INDIAN
ENDODONTIC
SOCIETY

IES TIMES

Official Newsletter of Indian Endodontic Society

INDIAN ENDODONTIC SOCIETY

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Guest Editorial

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Past President, Indian Endodontic Society
Director, Indian Board of Endodontics
Founder, One Dental

Navigating the Future of Dentistry: A Closer Look at Dental Dynamic Navigation

In recent years, the landscape of dentistry has been undergoing a profound transformation, driven by advancements in technology. One such innovation that is revolutionizing dental procedures is dental dynamic navigation. This cutting-edge technology offers precision, efficiency, and improved patient outcomes, ushering in a new era of dental care.

Dental dynamic navigation combines the power of digital imaging, computer software, and real-time tracking to provide dentists with unparalleled accuracy during procedures such as implant placement, endodontic treatment, and complex restorative work. Unlike traditional methods that rely solely on the dentist's skill and judgment, dynamic navigation offers a guided approach, enhancing precision and reducing the margin of error.

At the heart of dental dynamic navigation is its ability to create a virtual 3D model of the patient's oral anatomy. Using advanced imaging techniques such as cone-beam computed tomography scans, dentists can meticulously plan each step of the procedure before even touching the patient. This digital blueprint allows for precise measurements, optimal implant positioning, and customized treatment plans tailored to each individual.

During the procedure, the dentist utilizes a handheld device or a computer interface that displays real-time guidance based on the virtual model. As the dentist manipulates instruments within the patient's mouth, the dynamic navigation system tracks their movements and provides instant feedback, ensuring that every action aligns perfectly with the predetermined plan. This level of accuracy not only reduces the risk of complications but also minimizes surgical time, leading to shorter recovery periods and improved patient satisfaction.

One of the key benefits of dental dynamic navigation is its versatility across various dental specialities. Whether it's navigating complex root canal systems, precisely placing dental implants in challenging anatomical conditions, or achieving optimal occlusion in restorative procedures, dynamic navigation empowers dentists to deliver exceptional results with confidence.

Furthermore, dental dynamic navigation enhances communication between the dental team and the patient. By visualizing the treatment plan in advance and involving patients in the decision-making process, dentists can alleviate anxiety, build trust, and ensure a smoother overall experience.

Despite its undeniable advantages, the adoption of dental dynamic navigation is still in its early stages, with some challenges such as initial costs and training requirements. However, as technology continues to evolve and become more accessible, dynamic navigation is poised to become a standard of care in dentistry, offering a new standard of precision, efficiency, and patient-centricity.

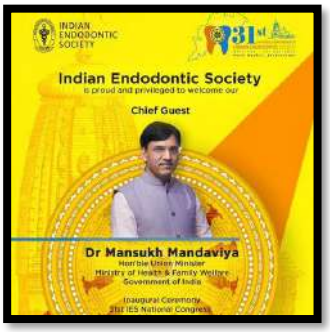
In conclusion, dental dynamic navigation represents a significant leap forward in the field of dentistry, empowering clinicians to achieve unprecedented levels of precision and predictability in their procedures. As this technology becomes more widespread, it promises to redefine the way dental care is delivered, ultimately leading to better outcomes and enhanced patient experience.

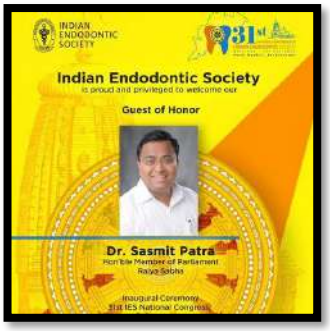
INDIAN ENDODONTIC SOCIETY

Chronicles of success

31st National Conference Extravaganza of the Indian Endodontic Society, Bhubaneswar, Odisha

The 31st National Conference of the Indian Endodontic Society unfurled its grandeur from September 29 to October 1, 2023, hosted by the esteemed Endodontic team of Odisha. This regal event, held at Hotel Mayfair in Bhubaneswar, bore the indelible mark of Dr. Swadheena Patro, the astute Organizing Secretary, and Dr. Saket Rama Rao, the visionary Organizing Chairperson. The conference theme, "Broaden Your Endodontic Horizon," promised not merely knowledge but an expedition into the sublime.





As the curtains ascended, the august presence of our Chief Guest, Union Health Minister Dr. Mansukh L. Mandaviya, and the distinguished Guest of Honor, Dr. Sasmit Patra, Member of Parliament, Rajyasabha, bestowed an aura of distinction upon the gathering. Dr. Sasmit Patro, in his address, acknowledged the brave challenge of hosting the conference in Odisha, recognizing that while it may be more conventional to opt for metropolitan cities, the state rose to the occasion. His satisfaction resonated with the fact that Odisha, with its unique blend of infrastructure, hospitality, and warmth, successfully hosted an event of such magnitude.

The *inaugural event* glittered with the brilliance shared by six eminent international keynote speakers - Dr. Yoshi Terauchi, Dr. Antonis Chaniotis, Dr. Hal Duncan, Dr. Venkateshbabu Nagendrababu, Dr. Arnaldo Castellucci, and Dr. Viresh Chopra. The ensemble of national speakers- Dr. Ramya Raghu, Dr. Vivek Hegde, Dr. Arvind Shenoy, Dr. V Gopi Krishna and Dr. Lora Mishra also illuminated the event.

The gathering transcended borders, with over 900 registered delegates and students converging from every corner of the nation. The scientific sessions held at the esteemed Kalinga Institute of Dental Sciences on September 29, transformed into a space for intellectual exchange. More than 700 postgraduate students and delegates actively took part by presenting their research on various endodontic topics. The subjects ranged from conventional themes to cutting-edge research in endodontics, covering areas like lasers, artificial intelligence, dynamic irrigation, and more. Winners for each session and overall winners were initially chosen based on the quality of their abstracts and ultimately, on the eloquence of their presentations.

Workshop sessions, curated by renowned experts in the field of endodontics, delved into the latest and most cutting-edge topics. One particularly notable workshop, led by Dr. Gopi Kishan, focused on the intricacies of retreatodontics, providing invaluable methodologies for endodontic practitioners aiming to refine their skills and achieve optimal treatment outcomes. Dr. Antonio Chaniotis' workshop offered participants a hands-on experience with HYflex EDM instrumentation, delving into the mastery of root canal treatment.

Additionally, Dr. Viresh Chopra and Dr. Paras Kothari collaborated on a workshop dedicated to separated instrument retrieval using the BTR technique. Their session provided valuable techniques for managing this challenging aspect of endodontic practice. Furthermore, Dr. Vivek Hegde and Dr. V Gopi Krishna conducted a workshop on the mastery of magnification, offering participants an opportunity to enhance their skills in this critical aspect of endodontic procedures. Moreover, Dr. Nikhil Bahuguna led a workshop on biomimetic restoration for both vital and endodontically treated teeth, providing practitioners with innovative approaches to achieve natural-looking and long-lasting results.

The concluding workshop, led by the world-renowned endodontist, Dr. Yoshi Terauchi, unfolded on the last day. The focus was on imparting skills related to minimally invasive and predictable removal of broken files.

The Trade Fair Exhibitions consisted of Thirty-one stalls displaying the latest advancements, products, and services in endodontics. Esteemed sponsors, including SIKSHA 'O' Anusandhan (SOA) University as Knowledge Partner, participated, creating a grand tapestry of connection with industry leaders.

The *scientific sessions* opened with a captivating array of lectures from both National and International luminaries. Dr. Arnaldo Castellucci shared insights on Microsurgical Endodontics. Concurrently, Dr. Terauchi introduced a standardized protocol for instrument removal, emphasizing predictability and minimal invasiveness, utilizing TFRK technology. Dr. Antonio Chaniotis delved into the management of curved canals, while Dr. Hal Duncan explored innovations in Vital Pulp Treatment, discussing scientific advancements and clinical recommendations.

Dr. Venkateshbabu Nagendrababu provided evidence-based strategies for painless root canal treatment. Dr. V. Gopi Krishna, Dr. Lora Mishra, Dr. Viresh Chopra, and Dr. Arvind Shenoy further enriched the symposium. Dr Ramya Raghu demystified vertical fractures, presenting modern concepts in diagnosis and management. Additionally, Dr Vivek Hedge shared insights on endodontic retreatment excellence, embracing the "Yes or No" approach for optimal outcomes. This confluence of esteemed speakers created an enlightening and enriching experience for all attendees.

Following these enriching sessions, the presentations of the top ten **IES Contest finalists** added another layer of intellectual engagement. This showcase of brilliance culminated in the announcement and grand felicitation of the contest winner, adding a celebratory finale to the event.

LIFETIME ACHIEVEMENT AWARD

IES also presented Lifetime Achievement Awards, based on exemplary contributions of individuals to the field of Endodontics. Lifetime Achievement Awards were conferred to –

Dr. Anil Kohli, recipient of the Padma Shri, Padma Bhushan and B C Roy national Awardee. Dr. A.P. Tikku, former Head of the Department of Conservative Dentistry and Endodontics, King Georges Medical University, Lucknow. Professor Sangeeta Talwar, Former Head and currently Senior Professor in the Department of Conservative Dentistry and Endodontics and Principal Investigator Dental Technology Innovation Hub at Maulana Azad Institute of Dental Sciences, New Delhi. The dedication, expertise, and leadership of the awardees have profoundly influenced the advancement of Endodontics, inspiring countless professionals and shaping the future of the discipline.

IES Medal of Honor

In recognition to the outstanding contributions to the advancement and refinement of the field of Endodontics, the Indian Endodontic Society took great pride and privilege in presenting its highest accolade, “The IES Medal of Honor” to Dr. K.S. Banga, Professor & Head of Department of Conservative Dentistry and Endodontics, Nair Hospital Dental College.

ENDO CASE AWARD

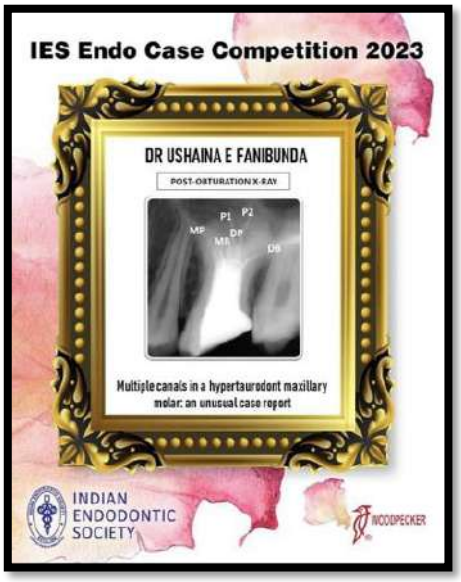
IES organized a case competition, inviting submissions of unique endodontic cases. The top ten finalists were selected based on both, online popularity and evaluation by expert judges, considering clinical skills and presentation. These finalists showcased their cases at the IES National Congress, competing for prizes totalling seven lakh rupees. The Indian Endodontic Society congratulates the winners of the IES Endo Case Competition. Each winner's work served as an inspiration in the field of endodontics. Gratitude was extended to Woodpecker for sponsoring prizes worth *seven lakh rupees* to the worthy winners.

Among the showcased cases, the first prize went to the entry titled "Multiple Canals in a Hypertaurodont Maxillary Molar: An Unusual Case Report by Dr Ushaina E. Fanibunda.


