



Clinical Perspective and Preferences of Dentists on Crown Removal Techniques

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KEYWORDS

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ABSTRACT:

Introduction:

Crown removal is an essential procedure in restorative dentistry that demands precision, efficiency, and preservation of tooth structure. Advancements in materials and technology have diversified removal techniques ranging from conservative to destructive approaches.

Objectives:

This cross-sectional study aimed to evaluate the clinical perspectives and preferences of dentists regarding various crown removal techniques.

Methods:

A total of 340 dentists across India participated in an online questionnaire survey conducted from July to September 2025. Data were analysed using IBM SPSS Version 26.0, and associations between variables were assessed using Pearson's chi-square test with a significance level of $p < 0.05$.

Results:

Destructive techniques were most preferred (48.5%). Conservative and semi-conservative methods were less frequently used but valued for preserving tooth integrity.

Conclusions:

The findings emphasize the need for increased adoption and training in minimally invasive, conservative crown removal techniques.

1. Introduction

Crown removal is a clinical procedure in restorative dentistry, demanding a delicate balance of precision, technology, and patient centered care. Success requires both clinical artistry and expertise, as the dentist must

efficiently take off the existing restoration while simultaneously preserving tooth structure, ensuring patient comfort, and minimizing procedural trauma.¹

As restorative materials have evolved from traditional porcelain-fused-to-metal crowns to contemporary all-



ceramic and zirconia , crown removal techniques have similarly advanced, prioritizing minimally invasive and conservative approaches.² The need for removing the permanently cemented restorations include the development of secondary caries , cementation failures , incorrect fit , aesthetics failures and fractures. Based on their level of invasiveness and potential for preserving the underlying tooth, these techniques are broadly categorized into more conservative , conservative, semi-conservative, and destructive categories.³

More conservative techniques aim to disintegrate the luting cement layer without damaging the prosthesis and tooth structure , allowing for its re-cementation. Examples include ultrasonic vibration system, Richwill FPD remover which employs thermoplastic adhesion⁴, trial crown tractor removers and lasers. Conservative methods, such as resin coping , chisel and sliding hammer remover , back-action crown removers and crown tapper systems, rely on controlled percussive or traction forces to detach the prosthesis while maintaining its integrity. Semiconservative techniques like the WAMkey , Kline, and Mtlift systems combine mechanical precision with reduced invasiveness by creating a small access point within the crown and applying controlled lifting forces .In contrast, the destructive technique, which involves sectioning the crown or bridge using an airtor bur, remains widely practiced when the restoration is irretrievable . This technique is also chose when the crown is badly damaged or when there in a need of a new prosthesis .

The choice of technique depends on multiple clinical factors, including the type of cement, the restorative material, the condition of abutments and surrounding tissues, and the clinician’s intent to reuse the prosthesis. Amid this context , the present study aims to explore the clinical perspectives and preferences of dentists regarding various crown removal techniques, while examining how experience, age, and professional judgment influence technique selection in modern prosthodontic practice.

2. Materials and Methods

The study was approved by the Institutional Ethics Committee and the ethical clearance ID is 272/2025/IEC/TMDCH.

This cross-sectional study was designed to assess the clinical perspectives and preferences of dentists

regarding various crown removal techniques. A total of 340 dentists from across India participated in the survey. Data were collected through a structured questionnaire distributed via Google Forms, and participants provided informed consent to ensure confidentiality and voluntary participation. Prior to submission, respondents were briefed on the questionnaire items to enhance accuracy and reliability of responses. The collected data were compiled in Microsoft Excel and statistically analyzed using IBM SPSS Statistics for Windows, Version 26.0 (Armonk, NY: IBM Corp.). Descriptive statistics such as frequencies and percentages were computed. The Pearson’s chi-square test was applied to determine associations, with the level of statistical significance set at $p < 0.05$.

