



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 6.078

(Volume 6, Issue 2)

Available online at: [www.ijariit.com](http://www.ijariit.com)

## SHARONLAY: A new approach for post endodontic restorations: A Case Report

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### ABSTRACT

Root canal treatment leads to a considerable loss of tooth structure so after completion of root canal treatment it should ideally be followed by a restoration which allows cuspal coverage. This is important as there is a direct relationship between the amount of remaining tooth structure and the ability to resist occlusal forces. The cuspal width to length ratio of 1:2 or more decides whether there is a requirement of full crown or an onlay. SHARONLAY is a new onlay design providing the necessary reinforcement in a conservative manner and protecting endodontically treated teeth against both vertical and horizontal forces. This case report presents the use of sharonlay as a possible alternative for post endodontic restorations

**Keywords**— Sharonlay, Root Canal Treatment, Post Endodontic Restoration

### 1. INTRODUCTION

Root canal treatment can cause number of changes to the tooth including physical and chemical properties of dentin, its elasticity, resistance to fatigue, changes in morphology, biomechanical behavior and loss of proprioception<sup>(1)</sup>. The tooth may lose its strength to 60% due to dehydration, caries, access preparation and biomechanical preparation<sup>(2,3)</sup>. Endodontic treatment should protect the remaining tooth structure from fracture due to masticatory load in addition to restoring the normal form, function and esthetic of the tooth<sup>(4,5)</sup>.

Based on the remaining tooth structure, masticatory load and retention, this restorative method is chosen<sup>(6,7)</sup>. Sharonlay is a single unit Onlay with a post extending into the root canal to enhance the retention and resistance based on the clinical situation. It is indicated for single rooted premolar or single rooted molar.

### 2. INDICATIONS

- In single rooted premolars, Sharonlay can be fabricated for mesio-occlusal, disto-occlusal or mesio-occlusal-distal lesions involving the pulp as a post endodontic restoration.
- In cases of subgingival proximal margins, as it is difficult to place direct restorations, Sharonlay is indicated being a single unit restoration and has only a tooth restoration interface in subgingival region.
- In teeth with short clinical crowns and where vertical dimension of the tooth is small.
- Sharonlay can be given in premolar with 2 roots where 1 root is parallel to line of draw of onlay.
- Can be used in molar when extra retention is required.

### 3. CONTRAINDICATIONS

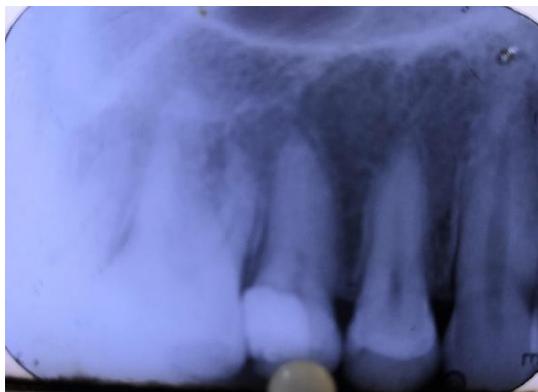
- It is not indicated for extensively damaged crown which cannot support an Onlay.
- Sharonlay is contraindicated cases where extensive radicular dentin removal is required to align the post with the Onlay.
- It is not indicated in severely curved roots.

Step wise procedure for Sharonlay:

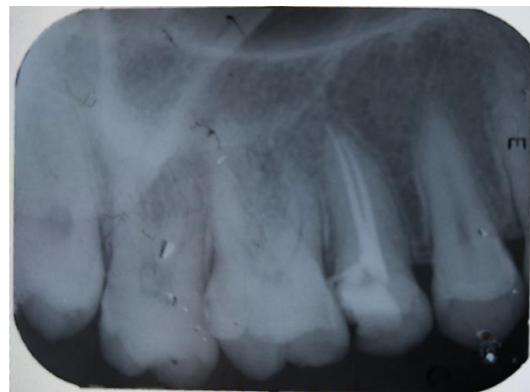
- Step 1: After completing the root canal treatment, the post space is prepared with peeso reamer #3 upto 7mm depth from canal orifice. Depending on root length, canal depth can be increased. Peeso reamer #4 or #5 can be used depending on initial canal diameter.
- Step 2: Internal walls of coronal cavity are finished with 5<sup>0</sup> taper.
- Step 3: Buccal and lingual cusp are reduced to 1-2mm depending on material used.
- Step 4: Counter bevel of 0.5mm on buccal cusp for esthetic and 1mm on lingual cusp placed to obtain hooding effect.
- Step 5: Post space is produced with rubber base material and impression made.
- Step 6: Removable die is prepared, indirect wax pattern made and casting is done.
- Step 7: Try in is done.
- Step 8: After checking for proper occlusion and contacts it is cemented on to tooth with Type 1 GIC (GC Fuji 1).

