



African Journal of Biological Sciences



Preference Of Restoration For Endodontically Treated Teeth(ETT) Among Dental Practitioners– A Questionnaire Based Survey.

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Article History

Volume 6, Issue Si4, 2024

Received: 30 June 2024

Accepted: 17 July 2024

Published: 29 July 2024

Doi:

10.48047/AFJBS.6.Si4.2024.4234-4243

Abstract

Background

Endodontically treated teeth (ETT) should be prosthodontically well managed to enhance the longevity of teeth. Developments in materials and techniques, geographical locations, age, specialty, and affiliations of dental practitioners affect the preference of post-endodontic restoration.

Aim

The aim of this survey is to evaluate the preference of materials of choice in terms of post-endodontic restorations among practitioners in Tamilnadu.

Methodology

An observational study was conducted among 320 dental practitioners in the state of Tamil Nadu. The first section of the survey was concerned about the demographic information and the second half was about the treatment concept and materials of choice for restoring ETT. Descriptive statistics was used to analyze the study results.

Results

Composites resins are the most preferred type of entrance filling. 54.8% of the participants preferred composite resins. 32.5% preferred glass ionomer cement and 11.1% preferred miracle mix. Fiber posts remain the most preferred post type (66.7%) followed by custom cast post and core (14.3%).

Conclusion

The use of pre-fabricated fiber posts, composite resin core and full coverage restoration for restoring ETT is commonly preferred among participants.

Keywords Post endodontic restoration, post, core, crowns, luting cements.

Introduction

Endodontic and restorative therapies significantly enhance the structural stability and functionality of the dental arch, particularly for endodontically treated teeth (ETT). High clinical success rates, generally around 95%, have been documented for endodontic treatments [1]. However, it has been

recognized that the majority of endodontic treatment failures are not due to the endodontic procedure itself but due to subsequent restorative failures [2, 3].

Advancements in dental materials and technologies have expanded the range of options available for post-endodontic restorations. Traditional methods such as crowns and direct restorations remain prevalent [6, 7], while innovative solutions like endocrowns, CAD/CAM fabricated posts, and fiber-reinforced composites are increasingly adopted due to their aesthetic appeal and biomechanical properties that are compatible with natural dentin [8–10]. The selection of these materials and techniques is influenced by factors such as the geographic location, age, specialty, and the professional affiliations of the practitioners [4].

This study aims to assess the preferences for materials and types of restorations used for ETT among dental practitioners in Tamil Nadu, exploring how these preferences are influenced by their professional backgrounds and the technological advancements available [5]. A questionnaire-based survey was conducted with 320 dental practitioners to gather comprehensive data on their preferred methodologies for restoring ETT.

Methodology

A validated survey was circulated among the dental practitioners in the southern Indian state of Tamil Nadu. These participants are contacted electronically via official emails, which include an explanatory letter detailing the study's purpose, instructions, and the authors' information. The survey was successfully administered to 320 registered dental practitioners across Tamil Nadu, with an impressive response rate as 315 of the surveys were completed and returned.

Results

Table 1 – showing the survey outcome.

Questionnaire	Percentages
What are the typical restoration issues you encounter with endodontically treated teeth?	
Adhesive Failures	34.9
Crown Fractures	42.9
Esthetic Problems	17.5
Root fractures	4.8
Clinical experience	
0–5 years	73.8
11–20 years	11.1
6–10 years	7.14
>20 years	7.94
Dental specialization	
BDS	61.9
Endodontics	7.94
Oral pathology	3.17
Oral and Maxillo-facial surgery	2.38
Orthodontics	3.97
Pedodontics	4.8
Periodontics	0.79
Prosthodontics	11.1
Public health dentistry	0.79