S.NO	QUESTION TEXT	RESPONSE OPTIONS
1	Age of the dentist	25-35 years 36-45 years 46-55 years 56-65 years Above 66 years
2	Educational qualification	BDS MDS
3	If MDS , Specialization in	Prosthodontics Oral and Maxillofacial surgery Endodontics Orthodontics Public health dentistry Periodontics Oral pathology Oral medicine and radiology Pedodontics
4	Frequency of crown removal cases	1 in 10 1 in 20

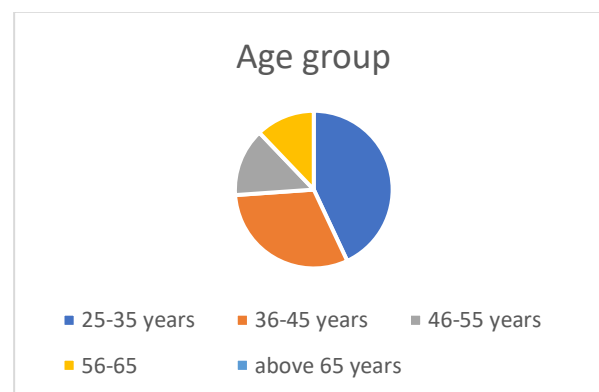


		1 in 30 Even more rare
5	Reason for crown removal	Recurrent caries Incorrect fit Cementation failures Aesthetic failures
6	Treatment plan after crown removal	Extraction , bridge Extraction , Implant RCT + New prosthesis New prosthesis
7	Preferences in more conservative technique	Ultrasonic Richwill fpds remover Trial crown tractors Lasers None of the above
8	Preferences in conservative technique	Crown taper Resin coping Chisel & sliding hammer remover Back action crown remover
9	Preferences in semi conservative technique	MTAlift system Kline system Wamkey system Higa system Bucco lingual dimple technique
10	Preferences in destructive technique	Yes No
11	Most preferred technique	More conservative Conservative Semi conservative Destructive

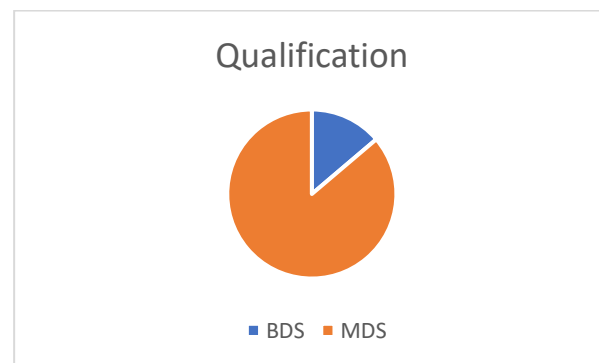
3. Results

A total of 340 dentists participated in the study, comprising 177 males (52.1%) and 163 females (47.9%).

The majority of participants belonged to the **(39.7%) 25–35-year age group, followed by 28.5% in the 36–45-year group, 12.9% in the 46–55-year group, 11.2% in the 56–65-year group, and 7.6% above 65 years.**



In terms of educational qualification, **86.2% were MDS graduates, while 13.8% had completed BDS.**

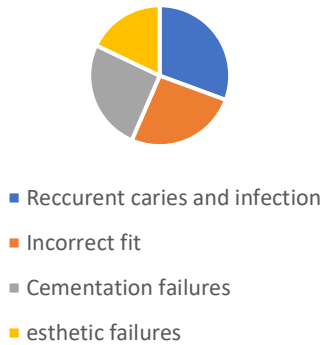


When assessing the frequency of crown removal cases across different age groups, most respondents aged 25–35 years reported encountering such cases once in ten procedures (40.7%), whereas this frequency decreased with advancing age. The Pearson Chi-Square test revealed no statistically significant association between the age of the dentist and the frequency of crown removal cases ($\chi^2 = 11.040, p = 0.526$).

Regarding the most common reasons for crown failures, **recurrent caries and infections (30.6%) and incorrect fit (25.9%)**, followed by **cementation failures (25.6%) and esthetic failures (17.9%)**. No statistically significant relationship was observed between age group and cause of crown failure ($\chi^2 = 15.750, p = 0.203$).

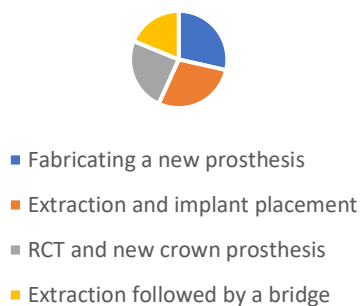


Reason for crown removal failures



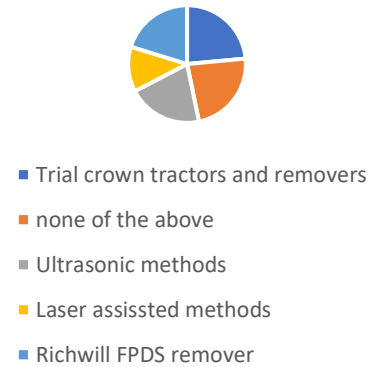
When evaluating the treatment plan preferred after crown removal, **28.5% of the participants preferred fabricating a new prosthesis, 28.2% opted for extraction and implant placement, 24.4% suggested root canal therapy followed by a new crown prosthesis, and 18.8% recommended extraction followed by a bridge.** The association between age and preferred treatment plan was statistically insignificant ($\chi^2 = 12.463, p = 0.409$).

