Comparison of Postoperative Pain and Evaluation of Success of Endodontic Treatment with Truss Access Preparation: A Case Series

Dr. Ruchika Pandey, [1] Dr. Nitin Kararia, [2] Dr. Athira Prathapan, [3] Dr. Akanksha Swaraj, [4] Dr. A. Aditya Raj Kumar [5]

1. **Dr. Ruchika Pandey**
   PG Resident, Department of Conservative Dentistry and Endodontics, NIMS Dental College & Hospital, Jaipur, Rajasthan, India
2. **Dr. Nitin Kararia**
   Head of Department, Department of Conservative Dentistry and Endodontics, NIMS Dental College & Hospital, Jaipur, Rajasthan, India
1. **Dr. Athira Prathapan**
   PG Resident, Department of Conservative Dentistry and Endodontics, NIMS Dental College & Hospital, Jaipur, Rajasthan, India
4. **Dr. Akanksha Swaraj**
   PG Resident, Department of Conservative Dentistry and Endodontics, NIMS Dental College & Hospital, Jaipur, Rajasthan, India
5. **Dr. A. Aditya Raj Kumar**
   PG Resident, Department of Conservative Dentistry and Endodontics, NIMS Dental College & Hospital, Jaipur, Rajasthan, India

CORRESPONDING AUTHOR

Dr. Nitin Kararia (H.O.D)

Department of Conservative Dentistry and Endodontics
NIMS Dental College & Hospital, Jaipur, Rajasthan, India
Mobile - +916376830828
Email - nitin.kararia@nimsuniversity.org
Address - 93 Arcadia Greens, B-block, Vaishali Estate, Gandhi Path(West), Jaipur, Rajasthan, India
ORCID I'D - 000000023115223X

Abstract

This article outlines a clinical case series of new minimally invasive access cavity preparation techniques to improve tooth fracture resistance and prolong its survival. Root canal treatment was performed in patients with an ultraconservative approach for access opening of the molar in two visits, and high-strength direct composite restoration was performed. It can be concluded that truss access cavity improves the fracture resistance of endodontically treated teeth.

Keywords: access cavity preparations, conservative access cavity design, minimally invasive access cavity design, truss access cavity preparations.