IES Endo Case Competition 2023
EXPERT RECOGNITION AWARDS
First Prize
Dr Ushaina E. Fanibunda
Second Prize
Dr Ankit Arora
Dr Raghavendra P
Third Prize
Dr Ramesh Rajendran
Dr Roheet Khatavkar
Dr.Kshitij Sameer Joshi
INDIAN ENDODONTIC SOCIETY


IES Endo Case Competition 2023
EXPERT RECOGNITION AWARDS
Fourth Prize
Dr Harsh Amlani
Dr Abhishek Mysore Anil
Dr Sourabh Barbhai
Dakshita Joy Sinha
INDIAN ENDODONTIC SOCIETY


IES Endo Case Competition 2023
ONLINE MOST POPULAR AWARD
First Prize
Dr Dakshita Joy Sinha
Second Prize
Dr Harsh Amlani
Third Prize
Dr.Kshitij Sameer Joshi
INDIAN ENDODONTIC SOCIETY


IES Endo Case Competition 2023
DR USHAINA E FANIBUNDA
POST-OBTURATION X-RAY
Multiple canals in a hypertaurodont maxillary molar: an unusual case report
INDIAN ENDODONTIC SOCIETY

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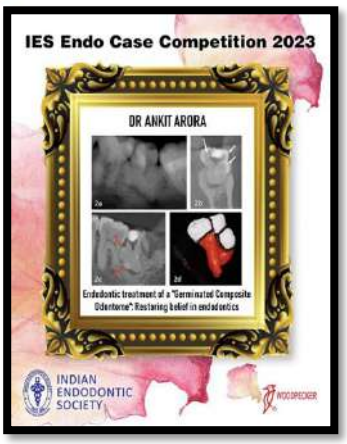

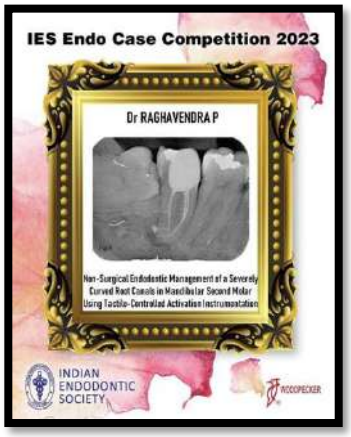

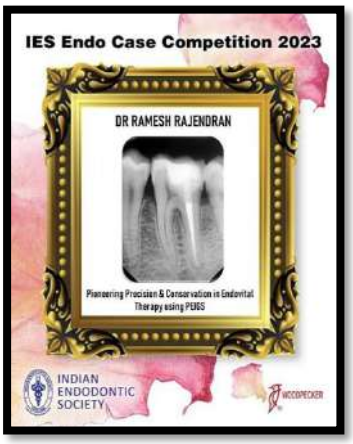

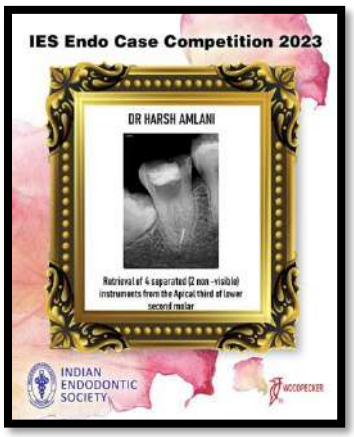

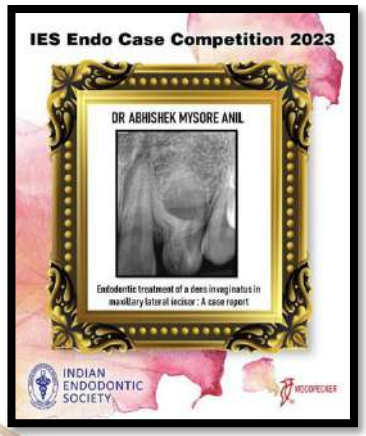

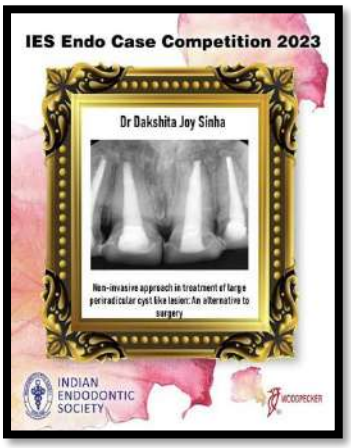

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INDIAN ENDODONTIC BOARD RECOGNITION

Established in 2013, the Indian Board of Endodontics (IBE) is the leading certification authority for Endodontics in India, operating under the umbrella of the Indian Endodontic Society – IES (Regd). The mission of the Indian Board of Endodontics (IBE) is to certify individuals who demonstrate exceptional knowledge and skills in Endodontics and related sciences. We aim to acknowledge those committed to lifelong learning, ethical practice, and the advancement of Endodontic science.

As part of our commitment to the profession and the public, we conduct examinations to identify candidates who possess the necessary knowledge, skills, and attitudes to become Diplomates of the Indian Board of Endodontics. Each year, we welcome applications from endodontists seeking certification. This year, we proudly recognise Dr. Yoshi Terauchi and Dr. Arnaldo Castellucci as recipients of the prestigious Indian Endodontic Board Honorary (IBE) recognition. Furthermore, we congratulate Dr. Shilpa Jain for achieving Diplomate status after successfully completing both segments of the examination.

APPRECIATION AWARDS

Appreciation awards were conferred upon the **Editorial Board** for their significant contributions to the **Endodontology journal.**

IES extends heartfelt congratulations to all authors honoured with the Endodontology Awards for the year 2022:

In vitro research category:

"Histologic evaluation of dentin bridge formation by pachymic acid and biodentine in human tooth culture model" by Khazane Manish Kumar, Mahalaxmi Sekar, and Vidhya Sampath.

"Auto irrigate - The continuous irrigant delivery and intracanal aspiration system" by Garain Ridyumna, Pai Veena S., Krishnakumar G. R., Bharathi M, Vedavathi B, and Karim Jibin.

Clinical research category:

"Proximity of the mandibular anterior root apices to the buccal bone surface: A cone-beam computed tomographic study" by Gupta Isha, Shetty Neeta, Ahmed Junaid, Mala Kundabala, and Natarajan Srikant.

Case report/series research category:

"A simplified and cost-effective targeted endodontic guide for calcified canal negotiation and surgical management" by Pradeepa MR, Rahul B, Valliappan CT, Sherwood I Anand, Gutmann James L, Subramani Rathna Piriyanga, and Sivakumar A Andamuthu.

IES also extended its sincere appreciation to the outstanding reviewers who have supported the journal with their exemplary inputs:

- Dr N Velmurugan
- Dr Namith Rai
- Dr Raj Kumar Narkedamalli
- Dr Paras Gehlot
- Dr Sidhartha Sharma

Editorial Team of the **IES Times** led by Dr Vineeta Nikhil, was also honored for their commendable efforts in disseminating valuable information and updates within the endodontic community. These awards underscore the importance of collaborative efforts and commitment to IES.

After the award ceremony, the night was followed by a banquet at the majestic Orchid Hall of Mayfair Lagoon. Traditional Odissi dance performances and Odia songs elevated the atmosphere, turning the banquet dinner into a sumptuous feast enjoyed by delegates and postgraduates amidst an ambience of grandeur.

GALA BANQUET

After the award ceremony, the night was followed by a *banquet* at the majestic Orchid Hall of Mayfair Lagoon. Traditional Odissi dance performances and Odia songs elevated the atmosphere, turning the banquet dinner into a sumptuous feast enjoyed by delegates and postgraduates amidst an ambiance of grandeur .

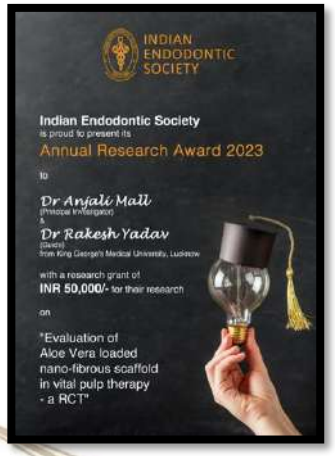
In the grand finale, *the valedictory ceremony* unfolded as a majestic crescendo, acknowledging not just organizational prowess but the dedication behind each endeavor. Certificates were bestowed upon the overall winners of paper and poster presentations. Dr. Swadheena Patro, the Organizing Secretary, delivered a stately vote of thanks, officially drawing the curtain on the grand spectacle of IESCON2023, a memory etched not just in minds but also in the annals of grandeur.

Indian Endodontic Society Unveils Recipients of the IES Annual Research Grant Award 2023

The Indian Endodontic Society takes immense pride in unveiling the triumphant recipients of the esteemed IES Annual Research Grant Award 2023, a testament to the relentless pursuit of excellence in dental research.

This distinguished accolade has been conferred upon four exemplary research projects, each receiving a grant of INR 50,000. This initiative reflects the society's unwavering commitment to nurturing impactful academic research, ultimately enriching and advancing the realm of endodontics.

The IES Annual Research Grant Award 2023 stands as a beacon, illuminating the path for dedicated researchers to make significant strides in the understanding and enhancement of our specialty.



IES CARES

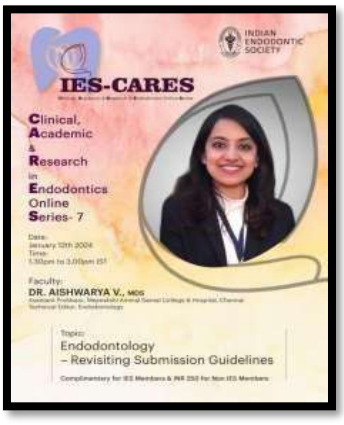
The Indian Endodontic Society takes pride in conducting the IES CARES (Clinical, Academic & Research in Endodontics Online Series), a comprehensive resource repository designed to benefit all life members of IES. This initiative aims to foster continuous learning and professional development within the endodontic community

The sixth program in this esteemed online series was successfully conducted, featuring a distinguished guest lecture by renowned researcher Prof. Hyeon Cheol Henry Kim on October 26, 2023. The focal point of discussion revolved around emerging research methodologies concerning the utilization of Nickel-Titanium in endodontic procedures.

Furthermore, the seventh IES-CARES online event was hosted on January 12, 2024. Dr. Aishwarya Vasudevan, Technical Editor of Endodontology, delivered an enlightening lecture on "Endodontology - Revisiting Submission Guidelines." Her presentation emphasized the importance of adhering to submission guidelines and avoiding common pitfalls in manuscript preparation.

Building on the success of past initiatives, the eighth program in the IES CARES series featured an engaging guest lecture by Dr. Lisha Jain. This session provided attendees with insights into the latest developments in endodontic research and clinical practice.

Participation in these programs is open to all IES members free of charge, while non-members can access the sessions by paying a nominal fee. Additionally, recordings of the lectures are available on the IES online repository for those unable to attend live sessions, ensuring accessibility and knowledge dissemination. We encourage all members to take advantage of these resources and contribute to the collective knowledge and expertise of our community.



IES'S VISION FOR NATIONAL ORAL HEALTH!!

On Gandhi Jayanti, the Indian Endodontic Society announced the introduction of "Swacch Danth Swacch Bharat" (Healthy Teeth Healthy India) as a core mission commitment towards our nation and society.

