



# “Bringing Back the Basics: The Revival of Cast Metal Restoration in Dentistry” – A Case Report

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**Abstract :** This case study highlights the effectiveness of indirect cast metal onlay restoration in restoring a posterior tooth. Cast metal restorations have long been a staple in restorative dentistry due to their durability and reliability. While alternative materials like ceramics and composite resins have emerged, cast metal restorations remain the best option in certain situations, such as extensive tooth damage or high biting forces. This report showcases the evolution of cast metal restoration techniques and their continued relevance in modern dental practice, particularly in cases where a metal onlay is used to replace a tooth cusp and reinforce the tooth.

**IndexTerms** –Restorative dentistry, Cast metal restoration, Indirect pulp capping, Onlay, MTA.

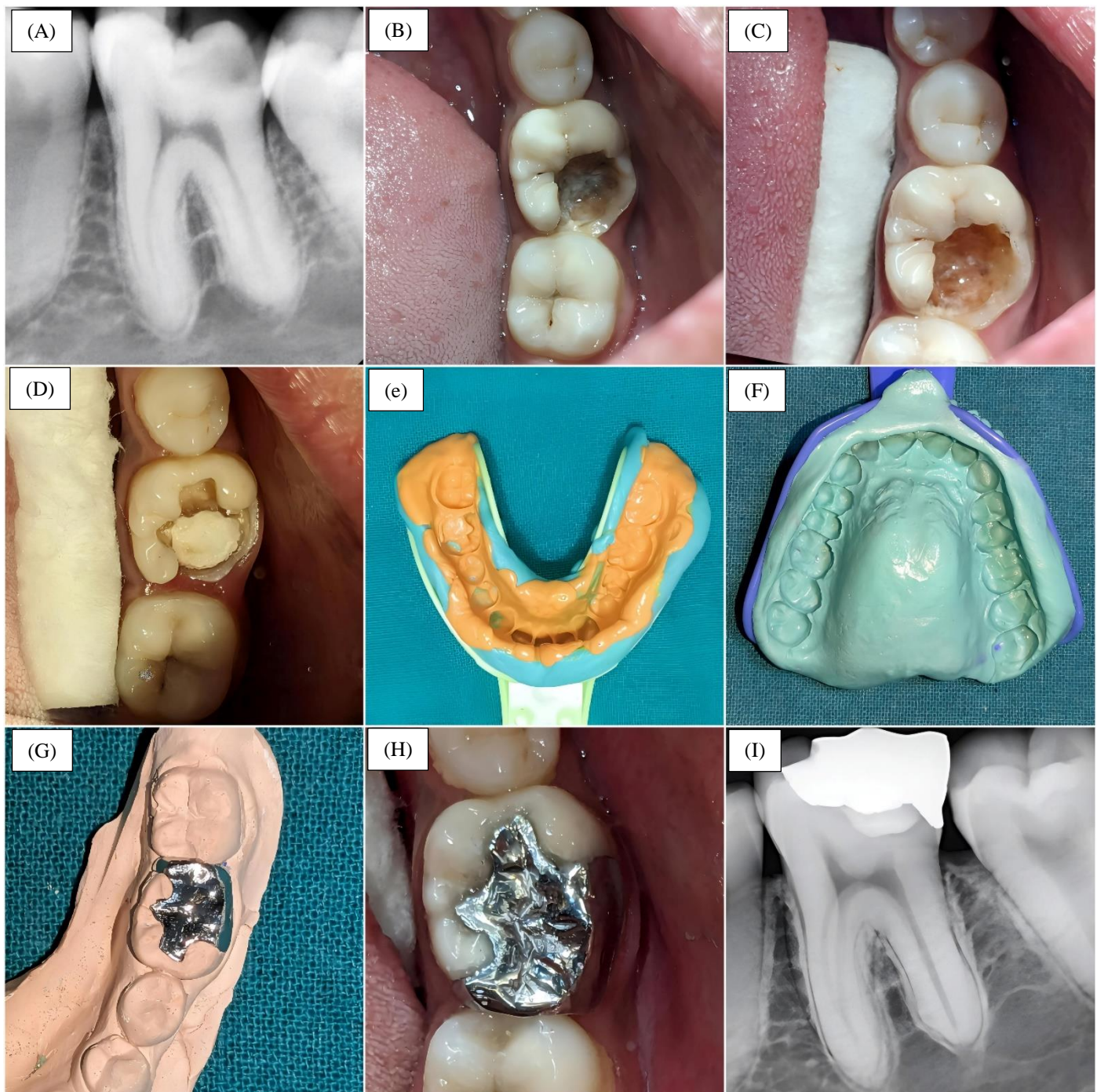
## INTRODUCTION

Structural tooth loss due to fracture, caries, or mechanical preparation is a common and significant clinical occurrence, particularly in mandibular and maxillary molars, which bear the highest masticatory loads and are thus more prone to breaking <sup>[1]</sup>. The consequences of tooth structure loss can be far-reaching, affecting not only the tooth's shape, function, and aesthetics but also the overall oral health and well-being of the patient <sup>[5]</sup>. When a substantial portion of the coronary structure is lost, indirect restorations become necessary to restore the tooth's integrity and prevent further damage <sup>[5]</sup>. The choice of restoration depends on various factors, including the extent of tooth structure loss, arch structure, pulp status, occlusion, patient concerns, and dentist preference <sup>[2]</sup>. In cases where a significant amount of tooth structure is lost, indirect restorations such as overlays, onlays, and inlays offer a reliable solution, providing the necessary resistance and retention form to support the damaged tooth <sup>[1]</sup>. Direct restoration is not feasible in such cases, and indirect restorations offer a reliable solution <sup>[2]</sup>. The selection of the appropriate restoration is crucial to ensure the longevity and success of the treatment, and dentists must carefully evaluate the patient's individual needs and circumstances to make an informed decision <sup>[9]</sup>. By understanding the options and limitations of indirect restorations, dentists can provide high-quality care and improve patient outcomes.

## CASE PRESENTATION

A 31-year-old man presented to the department of conservative dentistry and endodontics with a chief complaint of food lodgment in the area of lower left back teeth region for two months. On radiographic examination reveals radiolucency involving enamel and dentin and not approaching pulp with tooth 36. In this instance, indirect onlay was the selected course of action. The purpose of the local anesthetic was to minimize sensitivity and discomfort. Rubber dam isolation was carried out, and the occlusal punch cut was accomplished using number bur 271 with an initial depth of 1.5 mm, verified with a periodontal probing sides. followed MTA capping. Then occlusal bevel, including the circumferential tie, was prepared with an 8862 bur with fine grit, followed by Elastomeric Impression. After die cutting and casting, a wax pattern was created and invested using type II inlay wax. After that, the metal onlay (made of a base metal alloy of cobalt-chromium) was polished and completed, and the fit was assessed using the