Treatment plan after crown removal



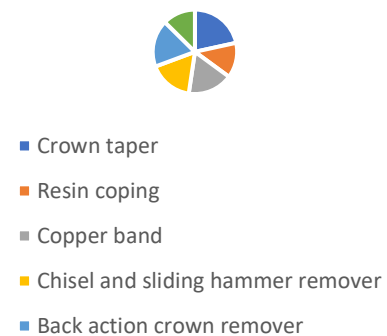
In assessing methods preferred under the *more conservative technique*, the responses varied considerably, with **23.5% favouring trial crown tractors and removers, 23.2% selecting “none of the above,” 20.6% preferring ultrasonic methods, and 12.4% opting for laser-assisted approaches, 20.3 % choosing Richwill FPDS remover.** However, no statistically significant association was observed between age and method preference ($\chi^2 = 18.725, p = 0.283$).

Preferences on MORE CONSERVATIVE technique



Similarly **and sliding hammer remover (17.1%) , resin coping (13.5 %), copper band (17.3 %), back action crown remover (18.1%)** but again, no statistically significant difference was seen between age groups ($\chi^2 = 32.509, p = 0.115$), when evaluating the *conservative technique*, the most preferred options were **crown taper (21.5%) ,chisel**

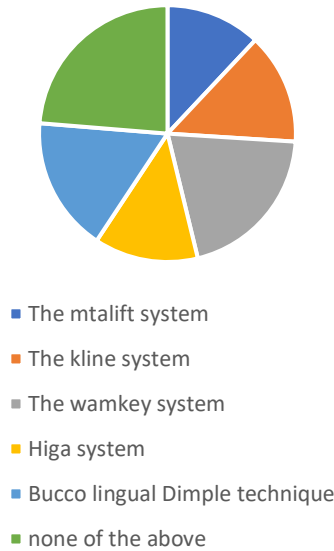
Preferences on CONSERVATIVE techniques



Among the *semi-conservative techniques*, “**none of the above” (23.5%) and the Wamkey system (20.3%), The mtalift system (12%) , The kline system (14%), the higa system (12.6%) and bucco lingual Dimple technique (17%)** were most frequently chosen. Nevertheless, there was no statistically significant correlation between age and choice of semi-conservative method ($\chi^2 = 23.972, p = 0.463$).

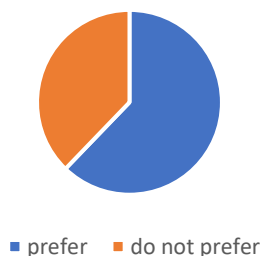


Preferences on SEMI CONSERVATIVE technique



In contrast, when dentists were asked whether they preferred the *destructive technique* (sectioning the crown with a bur), a statistically significant relationship emerged between age and preference ($\chi^2 = 10.201$, $p = 0.037$). **Younger practitioners (25–35 years) reported a higher preference (62.2%) for destructive methods** compared to **older age groups(56 – 65 years) who had a lower preference (42.10%)**, indicating a possible generational variation in clinical approach.

preferences on DESTRUCTIVE technique



When examining the overall technique preference, nearly half of the **respondents favoured destructive technique (48.5%)**, followed by **conservative technique (21.5%)**, **more-conservative technique (15.6%)**, and **semi-conservative (14.4%) techniques**. However, this

distribution did not differ statistically significant across age groups ($\chi^2 = 18.511$, $p = 0.101$).