"Celebrating Global Smiles: Triumphs of World Endodontic Day Unveiled by IES

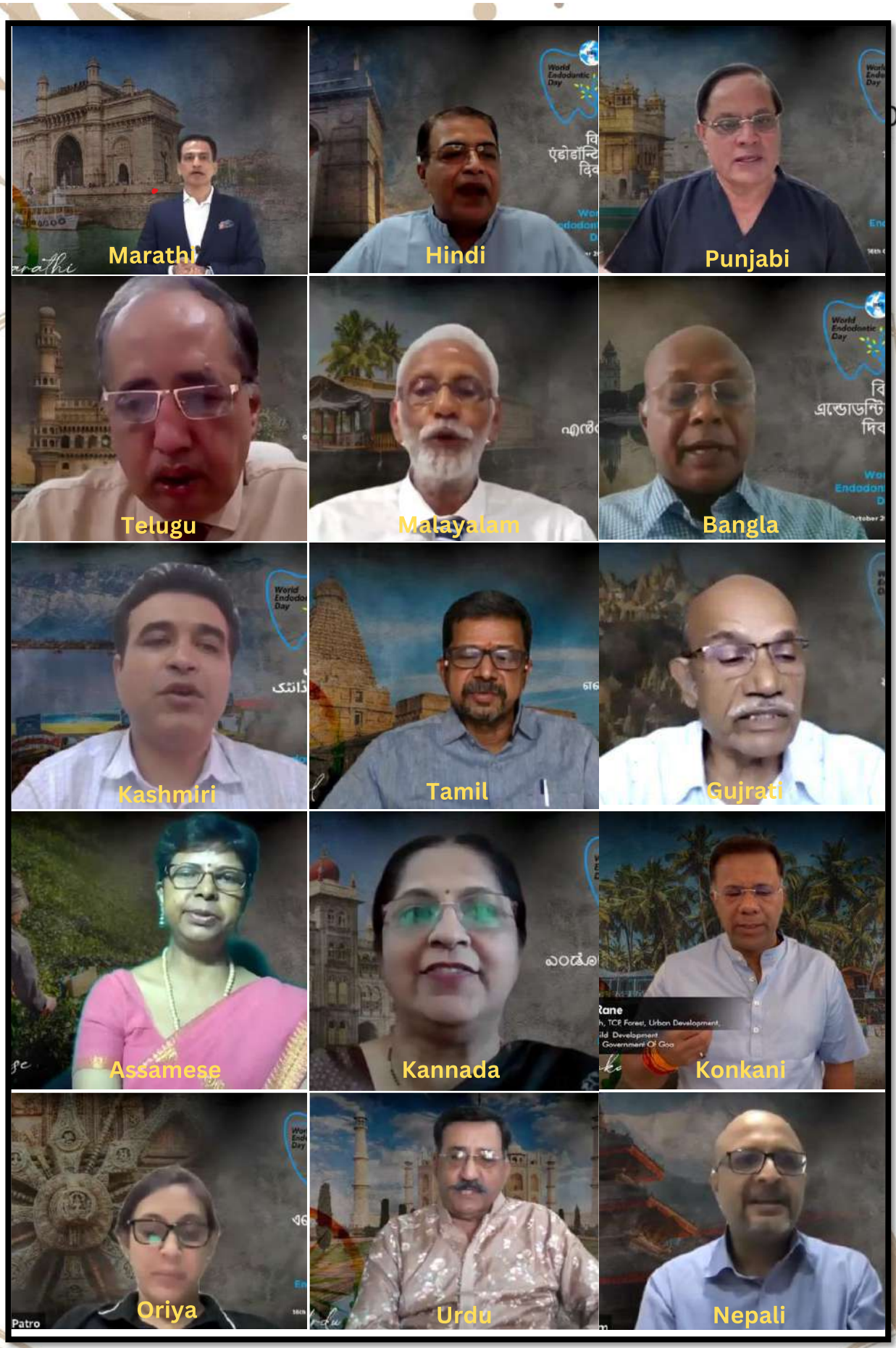
World Endodontic Day, celebrated on October 16, marked a global convergence of over 45 countries under the umbrella of the International Federation of Endodontic Associations (IFEA). In India, the fervor of the day was palpable as the Indian Endodontic Society (IES) orchestrated a vibrant gathering, uniting endodontists from every corner of the nation.

The Indian Endodontic Society orchestrated a series of engaging activities to celebrate and raise awareness about the significance of endodontic care. To infuse a sense of unity among endodontists worldwide, individuals were encouraged to create custom profile pictures promoting World Endo Day on various social media platforms. This initiative aimed to foster a visual representation of support and commitment towards advancing endodontic practices.

The Indian Endodontic Society takes pride in its nationwide campaign across 20 cities of India in 7 languages, utilising FM Radio as the medium to convey the following message: "Endodontists are Dental specialists in saving natural teeth, and we perform predictably endodontic procedures that preserve healthy smiles!!
Our motto: Healthy teeth for a Healthy Nation."

City	Media Name	Language	Frequency	Time Band
Delhi	Radio City	Hindi	91.1	0700-1100 & 1700-2300
Mumbai	Radio City	Hindi	91.1	0700-1200 & 1700-2300
Chennai	Radio City	Tamil	91.1	0700-1100 & 1700-2300
Hyderabad	Radio City	Hindi / Telugu Mix	91.1	0700-1100 & 1700-2300
Bangalore	Radio City	Kannada	91.1	0700-1100 & 1700-2300
Pune	Radio City	Marati /Hindi Mix	91.1	0700-1100 & 1700-2300
Vizag	Radio City	Telugu	91.1	0700-1100 & 1700-2300
Coimbatore	Radio City	Tamil	91.1	0700-1100 & 1700-2300
Madurai	Radio City	Tamil	91.9	0700-1100 & 1700-2300
Lucknow	Radio City	Hindi	91.1	0700-1100 & 1700-2300
Patna	Radio City	Hindi	91.1	0700-1100 & 1700-2300
Jaipur	Radio City	Hindi	91.1	0700-1100 & 1700-2300
Cochin	Radio Mirchi	Malayalam	104	0700-1100 & 1700-2300
Trivandrum	Radio Mirchi	Malayalam	98.3	0700-1100 & 1700-2300
Chandigarh	Radio Mirchi	Hindi	98.3	0700-1100 & 1700-2300
Bhopal	Radio Mirchi	Hindi	98.3	0700-1100 & 1700-2300
Panaji/Goa	Radio Indigo	English	91.9	0700-1100 & 1700-2300
Pondicherry	Radio Mirchi	Tamil	104	0700-1100 & 1700-2300
Bhubaneshwar	Radio Choklate	Odia/English	104	0700-1130, 1300-1700&1800-2300
Delhi	Radio Air Rainbow	Hindi	102.6	0700-1100 & 1700-2300
Delhi	Radio Jamia	Hindi / English	90.4	1600 and 2000

IES celebrated World Endodontic Day with great enthusiasm by incorporating heartfelt messages from senior endodontists representing various states, delivered in 15 diverse languages. This thoughtful gesture not only underscores the significance of oral healthcare but also highlights the pivotal role of endodontics in preserving dental well-being. By presenting a special public service message in various languages of India, IES has demonstrated its commitment to inclusivity and unity in promoting dental health awareness. These messages, sent by eminent teachers, administrators, and clinicians from different corners of the country, beautifully articulate the importance of celebrating #WorldEndodonticDay on October 16th, 2023.


Marathi
Hindi
Punjabi
Telugu
Malayalam
Bangla
Kashmiri
Tamil
Gujrati
Assamese
Kannada
Konkani
Oriya
Urdu
Nepali

The grandeur of this celebration echoed across more than 80 print articles in newspaper India, shining a spotlight on the paramount importance of oral health.

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Celebrations and activities took place *at various colleges*, including walkathons, street plays, students promoting oral health and saving teeth, poster and drawing competitions, rangoli making, and many more, all in commemoration of World Endodontic Day. These events not only fostered awareness about the importance of dental care but also highlighted the significant role of endodontics in preserving dental health. Through engaging and interactive activities, students and participants actively contributed to spreading the message of maintaining healthy smiles and emphasising the importance of oral hygiene practices.

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SUBHARTI UNIVERSITY
DEPARTMENT OF CONSERVATIVE DENTISTRY AND ENDODONTICS, SUBHARTI DENTAL COLLEGE AND HOSPITAL
International Federation of Endodontic Associations
KIMS DENTAL COLLEGE,ANDHRA PRADES
KIMS DENTAL COLLEGE AND HOSPITAL
DEPARTMENT OF CONSERVATIVE DENTISTRY AND ENDODONTICS
ORLD ENDODONTIC DAY - 16TH OCTOBER
GDC - CHENNAI
ORLD ENDODONTIC DAY - 16TH OCTOBER
New Horizon Dental College, Bilaspur
DONTIC DAY - 16TH OCTOBER
KVG DENTAL COLLEGE,KARNATAKA
KVG DENTAL COLLEGE AND HOSPITAL
KURUNJIBHAG, SULLIA, DAKSHINA KANNADA,
KARNATAKA, INDIA 574327
World Endodontic Day
PROUD
International Federation of Endodontic Associations
SRM Dental College, Ramapuram
ORLD ENDODONTIC DAY - 16TH OCTOBER
Meenakshi Ammal college- Chennai
International Federation of Endodontic Associations
CAUSES OF TOOTH DECAY

Concurrently, the International Federation of Endodontic Associations (IFEA) orchestrated a captivating Global Endodontic Symposium, welcoming dentists from across the globe. Renowned speakers, including Dr. James L Gutmann and Dr. Lars Andersson enlightened attendees on historic milestones and contemporary advancements in endodontic procedures and trauma management. The symposium, held on October 16, 2023, in commemoration of World Endodontic Day, provided a platform for exchange and learning, transcending geographical boundaries.

Gratitude abounded as the IES extended heartfelt appreciation to all participants for their enthusiastic engagement and unwavering dedication in celebrating World Endodontic Day, underscoring the collective efforts in promoting dental health and awareness across the nation.

Tête-à-tête with maestro

Dr. Paul Abbott

BDSc W.Aust., MDS Adel., DDSc W.Aust., FRACDS(Endo), FPFA, FADI, FICD, FACD, FIADT.

Emeritus Professor of Dentistry

The University of Western Australia

1. Dr. Paul Abbott, you have excelled as an academician, researcher and author. Can you tell us about your research and academic journey?

Thank you for your very kind comments. My interest in both research and academic work was stimulated when I was doing my Master's degree at the University of Adelaide to train as a Specialist Endodontist. I was extremely fortunate to have fantastic teachers and mentors who were more like friends to me even though I was a student and they were staff. I was also very fortunate that the topic of my research was not only something that had intrigued me since I was an undergraduate dental student but it also fitted in with other research being done by my supervisors. It was a very clinically relevant topic – largely about how intracanal medicaments work. We investigated the diffusion of the active components of a root canal medicament (Ledermix paste) through root dentine to reach the peri-radicular tissues. I was also stimulated and helped by my supervisors to publish the results of this work which led to five journal articles. As part of my Master's program, I had to teach undergraduate students and this led to my subsequent desire to continue teaching throughout the rest of my career.

2. Who has been your mentor during your early academic years?

I had two mentors during my postgraduate training at Adelaide University. My clinical endodontic supervisor/mentor was Professor Geoffrey Heithersay and my research supervisor/mentor was Professor Rory Hume. Prof. Heithersay was an Endodontist working mainly in private practice but with a part-time University appointment where he was teaching and undertaking research (especially about external invasive resorption at that time). His working model with a mix of practice and academia had great appeal to me and I followed this model by working in Perth and then in Melbourne for almost 20 years before becoming a full-time academic back in Perth in 2002. Prof. Hume was a full-time academic who also did some part-time clinical practice. Apart from his teaching and research work, he was also a very effective role model as an administrator as he has held various positions as Departmental Chair, Dean and Vice Chancellor in several universities. When I became Dean of our School, I was able to model my work on Prof. Hume's approach to managing such an organization.

3. Which are your areas of research. What led you to research the intriguing areas of dentistry like dental trauma and tooth resorption?

My research has been largely based around the topics of dental traumatology, tooth resorption, and the diagnosis and management of pulp, root canal and peri-radicular conditions, with particular emphasis on pain control and disinfection of the root canal system. My early work on medicaments led to further work on trauma and resorption – in particular, the use of Ledermix paste for the prevention and management of external inflammatory resorption. In addition, my work on diagnosis and classifications of pulp, root canal and peri-radicular conditions also led to investigations regarding the diagnosis of trauma and resorption. They are intimately related when working as an Endodontist but also when teaching students and dentists. It is essential that we all have the knowledge and a good understanding of the various disease processes that we are trying to diagnose – once we have that knowledge and understanding, then diagnosis becomes easier and more meaningful. However, we need better, simpler and universal classifications of the conditions but this has been lacking in our profession. I have seen this lack as a challenge and I have based some of my research on this theme for endodontic conditions as well as for tooth resorption.