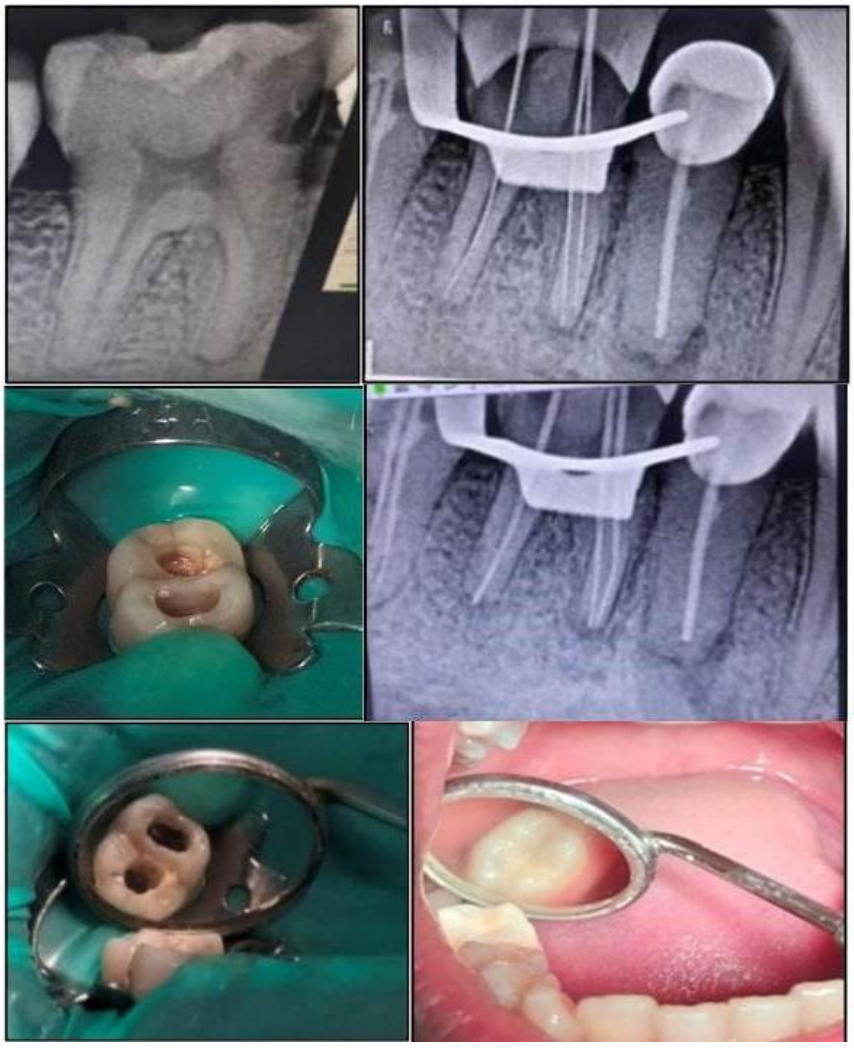
INTRODUCTION

Endodontic access cavity preparation is the first and most important step for successful endodontic treatment resulting in removing caries, deroof the pulp chamber, discovering all canal orifices, and having direct access without destroying healthy tooth structure. (1) Endodontic treatment consists of three major factors: cleaning and shaping, disinfection, and

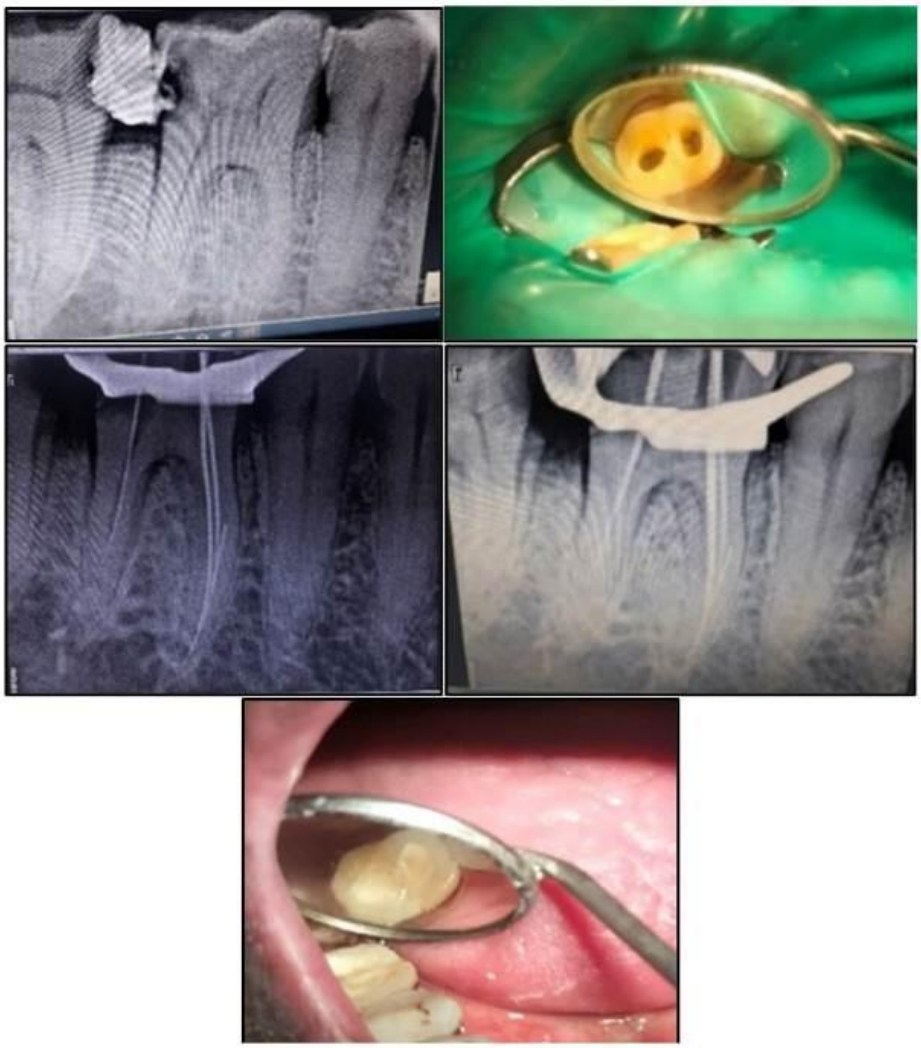
three-dimensional obturation of the root canal system. [2] Recently, with all these advances, a minimally invasive access cavity has been proposed in endodontics with the goal of preserving the pericervical dentin. [3]