Professional Affiliation	
Academician and clinician	23.02
Other	22.2
Private practice	39.7
University academician	15.1
Preferred restoration method for anterior teeth	
Entrance filling alone, if sufficient	30.9
Entrance filling with full coverage	54.8
Post core and crown	14.3
Post endodontic restoration for posterior teeth	
Entrance filling alone	8.73
Entrance filling with full coverage crown	8.25
Post core and crown	8.73
Preferred material for entrance filling	
Composite resin	54.8
Dental amalgam	1.6
Glass Ionomer Cement (GIC)	32.5
Miracle Mix	11.1
Use a Post and core restoration for endodontically treated	
Always (>8/10)	1.59
Occasionally (4-7/10)	42.1
Rarely (1-3/10)	56.4
Preferred type of post for endodontic restoration	
Custom cast post and core	14.3
Fiber post	66.7
Metal posted cemented	9.52
Mental post-Threaded	9.52
Preliminary consideration when choosing a post type	
Aesthetic Requirements	4.8
Anatomical location of the tooth	9.5
Length of the tooth	10.3
Patient factors (Time, Appointments etc.)	4.8
Remaining coronal tooth structures	70.6
Cement preference for luting post	
Glass Ionomer Cement (GIC)	58.7
Resin Cement	95.2
Zinc Phosphate	4.8
Frequently use full coverage crowns	
Always	65.8
Occasionally	26.2

Rarely	7.9
Top choice of crown for anterior teeth	
Acrylic	3.97
All ceramic	85.7
Metal Ceramic	10.3
Type of crown prefer for posterior teeth	
All ceramic	20.6
Full metal	1.59
Mental ceramic	77.8
Favored crown luting cement for endodontically treated	
Glass Ionomercement(GIC)	81.2
Resin cement	14.3
Zinc phosphate	3.97
Factors for restoration surgery	
ETT as abutment for fixed partial denture	2.38
Economic factors	3.17
Esthetics	11.11
Functional requirements	0.79
Longevity	0.79
Patient requirements	17.5
Periodontal status	3.2
Remaining tooth structure	55.5
Toot location	5.56
Typical restoration issues	
Adhesive failures	34.9
Crown fractures	42.9
Esthetic problems	17.5
Root fractures	4.76