4. You have researched extensively on tooth resorption. Is there any current ongoing research that can help combat post-trauma root resorption?

Tooth resorption is an intriguing topic and one that requires a lot more research. In particular, external replacement resorption and external invasive resorption are the most challenging types of resorption. They are challenging because we do not have sufficient knowledge about them. External replacement resorption has no proven treatment options whilst external invasive resorption has no known aetiology in many cases. Some cases of invasive resorption may have potential predisposing factors that might have contributed to the resorption but we have no clear evidence of how or why this resorption occurs in most cases. There are also varying thoughts and theories about treatment but there is no universal or simple approach to its management – largely because the extent of the resorption varies considerably from tooth to tooth. Both of these types of resorption require further research but this is very difficult since there is no predictable research model (especially for invasive resorption) and it is becoming more and more difficult to do animal research these days due to ethical issues. Hence, sadly, there is very limited research on resorption being reported these days.

5. How do you see technology, such as 3D printing or artificial intelligence playing a role in the future of dental traumatology treatment and diagnosis?

I am certainly not an expert in the area of 3D printing and artificial intelligence! Hence, it is hard for me to predict how these may eventually play roles in the diagnosis and management of dental traumatic injuries. However, I do believe that we need to be cautious as we move forward with these technological things as we are dealing with a patient (i.e. a person!). Perhaps I am a bit old-fashioned, but I believe that dentists must take full responsibility for their patients and the treatment they propose for them. All dentists should still be capable of diagnosing any disease or injury, and they must have the knowledge and skills to manage the problem without relying on technology alone. Artificial intelligence may be able to assist by providing more advanced information or a revision for the dentist while 3D printing might be able to be used for temporary restorations in the emergency situation or more definitive restorations in the longer term.

6. In your opinion, what are the most pressing challenges in dental traumatology that researchers should focus on addressing in the coming years?

I see two large problems in dental traumatology. First is the lack of knowledge among dentists about how to manage dental traumatic injuries. Many surveys from numerous countries around the world have reported a lack of knowledge, or poor knowledge, among dentists when questioned about how to manage various injuries with the management based on the IADT Guidelines. This is possibly a reflection of university training where many dental schools do not devote sufficient time to the teaching of dental traumatology. It is also very difficult for students to gain clinical experience in managing TDI's due to the emergency nature of these cases.

The second major challenge is how to treat ankylosis and external replacement resorption. Ideally, we want to prevent ankylosis and replacement resorption but currently, this is difficult as it relies largely on what the patient, parent or other person does to a tooth when it is avulsed, intruded, etc. Hence, we need to educate the public better but this is very difficult on a worldwide scale. We also need to find ways to treat ankylosis and replacement resorption once they have commenced. Currently, we have no proven methods to manage such a situation and inevitably the tooth will be lost. Given that most TDI's occur in young children and in the anterior maxilla, the inevitable loss of a tooth because of ankylosis and replacement resorption is not only tragic in itself, but it also creates a lifetime of issues and ongoing treatment. It would be a huge step forward if we could find ways to prevent ankylosis and replacement resorption more predictably and also ways to treat them if they do occur.

7. ***You have held many prestigious academic positions and have been the recipient of many awards. Can you elaborate on these?***

I think all Endodontists (and probably all dentists!) have a certain degree of obsessive-compulsiveness about them and I am no exception to this! I have always wanted to do the best I can and excel wherever I could. I think this attitude has helped me to achieve many things in my career. As an academic, the highlight has been to be able to teach many students and I have appreciated those students who have nominated me for various teaching awards.

Certainly, another highlight was to serve as the Dean of our Dental School for 7 years. I have been lucky to receive several awards for my teaching, research, academic work and service to the community. Every award has been greatly appreciated by me but there is no doubt that the award of Officer of the Order of Australia was the highlight. This award is one of the highest awards presented by the Governor-General of Australia and it is based on nominations from the public. I consider this award to be for my family as well as for the dental profession and the speciality of endodontics as much as it was for me. Another highlight has been the establishment of the "Paul Abbott Oration" which is now an annual event in Perth. It was set up by the Dental School along with support from professional organizations such as the Australian Society of Endodontology (WA Branch), the Western Australian Dental Foundation and the Australian Dental Association (WA Branch). It has been funded by many donations from former postgraduate students so it has been an incredible honor to know that my students have appreciated my teaching and mentorship over the years.

8. Can you brief us about your tenure as the Editor-in-chief of the prestigious International Journal of Dental Traumatology?

I was Editor-in-Chief of *Dental Traumatology* for 7 years from 2016-2022 and it was a huge privilege and honor to serve the profession in this role. As you know, I am quite passionate about dental traumatology and being the E-i-C of the journal enabled me to gain greater insight and knowledge in the discipline. One of the best aspects of dental traumatology is that it is very much multi-disciplinary as it involves almost all of the dental specialties. Hence, as E-i-C, I developed relationships with many colleagues from all parts of the world in disciplines outside my specialty discipline of endodontics. This presented me with fantastic learning opportunities as I was exposed to so many people and their varied research interests. Seeing the many case reports was also enlightening. The E-i-C has the advantage of seeing research findings and case reports well before anyone else as the publication process takes some time. Overall, my time as E-i-C was very enjoyable and educational for me.

9. You have lectured widely across over 50 countries. Which is your favourite country you would like to revisit and why?

Yes, I have been very fortunate to have been able to visit so many countries and to meet many wonderful colleagues and people with a great desire to learn from my lectures. It has been a true privilege for me to be able to do this and I have really appreciated all the people who have made these trips possible. As for my favorite country, that is a very difficult question. Perhaps I should say India as this interview is for the IES!! I have been to India 5 times now and I really enjoy visiting your wonderful country. The hospitality is always fantastic and the food is my favorite cuisine – and I love to cook Indian food myself when I am home in Australia. I think it would be fairer to say that I have many favorite countries so it is difficult to single out one… in fact, I have not had any bad experiences in any country I have visited so I would be very happy to visit them all again!

10. Family is a strong support system for any successful person. Dr. Paul, can you introduce us to your family?

Yes, family is very important and I have been blessed to have wonderful support from my family who have allowed me and supported me, in my work and my travels. My wife, Dr Jacqueline Castro, is an Endodontist also and we met when I was visiting Bogota, Colombia as the Keynote Speaker at their annual conference. I have two sons – Geoffrey (40 years old) is an engineer and is also qualified as a schoolteacher. He lives in Canada where he loves all the outdoor sports and activities. Lindsay (38 years old) lives in Perth and he is a Veterinary Surgeon working in a suburban practice dealing mainly with small animals.

11. What are your hobbies and interests besides Dentistry?

I sometimes think that I do not have any spare time to devote to hobbies or other interests outside of dentistry as life always seems so busy! Apart from spending time with my family, I like to do handyman work around our home and also for other people – I have a small shed with all my tools and gadgets, and I try to do as much of the home maintenance work as possible. I enjoy dismantling broken things to try and fix them – and I have reasonable success with most things! I also like to invent or make things that are useful around the home – nothing major although I have made some small items of furniture at times as I like to do woodworking projects. I also like to cook – as I said above, Indian food is a favorite, but I like to experiment with other cuisines also – especially Thai and Italian foods. I have always enjoyed boating on the beautiful Swan River which traverses through my home city of Perth. I owned a small motorboat for several years and now that I am working less, I am thinking of buying another one so I can spend more time on the river!

Overseas Endo

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Learn to excel within your limitations!!!!!

"What after MDS?" – It's the million-dollar question on the minds of postgraduates during their training.

Every postgraduate, particularly those pondering a career abroad, should have answers to the following questions by the end of the first year of their master's program:

i) In which path do I have the most interest and want to pursue? Either to work as a clinician or as a faculty member in an institution;

ii) What is my preferred country of residence?

According to the answers, postgraduates have to prepare themselves during their second and third year of their master's program to be fully prepared for the next stage of their careers.

Clinicians in government settings or private practice

To obtain a position as a clinician in either a public or private clinical setting, postgraduates are required to obtain a license to practice in the country of their choice. To obtain a license, candidates have to satisfy various criteria and often have to clear a board examination of the respective country. However, the eligibility requirements and format of any examination differ across countries. Therefore, postgraduates need to conduct extensive research to understand the eligibility requirements and format of potential examinations in their preferred destination.

Academic positions at universities

An academic position provides opportunities to acquire and impart knowledge to students, as well as prospects for professional development as scientists and clinicians. Academic recruiting committees beyond the assistant professor level at the majority of universities will primarily consider qualifications (PhD is preferred), research potential (as evidenced by publications, grants, and patents), teaching experience, management/leadership experience and clinical experience. It would be advantageous to possess additional scholarly awards, such as a Diplomate or Royal College degree.

Those wishing to pursue an academic career, are advised to devote more time to research during the second and third years of their master's program. This focus on research will allow the experience and knowledge gained to be included in a curriculum vitae upon completion of the master's program. A master's student is often afforded the opportunity to conduct research through the completion of a "thesis dissertation." In my humble opinion, postgraduate students should do well to give greater seriousness to this endeavour and also strive to have their work published in reputed journals as this will demonstrate enthusiasm

and a strong work ethic. If possible, they should also make themselves available to contribute to didactic and clinical teaching programs when the opportunities are available.

Undoubtedly, most overseas universities are seeking faculty members with a PhD. If candidates wish to pursue PhD, they have to decide whether to enroll at a home institution or overseas. If they opt for overseas, a decision is needed on which country and importantly under which supervisor. If you are interested in pursuing a PhD at a specific university, you should thoroughly review the relevant information on the university's website and become familiar with the research programmes and acceptance criteria as well as any financial support that may be available. It would be sensible, in my opinion, to also send an email to your preferred supervisor inquiring about the opportunities for a PhD. It is noteworthy that a PhD is increasingly seen as a necessary prerequisite for faculty membership in many universities.

In addition, apart from society conferences in India, I advise postgraduates to attend endodontic conferences held abroad, such as those of the *European Society of Endodontology* and the *American Association of Endodontists*. In this way, they will be able to be informed of the latest trends by attending lectures delivered by world-class speakers, interacting with them, and exchanging ideas.

A substantial percentage of postgraduates can pass the specialty licensing examination or secure employment in academia on the first attempt. Even if unsuccessful in their initial endeavour, they have to continue their search until they succeed. However, upon retaking the examination or interview, they must assess the elements that contributed to their initial lack of success and make appropriate preparations.

I would like to quote and emphasise the following words by Dr. A.P.J Abdul Kalam, Former President of India (https://en.wikiquote.org/wiki/A._P._J._Abdul_Kalam),

“If you fail, never give up because F.A.I.L. means "First Attempt In Learning".

End is not the end, in fact E.N.D. means "Effort Never Dies".

If you get No as an answer, remember N.O. means "Next Opportunity".

So let's be positive”

Postgraduates in India by their nature are smart, independent, courageous, knowledgeable and multitalented. Most importantly, universities located in India have excellent mentors and infrastructure that allow them to excel in their careers. On the other hand, they may encounter setbacks during their postgraduate career. Please remember, life is all about facing and overcoming these challenges at whatever stage of the journey you are on.

To conclude on a cordial note, postgraduates must focus on the *positive aspects of their lives and learn to excel within their limitations*.

I would like to extend heartfelt thanks to Prof. V Gopi Krishna, Secretary General of the Indian Endodontic Society (IES) and Prof. Vineeta Nikhil, Editor of IES Times for granting me the opportunity to express my thoughts to you all.

Up to the minute

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Dental technological innovations: exploring current trends and potential roadblocks/ barriers

Advancements in dental technology have revolutionized the field of dentistry, leading to improved patient care, enhanced treatment outcomes, and increased efficiency in dental practices. The need for dental innovation has become increasingly crucial, as it addresses various challenges faced by dental professionals and offers solutions that benefit both practitioners and patients.