Traditional Endodontic Access Cavity weakens the tooth structure especially because of pathology. Various treatment modalities can be used from simple direct restoration with or without a post and core, inlay, onlay, and full-coverage crowns. [4] The conservative access cavity is a narrowed form of conventional cavity starting from the central fossa and expands adequately to detect the opening of the canal orifice. [5] Ultraconservative access cavities aim to preserve as much tooth structure as possible, which generally impairs the visibility and comfort of clinicians. For ninja or point access, access is gained through the central fossa or deepest part of the occlusal surface and advanced apically with a minimal increase in dimension. [6] The truss access or orifice-directed access targets only the canal orifices, and the dentinal bridge is preserved. [7] This design can be modified further to access each canal through a separate hole. However, the truss access is not standardized and has been presented in the endodontic literature with different sizes. [8]

CASE REPORTS



Case Report 1: (a) Pre-operative radiograph, (b & c) Truss access cavity preparation design, (d) Working length radiograph, (e) Master cone radiograph, (f) Post-obturation photograph



Case Report 2: (a) Pre-operative radiograph, (b) Truss access cavity preparation design, (c) Working length radiograph, (d) Master cone radiograph, (e) Post-obturation photograph

DISCUSSION

The choice of access cavity design in endodontic treatment is a critical factor that can significantly impact the long-term prognosis of the tooth. The truss access cavity, as a conservative approach, has shown promising benefits in preserving tooth structure and providing cuspal protection, leading to increased fracture resistance compared to traditional access cavity designs. This approach can be particularly beneficial in mandibular first molars, which are more susceptible to fracture and often require cuspal protection.

However, it is essential for clinicians to be aware of the potential challenges and drawbacks associated with the truss access cavity. Inaccuracy and gauging during cavity preparation, the risk of missing canals, and the need for precise radiographic assessment are all factors that need to be carefully considered. Clinicians should have sufficient clinical experience and training before attempting the truss access approach to minimize these risks.

Radiographic evaluation, along with a thorough clinical examination, is crucial in determining the feasibility of using the conservative access design for each individual case. If difficulties arise during treatment, the clinician should be prepared to switch to a more traditional access cavity to ensure proper canal identification and preparation.

Striking the right balance between preservation and accessibility is essential when planning the access cavity design. By considering the needs of the operator, the restoration, and the tooth, clinicians can make well-informed treatment

decisions and aim for the best possible outcome for their patients.

Minimally invasive endodontics, when combined with proper treatment planning and assessment, can significantly contribute to the long-term survival and success of endodontically treated teeth. It is an evolving field in dentistry that seeks to optimize treatment outcomes while preserving as much healthy tooth structure as possible. As technology and techniques continue to advance, the clinician's role in providing effective and conservative endodontic treatment becomes even more crucial in achieving favorable results for their patients.

CONCLUSION

It can be concluded that truss access cavity may improve the fracture resistance of endodontically treated teeth compared to traditional access cavities. Minimally invasive access cavities can be more challenging to perform, and there is a higher risk of ineffective canal instrumentation and procedural errors. There are certain limitations associated with minimally invasive access cavities. Factors such as tooth position, patient's mouth opening ability, degree of calcification in the tooth, and the possibility of file breakage can impact the feasibility and success of this technique. Additionally, in minimally invasive access cavities, the pulp chamber is not completely deroofed, which may require more meticulous instrumentation and copious irrigation with sodium hypochlorite to ensure proper disinfection. All these factors can make the procedure more time-consuming and may require additional training for clinicians to master the technique effectively.

Outcome and Follow-up: The prognosis for the current case was good.

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Article Type: CASE REPORT

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