Fig.1 Depicting the clinical experience of the participants

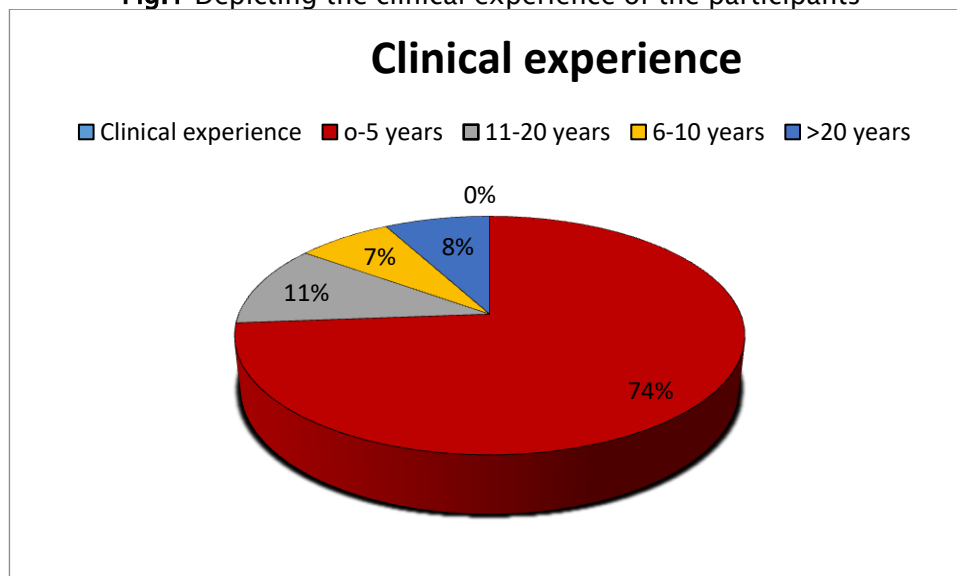
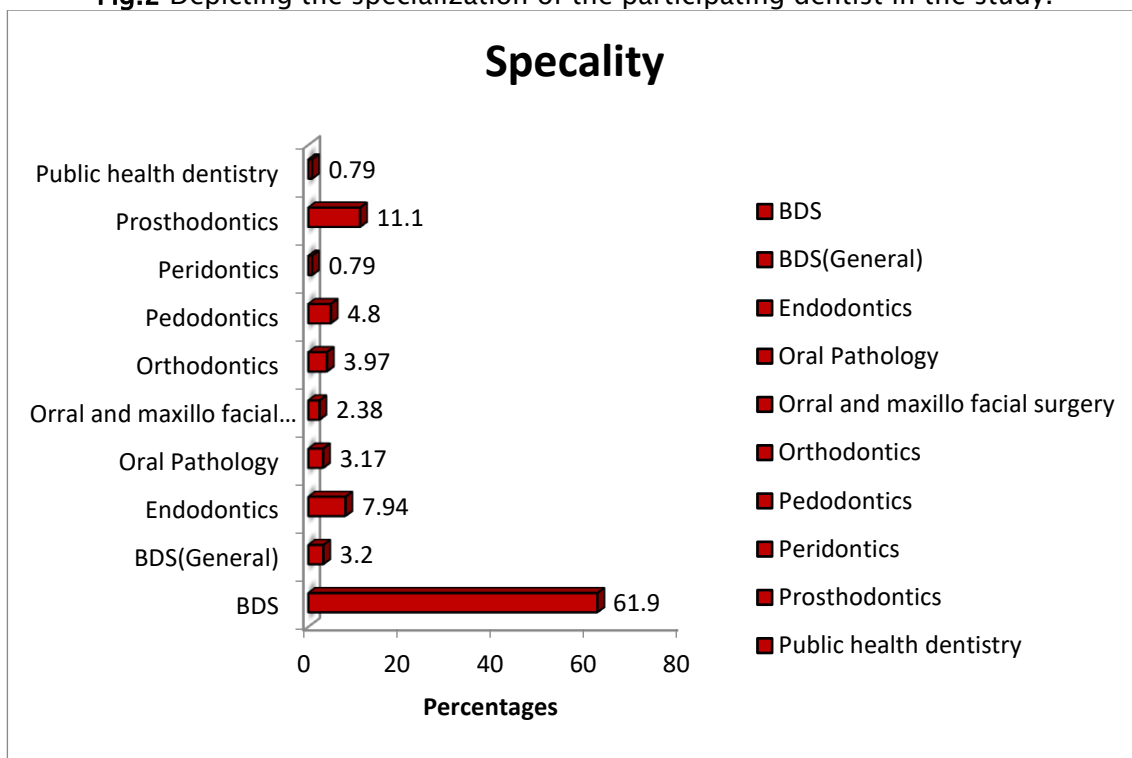
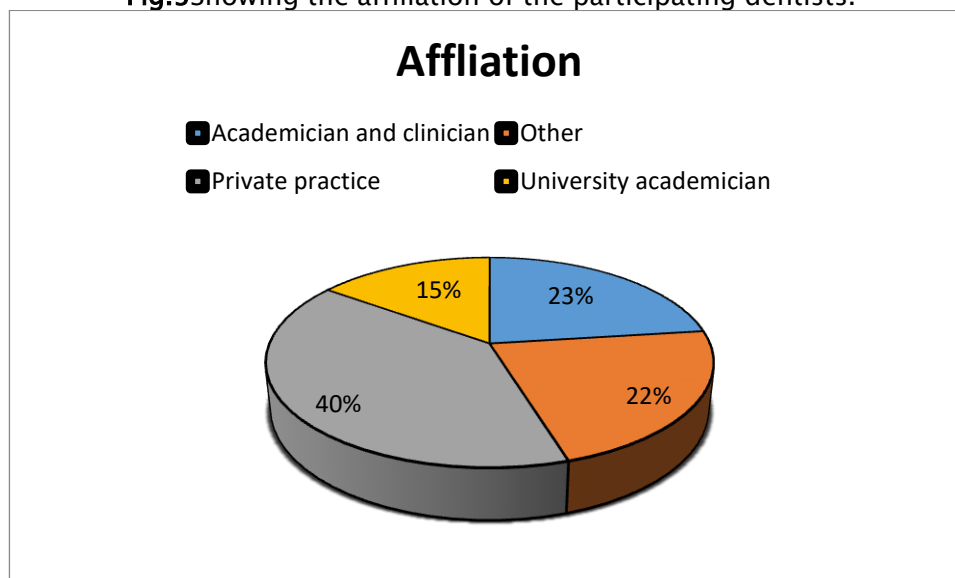