Increase in the use of robotics, 3-D Printing, adoption of Artificial Intelligence in the dental settings, development of newer and superior dental materials etc. just constitutes the tip of the iceberg amongst the newer and game changing trends which are seeking to revolutionize dental care globally. Increasing awareness, the competitive landscape, access to these progressive technological alternatives is going to be a game changer for the delivery of dental care.

DENTAL INNOVATION IN PRACTICE:

Enhanced Patient Experience: Dental innovations focus on improving patient comfort, reducing treatment time, and minimizing pain and anxiety associated with dental procedures. Advanced imaging technologies, such as cone beam computed tomography (CBCT), allow for precise diagnosis and treatment planning. Digital dentistry techniques, including intra-oral scanners and computer-aided design/computer-aided manufacturing (CAD/CAM) systems, enable faster and more accurate dental restorations, reducing the need for multiple visits.

Precision in Diagnosis and Treatment: Dental innovations offer improved diagnostic capabilities, allowing dentists to detect oral health issues at earlier stages. Digital radiography provides detailed images with lower radiation exposure, aiding in the detection of cavities, periodontal disease, and oral pathologies. Laser technology enables minimally invasive treatments, while 3D printing facilitates the production of customized dental appliances, implants, and surgical guides.

Integration of Technology and Dentistry: The convergence of technology and dentistry has resulted in significant advancements. Artificial intelligence (AI) algorithms can assist in image analysis, aiding in the early detection of oral cancer and other abnormalities. Virtual reality (VR) and augmented reality (AR) are being utilized for patient education, treatment planning, and dental education. Tele-dentistry, enabled by video consultations and remote monitoring, has expanded access to dental care, especially in underserved areas.

Although, dentists have become more receptive to embracing these advancements, these newer treatment options and evolving dental devices and products come at a high financial cost to individuals and the society at large. The rising cost of dental treatment is primarily dependent on the cost of dental equipment, materials, machinery and technical products. The necessity for importing several of these items is a major contributor to this monetary burden. The dental practitioner is always on the lookout to procure cheaper technologies through locally manufactured items. However, the biggest hurdle to overcome is to ensure efficiency, safety, and reliability as comparable to the internationally manufactured and established brands.

PRODUCT CYCLE FOR DENTAL TECHNOLOGICAL INNOVATIONS:

The product cycle for dental technological innovations typically follows a pattern of development, introduction, growth, maturity, and decline. In the development phase, researchers and engineers work on creating and refining new dental technologies, such as advanced imaging systems, robotic-assisted surgery tools, or innovative dental materials. Once a technology is ready for market, it enters the introduction phase, where it is launched and made available to dental professionals and clinics. During this phase, early adopters may embrace the new technology, but widespread adoption is still limited.

As the benefits and effectiveness of the dental innovation become more widely recognized, the technology enters the growth phase. More dental professionals start incorporating the innovation into their practices, leading to increased sales and market penetration. Companies may invest in further research and development to enhance the technology or expand its capabilities to meet evolving needs.

It's important to note that the product cycle can vary depending on factors such as the nature of the innovation, market demand, competition, and technological advancements. Some dental technologies may experience a longer life cycle if they continuously evolve and adapt to meet changing needs, while others may become obsolete relatively quickly in the face of rapid advancements in the dental industry.

Innovation Centers as potential catalyst

Any product development has a long incubation period with involvement of wide range of specialties from ideation to introduction in the market. On top of that, products developed for biomedical applications have to mandatorily fulfill criteria pertaining to regulatory clearances and approvals. A biomedical product has to undergo extensive scrutiny in the form of pre-clinical testing, multi-centric clinical trials etc.

Broadly a biomedical innovation under development includes three stages with Stage I as Rapid Prototyping, Stage II - Calibration, standardization, pre-clinical testing and establishment of limited manufacturing capability; Stage III includes clinical trials and fulfilling pre-requisites for market introduction and dispensation.

In the last decade, indigenous medical device design and development has got attention and is being promoted addressing challenges at different stages. There are centers of innovation operational both at medical and engineering institutes established for the purpose of hand holding innovator/researchers working at various levels.

With regard to Dental science, up till now there has been little work in this area and that too in isolation with major scarcity in terms of basic infrastructure as well as framework of collaborations between the involved stakeholders.

CONCLUSION

The need of the hour is to make quality dental healthcare affordable as well as accessible to the masses. The key to achieving this goal is by encouraging researchers to come forth with innovations to not only improve the quality of care delivered but also to reduce the cost of both products and services.

This requires a dedicated effort to bring all involved agencies on one platform for providing supportive infrastructure and ecosystem so as to assist and facilitate the development of indigenously produced dental technologies. These set-ups can play a major role in providing a conducive environment to achieve these goals by:

•Ensuring availability of dedicated funds, infrastructure and facilities to ensure dental innovation, which can successfully translate into safe, affordable and indigenously produced technologies.

•Enabling collaboration between end-users (dental practitioners and/or patients), technology developers (engineers, technologists), and the market (industry).

•Aiding researchers/ innovators through the full Product Development Cycle from innovative ideas to research prototypes/working models, to clinical testing, validation/calibration of the device, clinical trials and ultimately commercial production and marketing.

•Providing a regulatory mechanism for devices/ instruments.

The need for dental innovation is evident in the transformative impact it has on oral healthcare delivery. Through technological advancements, dental professionals can provide enhanced patient experiences, improved diagnoses, and more precise treatments. The current trends in dental innovation, such as digital dentistry, tele-dentistry, regenerative dentistry, minimally invasive approaches, and personalized care, highlight the progress being made in the field. As dental innovation continues to evolve, it holds the promise of revolutionizing oral healthcare, improving outcomes, and benefiting both practitioners and patients alike.

Teaching-Learning

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Art and Science of Exam writing and facing Viva-Voce

"Trust yourself, you know more than you think you do"
- Benjamin Spock

Studying and preparing is vital to success in exams. Exams can be very stressful for some - they often ask you to cram a whole three years' worth of information into a couple of hour's work. While some students do seem to thrive on last-minute cramming, it's widely accepted that (for most of us) this is not the best way to approach an exam.

Preparing for an exam paper and viva voce (oral examination) requires a systematic approach and thorough understanding of the subject matter. Here are some guidelines to help you with the process:

I. PREPARING TO STUDY:

1. Understand the Syllabus: Begin by thoroughly understanding the syllabus or curriculum for the exam. Identify the key topics and concepts that are likely to be covered.
2. Organize Your Study Materials: Gather all the relevant study materials, including textbooks, lecture notes, reference books, and any additional resources recommended by your instructor. Organize them in a way that makes it easy for you to access information when needed.
3. Seek Clarification: If you have any doubts or questions regarding the subject matter, do not hesitate to seek clarification from your instructor or classmates. Clearing your doubts will enhance your understanding and boost your confidence.

II**. REVIEWING THE INFORMATION**:

1. Review and Summarize: Read through your study materials and make concise summaries of each topic. Use headings, bullet points, and diagrams to aid understanding and retention.
2. Review study guides and sections**:** In some books, each chapter has a short review or summary. This is a great place to quickly review and get a gist of a concept. Of course, if you have no idea what the summary is referring to or you need more details to jog your memory, refer to the study guide in the back of the book. Then, re-read those specific chapters or selections in the book that you were having trouble remembering.
3. Re-read important selections of the textbook: All of the titled sections of the book from your syllabus should be re-read so that you can pull out important information. While you re-read these sections, keep in the mind the major concepts that you're supposed to be learning from those sections of the book. Write down important details as you read.
4. Effective Revision Techniques: Use active learning techniques such as flashcards, mind maps, and self-quizzing to reinforce your understanding and memorize important information.

III. DETERMINING EXAM QUESTIONS:

1. Practice Previous Exams: Obtain past exam papers and practice answering the questions within the allocated time. This will familiarize you with the exam format and help you identify any knowledge gaps or areas where you need further practice.

IV. FORMING STUDY GROUPS:

1. Study with a friend: Get together with a friend or group of people from your class and study together. It doesn't have to be a formal study group. You can simply review each other's notes to see what you may have missed and discuss concepts you think will be covered on the test.
2. Quiz each other: Ask each other potential exam questions. Use your flashcards to quiz each other or ask your friend to make up new questions that you did not think about.
3. Chat about the concepts: Sometimes you can learn more about the information by simply discussing the concepts in a conversation with someone other than your teachers. It may help you understand the information in a different way, and it might even deepen your understanding. Bring snacks for the group or meet at a coffee shop and make the study group more casual, relaxed, and fun.

V. PREPARING FOR THE EXAM:

1. Time Management: Develop a study schedule to allocate sufficient time for each topic based on its importance and your level of understanding. Ensure you have ample time for revision before the exam.
2. Mock Exams: Simulate exam conditions by setting aside a specific time and attempting practice exams. This will help you improve your time management skills, build exam stamina, and identify weak areas that need further attention.
3. On the day of the exam: Set your alarm at least two hours before the test. A good night's rest is the key to better test scores. An hour and a half before the exam, start running through all the themes and sub-topics in your head. Like always, check your notes if you get stuck. Use your flashcards to help you commit all the tiny details to memory if they're not already memorized. Stop studying at least 15 minutes before the exam, but an hour is preferable. If you've given yourself enough time to study, you should feel well prepared and relaxed.

VI. HOW TO HANDLE EXAM DAYS:

1. Be prepared: Start the day with a good breakfast and give yourself plenty of time to get to the exam hall. Remember to take everything you need, including pencils and pens. A bottle of water and some tissues are also useful.

2. Take a few minutes to read the instructions and questions: Then you will know exactly what is expected of you. Ask an exam supervisor if anything is unclear – they are there to help you.
3. Plan how much time you will need for each question: Do not panic if you get stuck on a question, but try to leave yourself enough time at the end to come back to it.
4. Illustrate what you have written, in a diagrammatic format with neat labels. This will help the paper evaluator have a good impression on the candidate, as it indirectly talks about the candidates' understanding of the subject.
5. Once the exam is finished, forget about it. Do not spend too much time going over it in your head or comparing answers with your friends. Just focus on the next exam instead.

FACING VIVA VOCE:

1. Know the Subject Matter: Familiarize yourself with the topics that are likely to be discussed during the viva voce. Review your notes, textbooks, and any additional reference materials.
2. Practice Explaining Concepts: Practice explaining complex concepts and theories in a clear and concise manner. This will help you articulate your thoughts effectively during the viva voce.
3. Prepare Possible Questions: Anticipate potential questions that may be asked during the viva voce. Develop thoughtful and well-structured answers to these questions.
4. Practice Mock Viva Voce Sessions: Conduct mock viva voce sessions with a friend or classmate playing the role of the examiner. This will simulate the actual experience and help you become more comfortable and confident in answering questions orally.
5. Stay Calm and Confident: On the day of the viva voce, take deep breaths and maintain a positive mind set. Remember that you have prepared well, and trust in your knowledge and abilities.
6. Be Respectful and Professional: Maintain a respectful and professional demeanour throughout the viva voce. Address the examiner politely and maintain eye contact during the conversation.
7. A positive affect has a positive effect: Confidence, enthusiasm, positivity and care are seen as characteristics of good candidates by examiners.
8. Listen Carefully: Listen attentively to the examiner's questions and instructions. If you are unsure about a question, seek clarification before answering.

9. Think before Answering: Take a moment to gather your thoughts before answering a question. Structure your response logically and provide relevant examples or explanations to support your answers.

10. Speak like a news-reader: Moderate speech rate should be the aim. Clear speech and good grammar have a positive impact. Good articulation is judged by viva examiners as a positive characteristic, and faltering, a negative one.

