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The disguised molar: Clinical conundrum into molarized premolar: A case report

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Abstract
Objective: In the present study, three tooth colored, commercially available provisional restorative materials (Protemp 4, Cool Temp, Luxatemp Fluorescence) were chosen to test and compare the flexural strength and elastic modulus.
Materials and Methods: 30 specimens (with a change in thickness of 0.5mmin every 10) were fabricated for each material and stored in artificial saliva in separate plastic jars for 14 days. They were further tested for flexural strength by three-point bending test under a universal testing machine.
Results: The results obtained were statistically compared and it was found that the highest values of flexural strength and elastic modulus were exhibited by Protemp 4.
Conclusion: The present study concluded that Protemp 4 by 3M ESPE showed the highest flexural strength and elastic modulus; Cool Temp by Coltene showed the least flexural strength and Luxatemp Fluorescence showed the least elastic modulus amongst the three.

Keywords: Molarized premolar, fast break, bioceramic sealer

Introduction
A comprehensive understanding of tooth morphology, encompassing both crown form and root canal anatomy, is fundamental to predictable clinical outcomes [1]. Morphological deviations, though uncommon, may have significant diagnostic and therapeutic implications [2]. External anomalies such as molarisation or macrodontia can compromise occlusal harmony, predispose teeth to caries and periodontal breakdown, and complicate restorative procedures [3]. Similarly, internal variations in root and canal anatomy pose challenges in endodontic management, where unrecognized complexities may result in missed canals, incomplete debridement, and eventual treatment failure [4].
In the Indian population, maxillary first premolars most frequently exhibit two-rooted morphology with Vertucci Type I and IV canal configurations, while second premolars are generally single-rooted but still demonstrate considerable variation, most often Types II, IV, and I.5 Collectively, first premolars present greater anatomical complexity than second premolars, emphasizing the importance of population-specific data when planning treatment.
From a developmental perspective, anomalies such as molarisation and macrodontia originate during the morpho-differentiation stage of odontogenesis. These disturbances can result in oversized crowns, molar-like cusp patterns, and atypical root morphology. Clinically, they may present as malocclusion, crowding, occlusal interference, deep developmental grooves predisposing to caries, or aesthetic concerns.
The present case was selected for its rarity and clinical significance, as it documents a molarized premolar—a premolar exhibiting molar-like crown morphology. To the best of our knowledge, such cases are scarcely reported in the Indian literature.6 This report adds to the understanding of both external and internal morphological deviations, underscores the role of advanced imaging in diagnosis, and highlights the importance of individualized, anatomy-driven management strategies.

Case

29-year-old male patient reported to our department, with severe pain and tenderness in upper left side from 15 days. On clinical examination, a deep carious lesion was observed in tooth number 25. Fig 1

The tooth was tender on percussion. Radiographic examination confirmed the diagnosis of irreversible pulpitis in 25. Fig 2

Radiographic evaluation revealed the following-

1. Deep disto-proximal decay in 25 involving pulp
2. Sudden loss of radiolucency in the pulp chamber

Diagnosis

Symptomatic irreversible pulpitis with symptomatic apical periodontitis wrt 25

Treatment plan

Root canal treatment followed by fiber post and crown placement wrt 25

The tooth was isolated using rubber dam isolation and caries was excavated completely.

Tooth was anesthetized with 2% lignocaine 1:80,000. Then access opening was done using endo access bur number 2. Initially only two main canals, that is buccal and palatal canals could be negotiated.

Later on, angulated view radiograph was made using tube shift technique, and a point of "fast break" was seen after which the radiolucent canal outlines were not easily traceable on the x-ray.7 Fig 3 This hinted towards presence of a split and an atypical canal anatomy.

So CBCT was advised which revealed the unusual anatomy. Fig 4

The access cavity was modified into a "T" shaped design with more widening than usual of the buccal aspect.

Three canals, namely-mesio buccal, disto buccal and palatal were found. A buccal split was suspected and then it was scouted using an 8K and 10K files.

The treatment was performed under magnification, using a dental operative microscope, which proved to be really helpful because of better magnified view and good illumination. Fig 5

Shaping Protocol

Coronal flaring was done using SuperEndo Blue.

10K file was used to instrument the canal till in became loose in both the splits

Working length was determined by using Root zx mini apex locator and confirmed radiographically i.e., MB and DB-19 mm; P-20 mm. Fig 6

Glide path preparation was done with the help of Super Endo Blue File.

The palatal canal and both buccal canals were shaped using SuperEndo Blue upto 25 4% for MB and DB, 30 4% for palatal canal.

Irrigation Protocol

Throughout shaping, 5.25% sodium hypochlorite was used after each file. After shaping, the following protocol in each canal, was used for irrigation and activation of irrigants-

1. Distilled water used to flush the canals.
2. 5.25% sodium hypochlorite-ultrasonic activation.
3. 17% EDTA-1ml per canal-ultrasonic activation.

Obturation Protocol

Canals were dried with paper points.