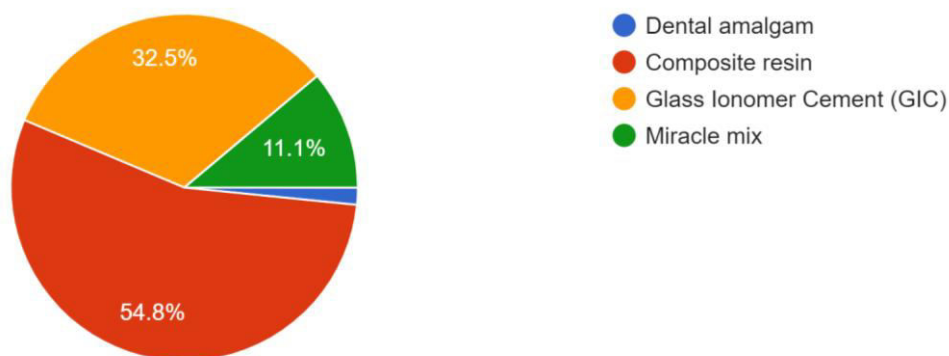
Fig.2 Depicting the specialization of the participating dentist in the study.**Fig.3** Showing the affiliation of the participating dentists.

Demographic data indicated that 73.8% of the participants had less than 5 years of experience, while 7.9% had more than 20 years of experience. Approximately 62% of the participants were general dentists, and 11.1% were prosthodontists. Among the participants, 39.7% were involved in private practice, and 23% were both academicians and clinicians.

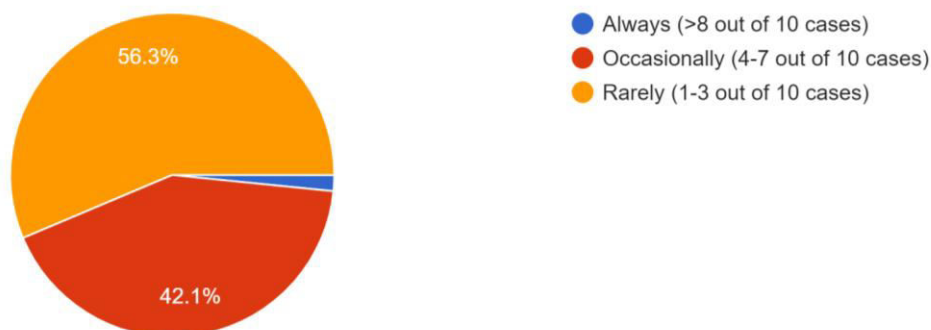
In terms of post-endodontic restoration preferences, composite resins were the most favored type of entrance filling, preferred by 54.8% of the participants. Glass ionomer cement was preferred by 32.5%, and 11.1% favored miracle mix. Regarding the placement of posts following endodontic treatment, 56.3% of the participants reported that they rarely used posts (1–3 out of 10 cases), while 42.1% occasionally use posts (4–7 out of 10 cases). Fiber posts were the most preferred post

type, chosen by 66.7% of participants, followed by custom cast post and core at 14.3%. The majority of practitioners highlighted that the most important factor in post selection is the amount of remaining coronal tooth structure (70.6%). Around 66% of the participants believe it is always better to place a full coverage restoration following endodontic therapy. In terms of factors determining restoration strategy, the most crucial was the remaining tooth structure (55.6%), followed by aesthetic demands (17.5%), and patient requirements (11.1%). Lastly, regarding failures associated with endodontic treatment teeth (ETT), crown fracture was the most common cause of failure at 42.9%, followed by adhesive failure (34.9%).

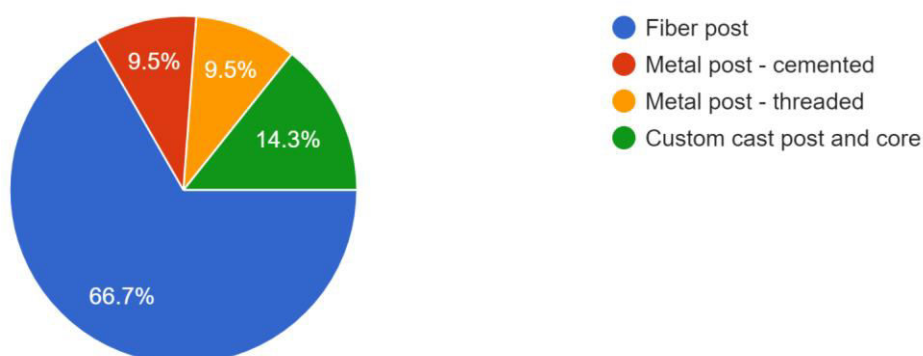
What is your preferred material for entrance filling?