11. Punctuate and emphasize speech: Emphasis is an area where speech has an advantage over text. Emphasis can be made not just by the quantity of time given to an issue but also by the candidate's tone of voice. Varying one's pitch enhances perceptions of competence, character and sociability.

12. Demonstrate sophistication and maturity: Examiners will be evaluating candidates' capacity for reflection and synthesis within the discipline's framework. Thus, the candidate needs to know the meaning of the data they are presenting, incorporating it such that it aids diagnosis and/or management.

13. Make the examiners' job easy: It can be a long day for examiners, paying close attention to a steady stream of candidates then having to make high stakes, often difficult, decisions. Hence, organize the content and present a structured discussion to ease examiners through their tasks.

14. When the bell goes: Say 'thank you', stand up and leave the room immediately. Do not grimace, weep or look desperate. Do not thank the examiners for their time. Do not say 'I'm sure I could have done better. Do not shake hands or hang around. Your examiners have to mark your performance and cannot do so while you are within hearing.

Remember, preparation is key. By following these guidelines and dedicating sufficient time and effort to studying and practicing, you can increase your chances of success in both the written exam and viva voce. Good luck!

"Self-belief and hard work will always earn you success."

-Virat Kohli, Indian cricketer

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The 3 Dimensions of Adhesive Post Endodontic Restorations

INTRODUCTION

The contemporary minimally invasive endodontic practice has resulted in saving millions of natural teeth earlier deemed for extraction. Endodontic treatment is largely performed on teeth which are affected with caries, repeated restorations and/or fractures. These structurally weakened teeth are presumed to be further weakened by endodontic access preparations, loss of moisture and biomechanical changes in the root dentin. Non-vital teeth need special considerations for the final restorations with comprehensive treatment planning to restore the health, function and esthetic of the affected tooth and its supporting structures. It is accepted that the quality of restorative treatment performed on endodontically treated teeth (ETT) directly impacts the prognosis and survival of these teeth.

ENDODONTIC SUCCESS VS SURVIVAL

If contemporary endodontic protocol is followed stringently the endodontic success is pitched at 99.6 % but the survival of ETT drops down considerably. Vire et al (1991) have reported the common cause of extraction of ETT as, 60% unrestorable crown fracture; 32% periodontal problems and only 7% endodontic failures. A landmark study by Ray and Thorpe analyzed the probable causes for failure of ETT, they concluded that 91.4% success rate is possible with good endodontic treatment followed by good post endodontic restoration (PER) and it plummets to 18.1% with poor endodontic therapy and poor PER. Interestingly the success rate climbs up to 62.6% in cases with poor endodontic therapy but a good PER. Thus, survival of the tooth, which is the ultimate aim of the clinician, is largely dependent on a good endodontic therapy followed by a dependable PER.

PARADIGM SHIFT

The earlier literature had consistently concluded that endodontic therapy has deleterious effects on the biomechanical properties of the tooth making them susceptible to fracture. Full coverage crowns were advocated to sustain the survival of these teeth. Papa et al and Segdely, Messer et al. refuted this claim and reported no significant difference in moisture content, fracture resistance, shear strength and hardness of ETT. Controversies exist on deleterious effect of endodontic access preparations on the structural integrity of tooth due to enhanced cuspal deflection However Reech et al (1989) demonstrated that the strength of natural tooth before and after endodontic access preparation remains within acceptable limit when compared with involvement of marginal ridge for MO/DO/MOD. With the evolving evidence that the tooth structure and properties remain essentially similar after endodontic therapy there is a paradigm shift in how these teeth are restored.

ADVENT OF ADHESIVE POST ENDODONTIC RESTORATION (PER)

The availability of proven and reliable adhesive materials and techniques have been a game changer in contemporary restorative practice. The biomimetic perspective aims at preservation and conservation of remaining tooth structure and striking a balance between the biological, mechanical, adhesive and esthetic parameter to enhance the survival of these teeth. The concept of adhesive Post Endodontic restoration aims at minimizing the 'Restorative Cycle of Death' of the tooth which was described by Elderton et al and Simonsen (1991).

It elaborates how repeated restorative interventions for defective restorations ultimately results in mutilation of tooth structure warranting its extraction.

3 DIMENSIONS OF PER

A PER has three different functions

1-To provide hermetic seal apically as well as coronally,

2-To provide protection to the remaining tooth structure and

3-To restore the form and function of the tooth.

Till recently one single PER was designated to perform all the functions and provide longevity. However, it is accepted that no material or technique is full proof and many fail without warning. So, a layered restorative technique seems to be the only way forward to face these challenges. It is imperative then that a holistic treatment protocol is developed which addresses the functional requisites in a methodical way. The PER thus have three units which are to be meticulously executed for success and survival of ETT

1- Intracoronal/ Intraorifice restorations

2-Foundation restorations/ Core Build up

3-Extracoronal restorations- Direct /Indirect

<u>1-Intracoronal/ Intraorifice restorations</u>

The oral environment exposes the restorations to various microorganisms. Studies by Swanso (1987) Alves (1998) proved that exposure of well condensed coronal gutta-percha to oral fluids resulted in migration of bacteria to the apex within few days; bacterial toxins penetrate even faster leading to failure. Since for endodontic success 'seal is the deal; and 'everything

eventually leaks' the obturating material needs to be secured with additional intra-coronal restoration or intra-orifice sealer. This was first described by Roghanizad and Jones (1996) to prevent contamination of root canal system during temporization. Studies by Pisario et al (1998), Wolcott et al (1999), Yamauchi (2005), Hegde et al (2014) have consistently demonstrated the efficacy of intra-coronal barriers in preventing coronal microleakage. GIC, RMGIC, Flowable composites, MTA and Bio-ceramic cements have been used as intra-coronal barriers and reportedly prevent coronal leakage. The bio-mimetic material like MTA, in addition to preventing leakage; helps to replace lost dentin and create a monoblock unit; thereby helping stress distribution and enhancing fracture resistance. Despite extensive research supporting placement of intra-coronal barriers a universally accepted protocol that incorporates this crucial step is nonexistent.

2-Foundation Restorations/ Core build ups

A core is properly shaped and well-designed substructure, which replaces missing coronal tooth structure and retains the final restoration. The two types of core are, Space-filling core, which simply fills out the pulp chamber and Structural Core, which replaces substantial part of the clinical crown and forms a foundation for the final restoration; sometimes post placement is done for enhanced retention. Conventional GIC and RMGIC core build ups provide ease of placement and adhesion but lack adequate strength. Composite resins-based core has adequate compressive strength, are adhesive and have simplified the clinical procedures. Bulk filled, Silorane based composites cores significantly raise the fracture resistance and reduce cuspal deflections of ETT. Newer Core-build up materials contain monomers with a photoactive group in urethane-based methacrylate resin (SureFil SDR) that slows the polymerization rate there by preventing polymerization shrinkage and thus adversely affecting the dentin bonding. Reinforcement with silanized glass fibers or polymer impregnated fibers reportedly increase flexural strength of the composites. Burrow et al have reported degradation of dentin-adhesive bond almost to a level of unbonded restoration within 3 years when exposed to moisture. However, there is limited data available on this.

If 2mm circumferential ferrule and 2.5 of biological width is not available the foundation restoration is supported by placing a post. There are few subjects in dentistry more studied than the use of posts, yet controversies remain. The scientific evidence available today points towards promising performance of bonded nonmetal posts. The nonmetal posts are esthetic, known to strengthen the root dentin and are esthetic. However, less dentinal tubule density, altered collagen, repeated thermal, chemical and mechanical stresses makes their adhesion with radicular dentin unpredictable and compromised. The most commonly reported failure/complications with these posts are loosening and root fracture (0% to 11.4% after 2 years).

EXTRACORONAL RESTORATIONS

The clinical longevity of the of ETT is entirely dependent on the selection of the final PER. Earlier full coverage crowns were mandated to enhance the survival of all ETT. However, minimally invasive endodontics makes it possible to preserve tooth structure and prevent full coverage restorations. The rationale for extracoronal bonded resin restoration is based on three factors 1-Soffit and remaining peri-cervical dentin, 2- Bio-dome plus Bio-Rim and 3-Ferrule.

Soffit & Peri-cervical dentin- (Clark & Khademi) our aim should be to preserve maximum tooth structure at the cervical area, without compromising on debridement or introducing iatrogenic misadventure. Soffit provides a brazing effect and structurally reinforces the tooth.

Bio-dome and Bio-Rim

In natural teeth, enamel acts like a dome for underlying dentin, similar to the dome of temple, cathedral, mosque or stupa. This compression dome transforms and transfers loads, via the dentino-enamel complex (DEC), into dentin as primarily compressive load. Disruption of Biodome (by cutting the wrong areas) significantly shifts the load pathways of the tooth and these excessive unnatural tensile forces lead to crack propagation along flexural plane and eventual fracture and/or loss of tooth structure. Preservation of remaining Bio-rim, oblique, transverse or marginal ridges and the adhesive restorative concepts replicates the biodome. The Bio-Rim, an area just below the maximum point of convexity of the tooth; is likened to the

walls supporting the dome. Research has indicated that preservation of Bio-Rim and high-end bonding systems are close to replicating the strength of natural enamel-dentin bond.

Ferrule

The presence of adequate circuitous tooth structure or ferrule at crown root interface provides bracing and casing action which protects integrity of the root. Stankiewicz and Wilson published a review on teeth restored with 1mm ferrule vis-a-vis no ferrule. They concluded that minimum 1.5 to 2mm ferrule is indicated for beneficial resistance to fracture. Surgical crown lengthening or orthodontic extrusion should be considered in order to establish ferrule in mutilated ETT. In cases where ferrule cannot be established, extraction of the tooth should be advocated.

ADHESIVE RESTORATIONS FOR ETT

Peroze et al (2005) have proposed a classification of restorative plan based on remaining tooth structure- class I all four walls remaining; Class II- 3 walls; class III -2 walls class IV- 1 wall and Class V -no wall.

Direct composites are material of choice for class I endodontic cavities in low stress bearing areas. In a statement issued by American Dental Association, direct composites are avoided in large lesions, stress bearing areas and where cuspal coverage is mandated.

Indirect restorations like inlays, onlays (cover 1-2 cusps), overlays (cover all cusps) V- onlays (overlay with involvement of buccal surface), Endocrown (form of overlay extending to pulp space to provide mechanical retention and stability) are selected based on quality and quantity of remaining tooth structure. The modern adhesive ceramic restorations preserve and strengthen the remaining tooth structure. This synergistic bond between ceramic and dental tissue mediated by the resin-based cement virtually replaces the lost natural biodome of the nonvital tooth. This technological breakthrough is helping clinician to restore most of the mutilated nonvital teeth.

SUMMARY

"More endodontically treated teeth are lost due to poor restoration than subsequent endodontic failure."

– Franklin Weine

The survival of ETT is the measure of true success of endodontic therapy. Many new materials are available for restoration of pulpless teeth; however, their prognosis lies primarily on the application of sound biomechanical principles rather than on materials used for restorations. The dogma that a devitalized tooth is equivalent to crowned tooth is gradually changing as minimally invasive adhesive restorations mechanically stabilize tooth-restoration complex and allow conservative, faster and less expensive treatment options. However, more long-term clinical trials are needed to evaluate effectiveness of these treatments. The structural integrity of the tooth, its location in dental arch, parafunctional occlusal contacts, esthetics, endodontic/periodontic prognosis and financial implications should be thoroughly evaluated before placing a definitive adhesive PER. Research indicates that a meticulously executed 3D PER (Intracoronal restoration, Core Build Up and extracoronal restoration) is imperative for success and survival of ETT.

"Quality of final restoration co-determines success of endodontic treatment."
- Ray and Trope (1995).