cast. This final onlay was then placed in the patient's mouth and checked for occlusion and high points, followed by final cementation. After the excess cement was removed using dental floss and a sharp explorer, the patient was taught oral hygiene techniques and shown a demonstration using a model, illustrating proper brushing and flossing methods.



## Research Through Innovation

Figure-(A)Pre-Operative Radiographic Image ,Figure(B) Pre-Operative Intraoral View ,Figure (C) After Caries Excavation , Figure (D) Cavity Preparation ,Figure (E),(F) Elastomeric Impressions,Figure (G) Cast Metal From Laboratory, Figure (H) Post Cementation - Intraoral View,Figure (I) Post Cementation - Radiographic Image.

### DISCUSSION:

The use of cast metal onlays as a restoration option for teeth with extensive damage offers a promising solution for preserving tooth structure and restoring functional integrity, as evidenced by the successful outcome of this case study. By preserving the remaining



tooth structure and restoring functional integrity, onlays offer a valuable alternative to more extensive restorations like crowns <sup>[1]</sup>. The importance of careful preparation to ensure tooth vitality is also highlighted <sup>[2]</sup>.

The limitations of traditional restorative materials like silver amalgam and composite restorations are well-documented <sup>[6]</sup> <sup>[8]</sup>. The toxicity and polymerization shrinkage associated with these materials can lead to compromised restorations and adverse health effects <sup>[6]</sup> <sup>[8]</sup>. Ceramic crowns, while aesthetically pleasing, require significant tooth reduction, making them a less conservative option <sup>[7]</sup>.

In contrast, cast metal onlays offer a strong and durable solution for large cavities, with a proven track record of success <sup>[1]</sup>. The ability to conserve tooth structure and maintain functional integrity makes them an attractive option for clinicians seeking to minimize invasive procedures.

Future research directions may include investigating the long-term efficacy of cast metal onlays and developing new materials with improved properties. Additionally, exploring the potential applications of digital dentistry and CAD/CAM technology in fabricating cast metal onlays could further enhance their clinical utility.

## CONCLUSION:

In conclusion, cast metal onlays offer a reliable and conservative treatment option for teeth with extensive damage, providing a strong and long-lasting restoration that can reconstruct the correct occlusal architecture <sup>[1]</sup>. Although the process requires multiple patient visits and strong laboratory support, the benefits of cast metal onlays make them a valuable treatment modality that should be encouraged and utilized more frequently <sup>[3]</sup>. By mastering the art of onlay tooth preparation, clinicians can expand their treatment options and improve their expertise in tooth preparation, ultimately leading to better patient outcomes. The success and longevity of cast metal onlays depend on various factors, including the materials used, the clinician's technique, laboratory support, and patient care <sup>[3]</sup>.

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