 1 = excessive wear with loss of OVD**

**This category includes missing a few posterior teeth, unstable posterior occlusion, excessive wear on anterior teeth. With a loss of OVD, it is important to have trial restorations. Evaluation for comfort/function at new dimension prior to placement of fixed restoration placement.*** **Category 2 = excessive wear without loss of OVD with space available**

**Adquate posterior support, long history of gradual wear caused by bruxism, moderate oral habits, and continuous eruption has maintained OVD. Signifcant shift seen from CR to MIP. It is important to equilibrate posterior teeth for stability in CR. Tooth preparation will be used to establish retention/resistance form (pins/grooves may be indicated – or possible surgery to gain clinical crown length)*** **Category 3 = excessive wear without loss of OVD but limited space**

**Most difficult to treat because vertical space must be obtained for restorative material. These cases might require orthodontic treatment, surgical repositioning of segments, restorative repositioning, and programmed OVD modification.** **Article 3:** * **This is a 30-month prospective clinical trial using direct composite restorations for the treatment of localized anterior tooth wear. There was two treatment groups, with 16 total patients included. Group A received Durafill (microfiller) composite and scotchbond multipurpose dentine adhesive system in order to restore anterior tooth wear. Group B had restorations with Herculite XRV (microhybrid) composite and optibond dentine bonding agent. There were 5 specific inclusion criteria for patients of this study. The most common failure indicated was fracture of the composite resin, seen more with Durafill which is a microfiller. The hybrid composites were shown to perform better than the microfilled composites. Overall, direct composite restorations placed at an increased OVD can provide short term restorative solutions with localized anterior tooth wear.**
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| **Levels of Evidence:** (For Therapy/Prevention, Etiology/Harm) See <http://www.cebm.net/index.aspx?o=1025>[ ]  **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)[ ]  **1b** – Individual RCT[ ]  **2a** – Systematic Review of Cohort Studies[x]  **2b** – Individual Cohort Study[ ]  **3** – Cross-sectional Studies, Ecologic Studies, “Outcomes” Research[ ]  **4a** – Systematic Review of Case Control Studies[ ]  **4b** – Individual Case Control Study[ ]  **5** – Case Series, Case Reports[x]  **6** – Expert Opinion without explicit critical appraisal, Narrative Review[ ]  **7** – Animal Research[ ]  **8** – In Vitro Research |
| **Strength of Recommendation Taxonomy (SORT) For Guidelines and Systematic Reviews**See article **J Evid Base Dent Pract 2007;147-150**[ ]  **A** – Consistent, good quality patient oriented evidence[x]  **B** – Inconsistent or limited quality patient oriented evidence[ ]  **C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening |
| **Conclusion(s):** |
| Article 1:* Management should be first directed toward elimination of etiologic factors
* Important to have a complete clinical examination to narrow in on a differential diagnosis
* Regardless of restorative decision, regular recall of these patients is essential

Article 2: * Restorations of extremely worn dention is challenging for dentists
* Need to carefully evaluate all the factors presents (etiology, medical history, etc.)
* There are various modalities that are successful in treating these patients (fixed, composite)

Article 3: * Hybrid composites were shown to perform better than the microfilled composites
* Direct composite restoratinos placed at an increased OVD can provide short term restorative solutions with localized anterior tooth wear
* With repeated failure, one patient was given 6 anterior PFM crowns (better long term prognosis)

Based on the literature I reviewed, I would recommend that this patient restore the severe anterior wear on the lower mandibular teeth with composite resin. The patient will be receiving an upper removeable partial denture to help restore both anterior teeth and posterior teeth. I believe that the RPD can be designed to allow for an open bite and limit the amount of force and wear on the lower anterior incisors. Due to the fact that fracture was the most common cause of failure reported with composite resin use, in creating an open bite and limiting anterior tooth contact this will help reduce the risk of future wear and composite fracture. It would be beneficial to create an interim RPD to make sure the patient is comfortable and accepting the potentially increased OVD because of limited space available. This approach is more conservation and financially feasible for the patient, which is also a concern. Although there are limited clinical studies regarding restoring extremely worn anterior dentition, I would recommend starting with a more conservative approach for this patient and increasing interocclusal space with an RPD. In the event of multiple failures with composite resin restorations, crowns can always be considered in the future.  |