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Beyond the borders of the pulp chamber

Dr. Shalu Krishan
B.D.S., M.D.S.
Co-Founder,
Chai Coffee and Dentistry Dental Academy

"Art is a form of meditation and the best way to de-stress"
Shalu Krishan

Dr. Shalu Krishan Gupta is an Endodontist and Restorative Dentist who along with her husband Dr. Vishal Gupta have a dental academy, Chai Coffee and Dentistry where they run Continuing Dental Education Courses pertaining to Restorative Dentistry.

Dr. Shalu Krishan is an alumnus of King Georges Medical College, Lucknow. For her, expression through arts has been a part of her whole life's fondness which had been rooted since childhood. Dabbling in all forms of art such as drawing, singing, and playing the guitar was

what comprised her educational experiences as well. In fact, she believes that her talented hand at restorative dentistry is an extension of her love for creativity.

Due to professional commitments, this passion took a backseat, however, she rekindled her creativity in the form of drawing mandalas and began treading the journey into the world of art again. In the ancient Sanskrit language of Hinduism and Buddhism, the word mandala means "circle." Traditionally, a mandala is a geometric design or pattern that represents the cosmos or deities.

In 2018, she shifted her medium to paper quilling- a paper art that involves making shapes into colourful and intricate designs. Most of her work is inspired by nature and she believes it helps her express herself the best. She believes that following one's passion enriches the soul and helps strike a balance between work and hobby. This is what helps her along the journey of paper and ink, despite being into clinical practice.

The various accolades she has received are a mere product of her love and persistence. She also runs *Facebook/Instagram page #papermantra* where you can see all her artworks which have mostly found their way into the homes of friends and loved ones.

Her recent quilling MOLAR MANDALA is on display at *Dr Chandarana Dental Museum* in Vadodara, Gujarat. She shares her work with like-minded artists and aficionados who admire the process as much as she does.

Amazing art by Dr. Shalu Krishan !!!

INDIAN ENDODONTIC SOCIETY

Being a woman

…….one birth!.. two lives!!

Squeaky voice as a little toddler
Clinging to her mom's shoulder
Born with innate inquisitiveness
Bonding and warming up to her girly togetherness
She seemed so unstoppable
Was all pervading and capable
Walls of her room still echo her chatters
That "extra portion" of that yummy food was always hers
Aimless running like lightning and endless giggles
Oh! Did I dream, they've gone like bubbles
The beautiful outer layers of me peeling away!
Trying hard to keep my tears at bay
I hate to look at that mirror
For its reflection isn't so dear
The inner child in me yearning to be unconditionally loved
Despite fading of those beautiful curves Don't give a wry look at my potbelly Perhaps it could be the bed of another baby Nappies, bibs so soggy & smelly all day Tending to her incessant cries made me grey
How did my routine of "Eat, play, sleep, repeat
Become "Feed, clean, feed, repeat"?
But her tender fingers caressed me for sure
As if she's trying to reaffirm and reassure
I realized my life's come a full circle
Afterall, I got a second chance to hear that giggle
Does it even matter it didn't come from my throat?
Because that voice would always win my vote
Cradle her in my arms and shoulder
Oh! Come on! It's no longer a bother
Freezing those moments for my eternity
Cherishing the time with my little celebrity
For God put my life on replay mode
I better master the act of putting my portions as "extra"
When my angel comes looking for, just in case
For my chatters didn't vanish like MH 370
I'm not to be blamed If you misread it article 370
For I'm a woman and celebrating my second innings!

Dr. V. Susila Anand
M.D.S., PhD.

Being a woman

एक एहसास

भीनी - भीनी खुशबु लिए
मुलायम रेशमी एक पल्लू
एहसास है, वजूद है .....
संस्कारों का धागा – धागा लपेटे वह
हर वक्त मौजूद है।

अनजान बादलों में , अंधेरे रास्तों पर
थामने आ जाता कोई हाथ है
वह हरारत स्पर्श ,
एहसास दिलाता है .....
मेरी हमसफ़र हरदम साथ है।

कभी यूँ ही अकेलेपन में
खाली - खाली सीने पर
आकर लिपट जाती है उसकी
छोटी - छोटी उंगलियाँ
अकेलापन सिमट लेती है
एहसास दिलाती है ...

आशा है वह ,उम्मीद का सवेरा है
मिटटी से उसका गहरा नाता है।

कैसे हर राह पर डटकर खड़ी है
हर हाल से लड़ रही वह फुलझड़ी है
जिंदगी का पैया है ,
साथ निभाती सवारी है
सम्मान , अभिमान हमारा .....
यह भारत की नारी है।

Dr. Sarvesha Mahajan
M.D.S.

What next?

The 32nd National Conference of the Indian Endodontic Society is being held at Chennai Trade Centre, Chennai, Tamil Nadu, India from 3rd to 5th October 2024. Distinguished speakers worldwide will be delivering scientific lectures and interacting with the delegates. The conference focuses on refining our academic knowledge and improving technical skills, on a larger platform. For more details visit www.iescon2024.com

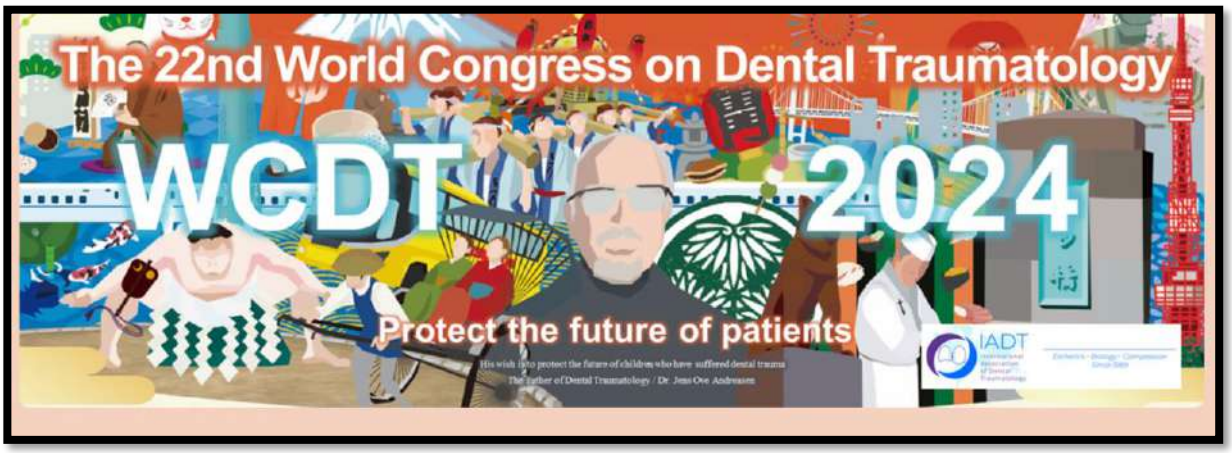
4-6 APRIL 2024 RADISSON BLU CAVELOSSIM, GOA, INDIA

The conference will have themed symposia covering 3D diagnosis, trauma classification and indices, management protocols for crown fractures, luxation injuries, avulsion, and combination trauma, autotransplantation, implant-based rehabilitation, orthodontic management, external cervical resorption, external root resorption, and many more.

The biennial World Congress of the International Federation of Endodontic Associations (IFEA) will be organized in 2024 by The British Endodontic Society (BES) with Glasgow, Scotland, as the host city from the 11th– 14th September 2024.

The 8th Trans-Tasman Endodontic Conference (TTEC) is to be held on 30 May – 1 June 2024 at "The Star Event Centre", Gold Coast, Australia. TTEC is held biennially and is the largest endodontic conference in Australia and New Zealand. The event is jointly organized by the Australian Society of Endodontology (ASE) and the New Zealand Society of Endodontics (NZSE).

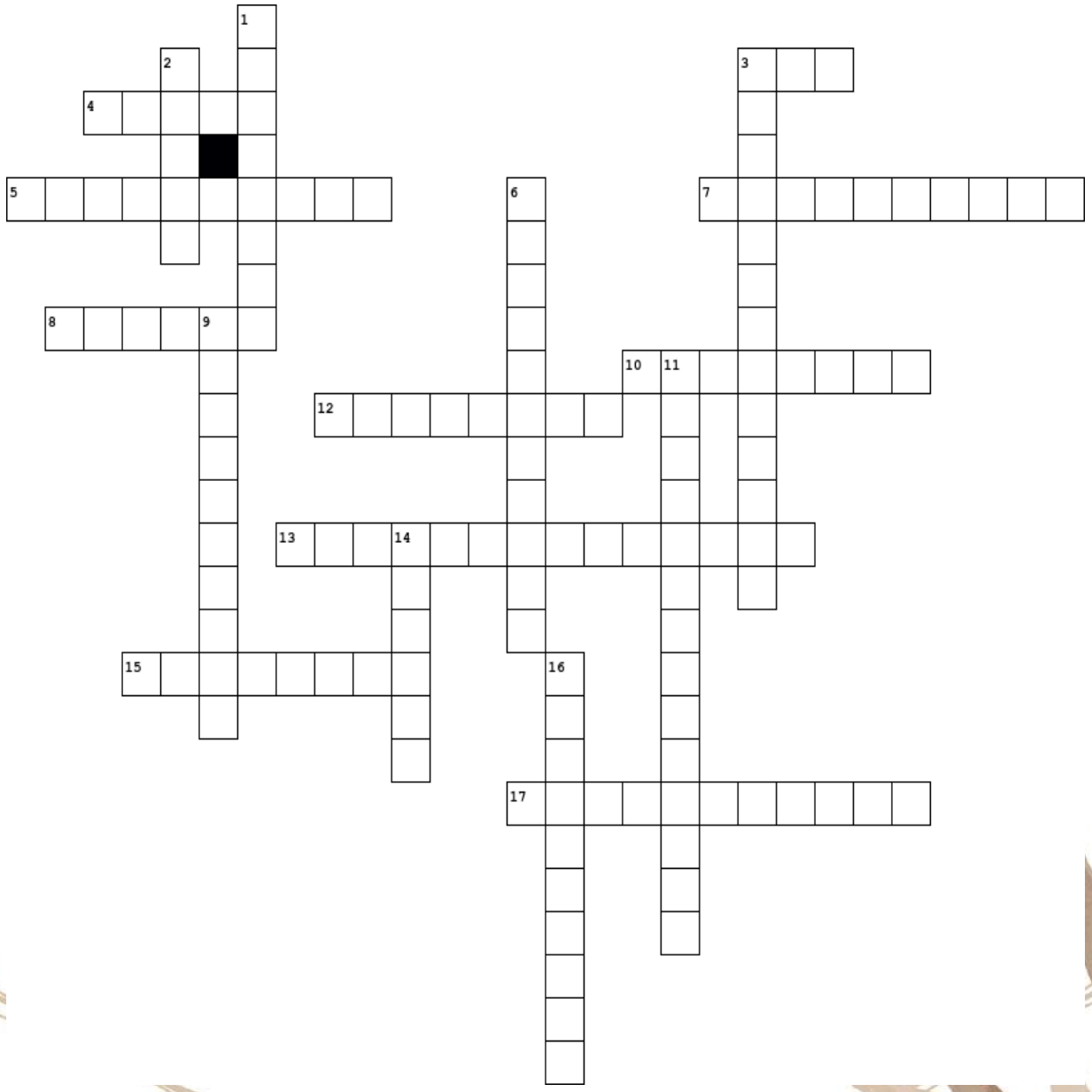
TTEC Conferences are well-known as exceptional meetings that combine the clinical science and practice of Endodontics with the underpinning biological and materials sciences organized.