Overall preferred techniques

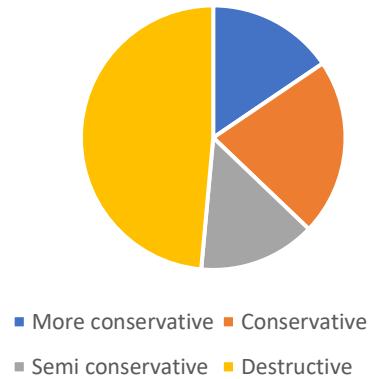


Table 1 : Demographic characteristics of participants

Variable	Category	Frequency (n)	Percentage (%)
Age of the dentist	25-35 years	135	39.7
	36-45 years	97	28.5
	46-55 years	44	12.9
	56-65 years	38	11.2
	Above 66 years	26	7.6
Gender	Male	177	52.1
	female	163	47.9
Educational qualification	BDS	47	13.8
	MDS	293	86.2



Table 2 : Association between age of dentist and clinical parameters

Parameter	X ² value	P - value	Statistical significance
Frequency of crown removal cases	11.040	0.526	Not significant
Most common reason for crown failures	15.750	0.203	Not significant
Treatment plan after crown removal	12.463	0.409	Not significant
Method preferred in more conservative technique	18.725	0.283	Not significant
Method preferred in conservative technique	32.509	0.115	Not significant
Method preferred in semi conservative technique	23.972	0.463	Not significant
Preference for destructive technique	10.201	0.037	Significant (p < 0.05)
Overall preferred technique	18.511	0.101	Not significant

4. Discussion

This study provides valuable insights into the practical choices made by dental practitioners concerning crown removal methods and the influence of demographic variable i.e. age . In our analysis, destructive techniques, particularly sectioning the crown with a bur, emerged as the most preferred approach (48.5%), with a statistically significant association observed with age (p = 0.037), indicating that younger practitioners were more likely to favour this technique. This finding aligns partially with the observations of Dr. Priyanka V. Sutariya et al., who

reported that the airtor - bur (destructive) method was the most frequently chosen option (around 40%), followed by gun-type and sliding hammer removers, while conservative devices like band and pneumatic systems were less commonly used.⁵ The preference for destructive techniques across multiple studies highlights their working techniques, speed, and reliability, particularly in cases where crown reuse is not a priority. However, this approach compromises the integrity of the underlying tooth structure and precludes restoration reuse, as highlighted by Addy & Hayes , who emphasized the risk of tooth damage associated with sectioning the crown. Conversely, our results revealed that a notable proportion of dentists still considered conservative and semi-conservative methods, such as ultrasonic, laser-assisted, and mechanical systems (e.g., WAMKEY, Mtlift), albeit without significant differences across different age groups.⁶ This growing interest aligns with recent advances in which it was demonstrated that newer laser and ultrasonic techniques provide faster, more comfortable, and less forceful crown or veneer removal often within five minutes especially advantageous for all-ceramic or complex restorations⁷ .There are various studies which shows the preferences of crown removal among the current generation dentists chose destructive crown removal technique. Similarly, another study reveals that both manual back-action and spring-loaded removers achieved high success rates (>85%), with manual systems showing fewer adverse outcomes such as crown chipping and tooth fractures, and allowing higher rates of crown reuse. The increasing appeal of such conservative systems corresponds to the global trend toward minimally invasive dentistry.⁸ Additionally, literature suggests that the choice of technique is often guided by clinical factors such as crown material, fracture patterns, and underlying tooth condition (McCracken et al., 2016; Santos et al., 2003).^{9,10} In this context, while our study identified a persistent preference for destructive approaches, it also reflected awareness among clinicians regarding alternative conservative modalities that preserve tooth structure. Overall, these findings illustrate the complex balance between procedural efficiency and preservation of tooth structure in restorative dentistry. The predominance of destructive techniques, despite the availability of safer and reusable conservative alternatives, highlights the need for greater clinical training, equipment accessibility, and emphasis on minimally invasive practices in modern prosthodontics.



5. Conclusion

The study reveals that destructive crown removal technique (48.5%) is the most preferred method, especially among younger dental practitioners ($p = 0.037$). This preference highlights the technique's speed and reliability, particularly when crown reuse is not a priority, aligning with other studies.

However, this method risks compromising tooth structure, time consuming and high risk of injury to soft tissues.. Conversely, there is a growing interest in conservative and semi-conservative methods (ultrasonic, laser, mechanical systems) which offer minimally invasive removal, preservation of the tooth, and higher rates of crown reuse. The continued reliance on destructive techniques suggests a need for increased clinical training and accessibility to conservative alternatives

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