**Case 1:**

A 23-year-old female patient reported to the Department of Conservative dentistry and Endodontics with chief complaints of pain with 15. IOPA x-ray showed pulpal involvement of the tooth, so root canal treatment was initiated and completed in single visit as there was no periapical pathology. In the next appointment considering the remaining tooth structure, it was planned for Sharonlay as a post endodontic restoration. After completing the root canal treatment, as palatal canal was in line with draw of onlay, it was decided to place post in palatal canal and crown preparation was done to receive the Sharonlay and rubber base impression was taken. The cast restoration of base metal was made and cemented on 15. The radiograph shows the restoration of Sharonlay along with its post with adequate extension



**After completion of RCT**



**Postoperative radiograph**



**Post space preparation**



**Finished and Polished Sharonlay**



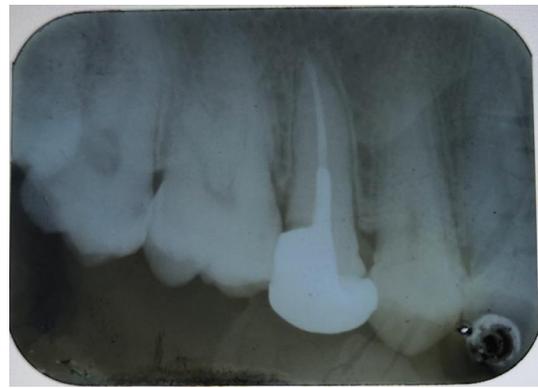
**Crown preparation for Sharonlay**



**Buccal view of Sharonlay**



Occlusal view of Sharonlay



Postoperative Radiograph

Fig. 1: Case 1 pictures

### Case 2

A 28-year-old female patient reported to the Department of Conservative dentistry and Endodontics with chief complaint of pain with 45. Iopa x ray show caries extending to pulp. Root canal treatment was started and completed in the same visit. In the subsequent visit post space was prepared, crown preparation was done and impression was taken. Patient was then recalled for final cementation of Sharonlay.



Preoperative Radiograph



After completion of RCT



Post space preparation



Crown preparation of Sharonlay



Impression taken with rubber base impression



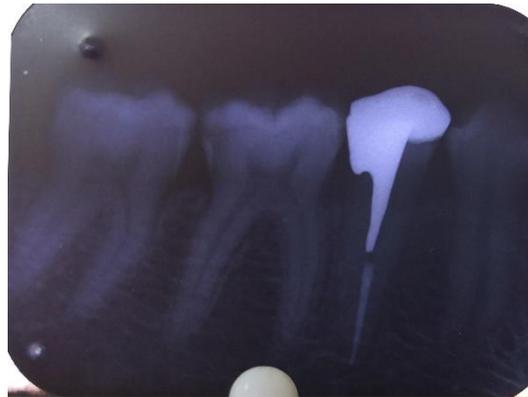
Finished and Polished Sharonlay



Labial view of Sharonlay



Occlusal view of Sharonlay



Postoperative Radiograph

Fig. 2: Case 2 pictures

#### 4. DISCUSSION

In today's era of minimally invasive dentistry, minimal tooth preparation is needed even for a post endodontic restoration. The onlay is the most conservative posterior post-endodontic restoration which is indicated when adequate tooth structure is available on buccal as well as lingual sides and for posterior teeth that are subjected to compressive loading. The single rooted premolars are subjected to both compressive and tensile forces<sup>(8)</sup>. Sharonlay is a design consisting of an onlay with post extending into the radicular portion casted into a single component giving the advantages of the onlay and radicular post extension. It is indicated to enhance retention as the post in a multirooted molar does not enhance resistance<sup>(9)</sup>. As compared to two unit components, single component restorations have a greater surface area for dissipation of stresses<sup>(10)</sup>.

In Sharonlay, the radicular extension can be kept as minimal as possible (minimum 7mm) so as to enhance resistance at the cervical region and not weakening the radicular portion. However, in cases where the coronal tooth structure is weakened, the length of the post can be proportionately increased to dissipate the load and also enhance retention<sup>(11,12)</sup>. The diameter of the post would depend upon the final preparation of the canal, with minimal enlargement with size # 3 peeso reamer in order to orient the post to the overlying onlay and provide adequate strength to the post. The onlay is designed to conserve the tooth structure and preserve any healthy marginal ridge. The design is planned keeping in mind the esthetic requirement and the hooding effect required to prevent splitting of the crown. Sharonlay being a single unit restoration which is the most economical and durable long term restoration for a single rooted endodontically treated premolar or molar.<sup>(13)</sup> Sharonlay in these case reports are used in upper and lower premolar which provide them with resistance and retention with minimum tooth preparation.

#### 5. CONCLUSION

Post endodontic restorations are important and it should be planned before we start endodontic treatment. Selection of proper case is prime consideration for the success of treatment or it will lead to failure of the treatment. Premolars are subjected to both tensile and compressive stresses at the cervical region. Clinicians pay minimal attention to cervical reinforcement especially when there is adequate coronal tooth structure.<sup>(14)</sup> SHARONLAY design which is a single component (onlay with post) has been tested clinically for more than a decade. Evaluation of these restorations after 10 years will show promising long-term success of this design.

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