The 22nd Congress on Dental Traumatology is being held in Tokyo on July 12-14th.For more details log onto-https://www.iadt-dentaltrauma.org/meetings.html

INDIAN ENDODONTIC SOCIETY

ENDO MIND BENDER



Across	Down
3. Ionizing radiation-free imaging modality	**1.** 6th generation of apex locators
4. UV light-crosslinked gelatin meth-acryloyl hydrogel	**2.** Narrowest portion of a zipped canal
5. According to Rickert & Dixon, the concept of obturation is based on this theory	**3.** Removal of surface defects with a 12- or 16-fluted composite finishing bur
7. First zone of Fish	**6.** Predominant species causing root caries
8. K files are traditionally made from a _____ blank	**9.** Taper that decreases from the tip to the handle
10. Stages 4 to 5 of this classification are optimal stages of tooth development for autotransplantation of molars	**11.** Lesion which begins centrally within the tooth and gives a pinkish hue to the crown
12. Leubke recommended extension of only that portion of the wall where extra canal exists	**14.** Modified the Gates Glidden drills to create a circumferential "staging" platform
13. Complete displacement of a tooth from the socket	**16.** Biological aging causing gradual deterioration
15. The "A" in A-PRF stands for?	
17. Dentin formed due to the stimulation of resident quiescent odontoblasts	

Answer Key

Across

3.MRI, 4.GelMA, 5.Hollow Tube, 7.Infection, 8. Square, 10.Morrees, 11.Shamrock, 13.Avulsion, 15. Advanced, 17. Reactionary

Down

1.Adaptive, 2. Elbow, 3. Macroabrasion, 6. Actinomyces, 9. Regressive, 11.Odontoclastoma, 14. Ruddle, 16. Senescence

The Debutante

Bio- C Repair (Angelus)

There are numerous bioceramic materials available which have pertinent uses in endodontic procedures. But there are very few which are 'ready to use'. One such material is Bio C Repair from Angelus company which has varied applications like treatment of root canal perforations or furcation; sealing of internal and communicating root resorptions; retrofilling in endodontic surgeries; vital pulp therapy, apexification and apexogenesis. It is available as a premixed putty which has ease in usage. It has an alkaline pH (12), a high release of calcium ions, is hydrophilic and displays chemical adhesion to dentin. It does not cause staining and hence can be safely placed in the coronal area of teeth. The material sets in approximately 120 minutes. In a study by Abrão et al the cytotoxicity and genotoxicity of Bio-C Repair, Endosequence BC Root Repair, MTA Angelus and MTA Repair HP was evaluated and found that Bio-C Repair is non-cytotoxic to osteoblastic cells, but showed greater genotoxicity than others tested biomaterials.

https://angelus.ind.br/produto/bio-c-repair
Abrão et al. Braz Dent J. 2023;34:14-20.

Elements Connect Cordless Endodontic Motor and Apex Connect Apex Locator (Kerr)

Kerr has recently introduced two devices; the elements Connect cordless endodontic motor and the Apex Connect electronic apex locator. Elements Connect endodontic motor operates in standard rotary, reciprocation and adaptive motions, allowing clinicians to use their preferred motion during root canal treatment. The motor comes with 14 memory slots, with nine that are pre-set file settings and five that are customizable. The motor can be coupled with Apex Connect for real-time working length readings during instrumentation of the root canal. Apex Connect has built-in automatic self-calibration to assure measurement accuracy for enhanced precision during shaping procedures. A good feature about these devices is that they can be used in tandem or as standalone.

https:// store.kerrdental.com

Endo- Aspirator (Cerkamed)

Drying of root canals has been made easier with the introduction of Endo- Aspirator from Cerkamed company. This disposable device with an ultrathin tip of 0.29 mm is used for removing the irrigant, thus reducing the required number of paper points (upto 80 %). Hence, this will aid in reducing the working time. The ultrathin tip makes it possible to be used even in fine canals. The Endo- Aspirator is connected to the suction device (aspirating nozzle) using a coupler, and then placed in the root canal.

https://cerkamed.com/product/endo-aspirator/

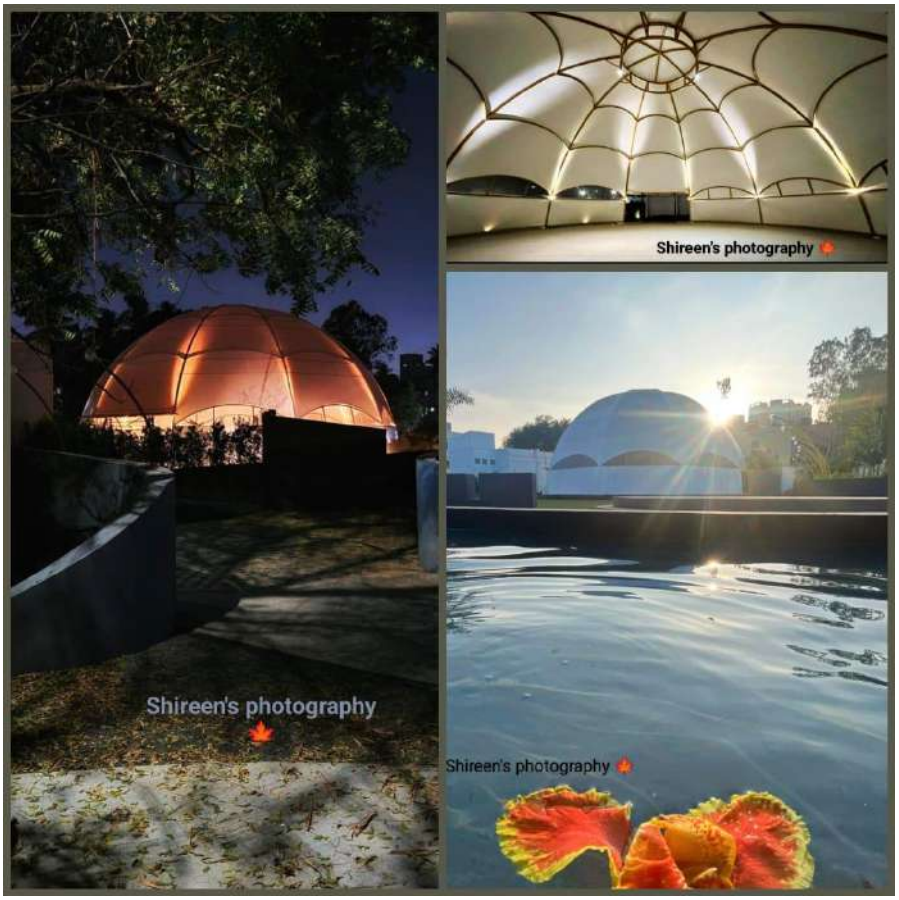
INDIAN ENDODONTIC SOCIETY

Post graduate's Creativity

Dr. Anshika Saxena
PG second-year student
Subharti Dental College and Hospital

IES TIMES
Official Newsletter of Indian Endodontic Society

Lights and shadows are the opposite sides of the same coin.
We can illuminate our path or darken our way.
It's a matter of our choice
Yet the DARKNESS, let the STARS shine brighter ♥



Dr. Shireen J
PG first-year student
Sri Venkateshwara Dental College and Hospital

वजूद तेरा जो मिटाने चला कोई,
वो खाक में मिल जाएगा।
शोला है तू आग है वो,
जो उन सब को राख कर जाएगा।

जो चाही है मंजिल तूने,
उस तक लड़कर ही जा पाएगा।
मुसीबत लाख आए पथ पर,
उन सबको मात दे जाएगा।

ऐसा भी नहीं कि,
हर घड़ी तू सफलता ही पाएगा।
जीता है वही,
जब हार कर भी हौसला रख पायेगा।

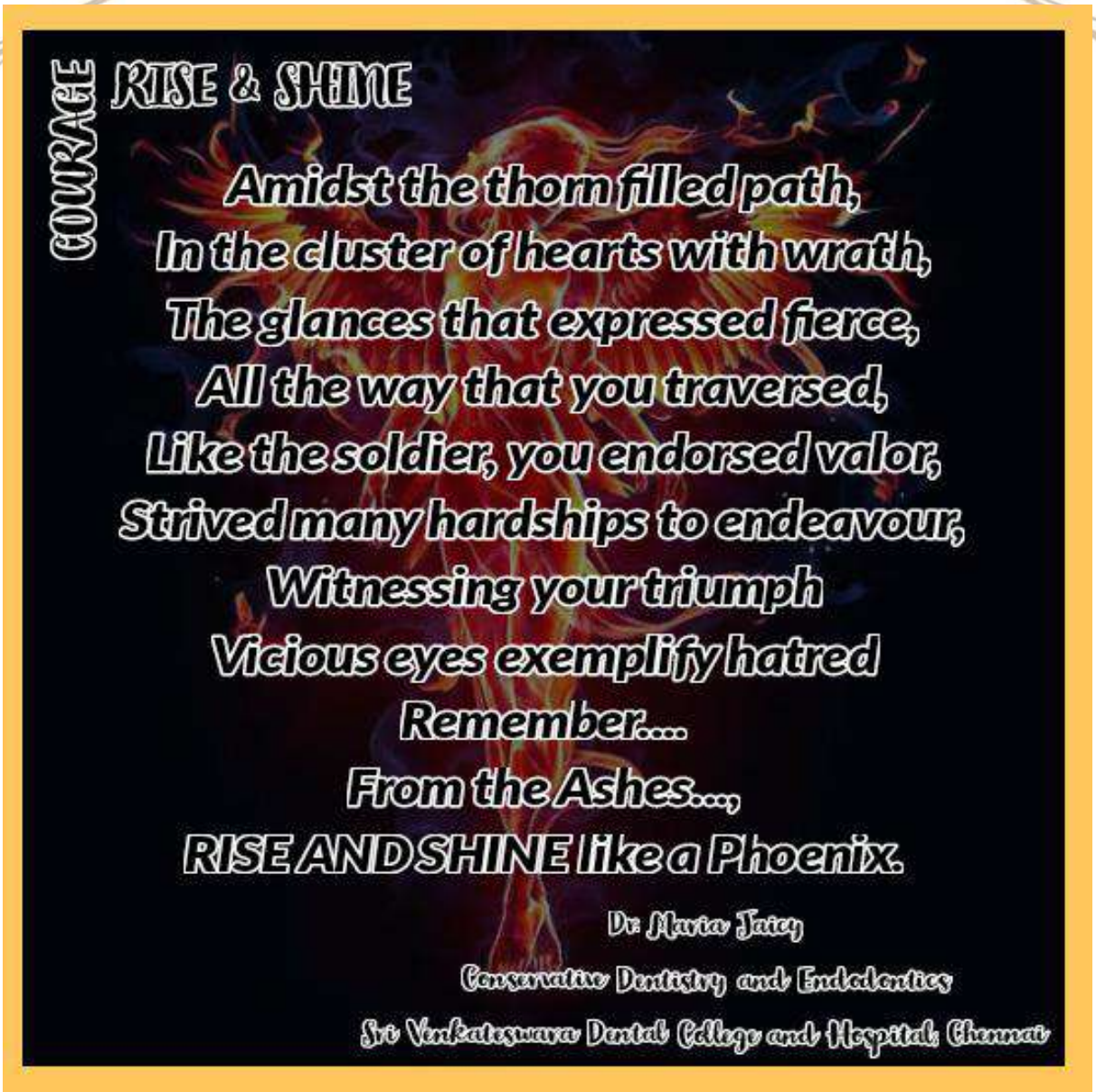
हारकर जो टूटे तू कभी,
तो जग को खुद से दूर पाएगा।
पर याद रख टूटकर जो फिर जुड़ा,
तो तुझसे बेहतर कौन कहलायेगा।

संग हो या ना हो कोई साथी,
वादा कर अकेले चलता चला जाएगा।

रुकेगा ना कहीं किसी पहर,
बस लड़ता चला जाएगा।

मत सोच अकेला है तू,
मंज़िल तक ना पहुंच पाएगा।
जब खुद खुदा है तेरे साथ,
तो तू अकेला कहां कहलायेगा।

Dr. Garima Verma
PG first-year student
Subharti Dental College and Hospital



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INDIAN ENDODONTIC SOCIETY

EDITORIAL TEAM

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- H.E. Luccock

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