Master cones were finalised after confirming their tug backs. Fig 7 Bioceramic sealer with single cone was used for obturation. Fig 8 Post Endodontic Restoration

Fiber post and Core build up was done for 25 followed by a full coverage crown was given on 25, 26. Fig 9,10

Discussion

Molarisation of premolars is a rare developmental anomaly in which premolars present with crown morphology resembling molars. Clinically, these teeth demonstrate an unusually large crown, multiple cusps, and a widened occlusal table that mimics a molar form. Such morphology may predispose the tooth to caries, occlusal trauma, and plaque retention due to deep fissures and irregular anatomy.8 Periodontal challenges may also arise from altered crown-root proportion and malocclusion. In the present case, these features complicated occlusal balance and necessitated careful treatment planning.

Radiographically, molarized premolars often show an increased mesiodistal dimension, bulky crown anatomy, and variation in pulp chamber morphology. Root canal anatomy may be atypical, with variations ranging from a single large canal to multiple root canals. These variations have been documented in earlier reports of gemination and macrodontia involving premolars [9]. Conventional periapical radiographs may not fully reveal the complex canal morphology, underscoring the importance of advanced imaging. Cone-beam computed tomography (CBCT) has emerged as a valuable tool in such cases, providing three-dimensional visualization of root and canal systems, helping in precise diagnosis, and guiding endodontic and restorative strategies.

This case was selected owing to its rarity, unique clinical presentation, and the therapeutic challenges it posed. Chronologically, the patient presented with occlusal discrepancies, followed by progressive discomfort due to altered crown morphology. Early recognition enabled timely intervention, preserving vitality and preventing progression to more complicated pathology.

Endodontic management was dictated by the complexity of the anatomy. A single cone obturation technique was employed using a bioceramic sealer to achieve three-dimensional sealing, given its superior flow and adaptability to canal irregularities. In the palatal canal, a post and core build-up was placed to reinforce structural integrity, restore function, and provide adequate support for subsequent restorative procedures. Such an approach is consistent with clinical recommendations for structurally compromised teeth requiring reinforcement [10].

Several studies have highlighted similar anomalies:

- Ebenezar *et al*. reported bilateral geminated mandibular second premolars with molarisation managed conservatively [11].
- Mangla *et al*. described unilateral molarisation of a mandibular
- second premolar requiring restorative modification [3].
- Babaji *et al*. reported a unilateral molariform macrodont premolar that required endodontic management [4].

These findings reinforce the need for individualized treatment, combining conservative and endodontic approaches.

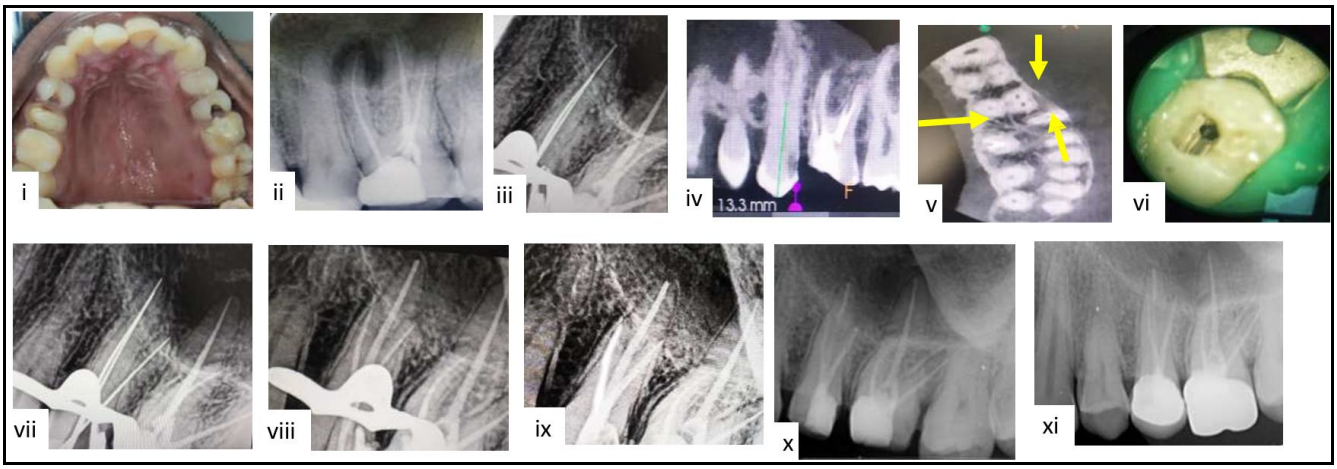

Fig 1: i) Intraoral photograph ii) Pre op radiograph iii) Presence of extra canal iv) CBCT showing split in buccal v) CBCT images Three canals vi) Microscopic photograph vii) Working length viii) Master cone ix) Obturation x) Post and core placed xi) Post cementation X ray after 1 year

Conclusions

In-depth knowledge of variations in root canal anatomy is essential to avoid missed anatomy during endodontic treatment. With the advent of advanced tools such as magnification, illumination, and CBCT, the ability to diagnose and treat atypical anatomy has significantly improved. Nevertheless, a well-interpreted intraoral radiograph can still provide critical insights. Refining the access cavity design plays a pivotal role in identifying extra canals and facilitates efficient instrumentation and obturation.

Pictures

Declaration form

- Ethics approval and consent to participate: Yes
- Consent for publication: Yes
- Availability of data and materials: Yes
- Competing interests: No
- Funding: No

Authors' Contributions: Case done-Dr. Priyanka H Hadimani Write up-Dr. Vedavathi B, Dr. Akshatha Airsangi, Dr. Deepthi

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Conflict of Interest

Not available

Financial Support

Not available

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