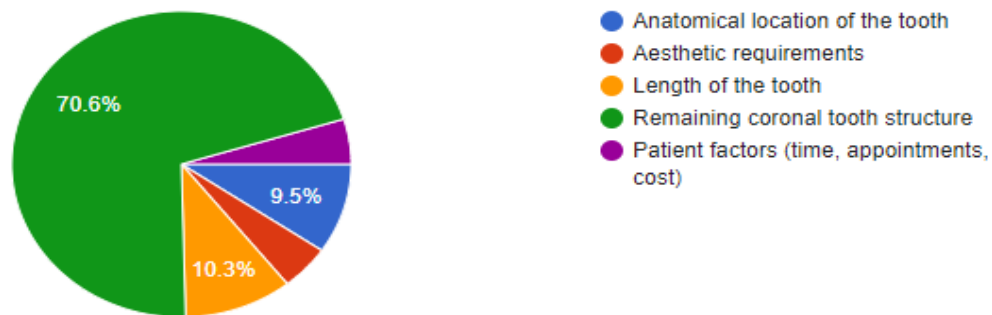
How often do you use a post and core restoration for endodontically treated teeth?



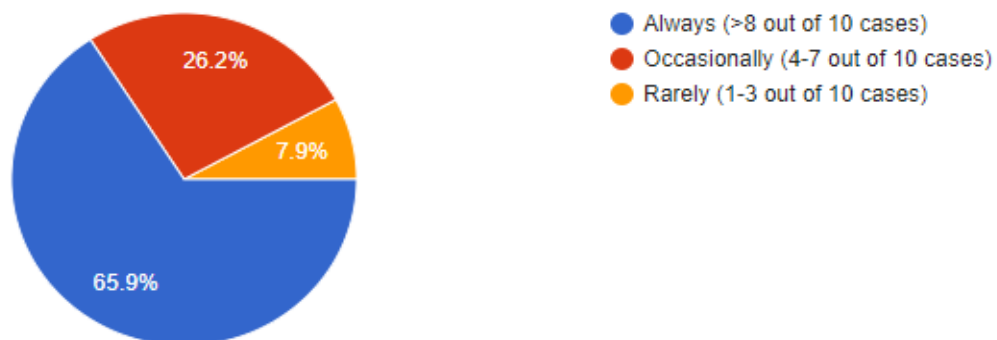
What is your preferred type of post for endodontic restorations?



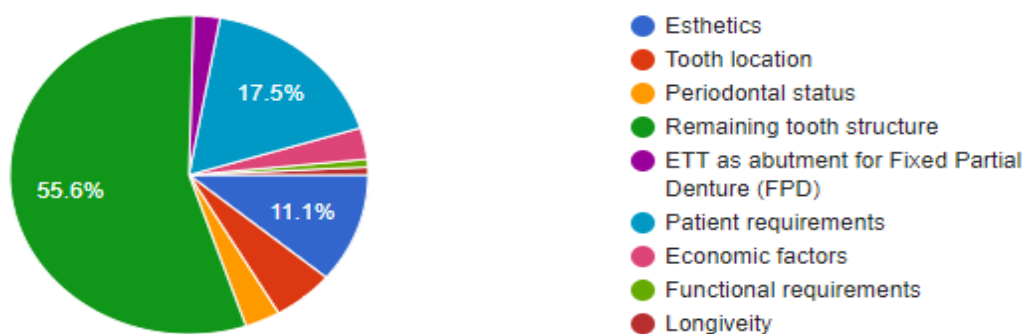
What is your primary consideration when choosing a post type?



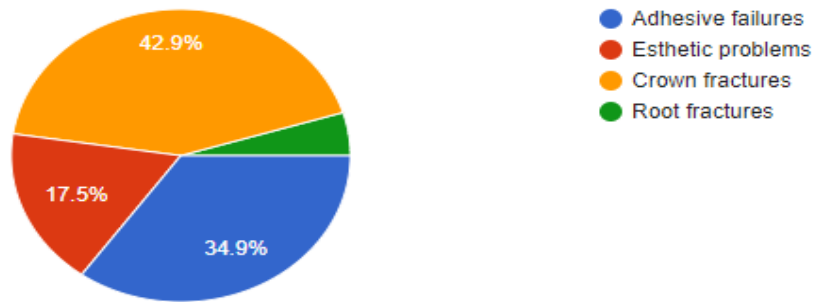
How Frequently Do You Use Full Coverage Crowns for Endodontically Treated Teeth?



What factors determine your restoration strategy?



What are the typical restoration issues you encounter with endodontically treated teeth?



Discussion

Ray and Trope's seminal investigation on the influence of coronal restoration quality versus root canal obturation on periapical health revealed that the integrity of the coronal restoration plays a more pivotal role in the healing of apical periodontitis than the quality of the endodontic treatment itself[13]. This insight underscores the paramount importance of high-quality final restorations in achieving successful outcomes in endodontically treated teeth (ETT).

The decision-making process regarding the most appropriate final restoration for ETT is complex. While posts are traditionally utilized to retain core material within the tooth, the necessity and type of post placement—including the design and material of the post—continue to stir debate within the dental community[14]. For anterior teeth and molars, the preference leans towards prefabricated fiber posts, followed by cast post and core. However, the use of cast post and core in anterior teeth might clash with the contemporary preference for all-ceramic restorations, highlighting a trend towards more aesthetic and less invasive treatment options.

Surveys conducted in Germany and Saudi Arabia reflected a preference for prefabricated glass-fiber posts, which are favored for their simplicity and effectiveness[15,16]. Conversely, research from Sweden, the United States, and the United Kingdom has shown a stronger inclination towards cast post and core[17–19], illustrating the diverse approaches based on geographic and possibly cultural differences. These varying preferences highlight the dynamic nature of dental practice, which continually evolves in response to advancements in dental materials and new research outcomes from both in vitro and clinical studies[20].

Composite resins, preferred by 54.8% of respondents in this study, emerged as the top choice for post-endodontic restorative material. Although traditional post-and-core restorations are deemed necessary for teeth with significant structural loss[21], the shift towards using restorations without post-and-core setups is becoming more prominent. This shift is driven by the desire for minimally invasive procedures that maximize the preservation of tooth structure, enhanced by improvements in adhesive technologies and clinical techniques[22]. Studies have shown that resin composite restorations can achieve excellent success rates in teeth that retain adequate structure[23]. Additionally, the integration of digital fabrication technologies like CAD/CAM has revolutionized post-endodontic restorations by enhancing mechanical strength, eliminating porosity, and significantly reducing the time patients spend in the dental chair[24].

In the selection of restoration patterns, the quantity of remaining tooth structure is again the predominant determinant factor, influencing over half of the decisions (55.6%). Coronal fractures are the most frequently encountered complications in post-endodontic restorations, accounting for 42.9% of failures. This finding mirrors outcomes from a comprehensive survey conducted across Turkey, which also emphasized the protective benefits of cusp coverage in redistributing stress and prolonging the life of the restored tooth[4]. While there's a consensus on the benefit of full-cusp coverage for extensively damaged teeth, opinions differ regarding its necessity across all

endodontically treated teeth[26]. This highlights the ongoing debate about the extent of restoration required, which often depends on the degree of loss of tooth structure.

Despite its insights, the study is not without limitations. The reliance on self-administered questionnaires introduces potential biases such as the tendency of participants to provide socially desirable answers or to misinterpret questions, which might not truly reflect clinical reality.

Looking ahead, further research could explore the decision-making capabilities of dentists more explicitly through scenario-based assessments. Such studies could provide a foundation for extensive, practice-based research aiming to evaluate common practices and material choices among dentists and correlating these with clinical outcomes, thereby enhancing the evidence for post-endodontic treatment strategies.

Conclusion

In conclusion, the findings from this study highlight that the preference of endodontic posts, composite resin cores, and full coverage restorations are prevalent practices among the participating dentists for restoring endodontically treated teeth (ETT). This underscores a trend towards employing robust restorative strategies that aim to ensure the longevity and functional integrity of treated teeth. The preference for these methods reflects the current understanding within the dental community of the need for durable and aesthetically pleasing results in post-endodontic treatments.

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