

Endodontics: Current Trends, New Horizons...

M Omer Gorduysus^{1,2*} and Sheela Balu Abraham¹

¹Department of General and Specialist Dental Practice, University of Sharjah, United Arab Emirates

²Department of Endodontics, Hacettepe University, Turkey

***Corresponding Author:** M Omer Gorduysus, Department of General and Specialist Dental Practice, University of Sharjah, United Arab Emirates, Department of Endodontics, Hacettepe University, Turkey.

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The utilization of new technological advances and materials in clinical endodontics is heading on a new era "ahead of the curve". The outline of endodontic practice and clinical concepts are changing rapidly. The use of calcium hydroxide as an intra-canal by almost 80% of the general practitioners and endodontists for necrotic pulps and even for the routine dressings has replaced the old classics and increased the success rate with the introduction of efficient rotary engines, systems and various rotary tips, manual preparation has become less used and is the preferred technique in the endodontic offices. Routine use rubber-dam use in the world and saliva isolation techniques has contributed to aseptic conditions very much. Newer anesthetic techniques like Gow-Gates, Akinosi, intra pulpal techniques and devices the pain management in endodontics has improved. Electronic apex locators, introduction of mineral trioxide aggregate (MTA), IRM, the use of very sophisticated adhesives for restorations and glass-ionomers for coronal sealing based on the studies show the importance of the preventing coronal leakage following the root canal treatments for success, new condensation and compaction techniques has decreased the endodontic failures.

Besides the classical burs, newly designed endodontic burs, operation microscope and magnification loupes, micro endodontic instruments, new micro-surgical and retro-preparation techniques in endodontic surgery, improvements in re-treatment methodologies and applications, lasers and ultrasonics have revolutionized endodontics. Also new retrograde filling materials and root canal sealers with less leaking and adhesive properties old challenges overcame and contributed to long term success. Probably one of the most important developments in endodontics is related with endodontic radiology and diagnostics. The advent of CBCT imaging, digital volume tomography in endodontic practice and diagnosis, 3D imaging techniques and dental micro-ct make endodontics a technology dominated area in dentistry and changed the old concepts. Use of cone beam CT to identify the anatomy of the canals and related anatomic issues before treatment contributed great impact for the treatments; Application of new biomaterials gave new opportunities to endodontists and interest to endodontics increased among the general practitioners and also the patient expectations from endodontic treatments. Ultra-flexible NiTi rotaries, use of chlorhexidine and EDTA also efficient use of sodium hypochloride, filling the canals with resin based and/or epoxy resins improved the quality of the clinical jobs. Negative pressure irrigation techniques and irrigation apparatus helped to remove much pathogenic bacteria from the infected canals. Even post endodontic restorations, new techniques and concepts along with newer post materials and systems like fiber posts gave great confidence for post endodontic dental rehabilitations. Since 90's, in last two or three decades endodontics has improved rapidly and that unbelievable big steps mandated the policy makers and educators in endodontics to change and improve the curriculums in endodontics either in undergraduate or graduate levels.

Demand for the graduate endodontic and specialty programmes increased very much. Literature enriched and new endodontic journals and reference books introduced for the readers and researchers and the number of endodontic meetings increased all around the world made people intensify their attention towards endodontics more than ever, increased all around the world made people intensify their attention towards endodontics more than ever, almost in every country and region endodontic associations established and their relations with each other dynamised the interaction amongst the researchers and technology leaders of the field. All those gave the endodontists the opportunity to involving evidence based endodontics and research for best treatment options based on scientific data. The researchers in the field of endodontics involved more sophisticated studies and projects. Endodontics has no more remained a blind science. We are seeing more and better before than era before.

Quo vadis? It means “where do you go” in Latin. Now time for us to ask ourselves as endodontic educators, researchers and policy makers “where do we go”, “what can we expect in future” and “what would be the future trends in our field”. Are we at the limit of technology led endodontics? Perhaps not...Still improvements will continue. But on the other hand maybe we should expect more advanced steps related to basic sciences in endodontics after we started to talk about regenerative endodontics, stem cells from pulpal tissue, bioengineering. Awareness of the patients related stem cells and as long as regenerative medicine is in the agenda the expectations are changing. Stem cell therapies are able to regenerate the pulp after removing the infected pulp. Various tissues in different stages of development already have been used in clinics; at least these attempts are promising. We are still in the stage of discovery but from now on it is very clear the future trends will be related to regenerative and reparative endodontics.

Another crucial point to be noticed is the changing demography of the world population. We can define the population of the 21st century as “aging society”. Human life is getting longer also the life quality as well. During the 50’s average human life was around 50-55 years or less but the life expectancy is increasing rapidly and seem we gained extra 25 years nowadays. In developed countries, the average human life is over 80 years and the trend is towards to centenarian generations. If the goal is improving the quality of life by reducing the edentulousness that means we need more endodontic therapy in the elderly people. Life expectancy and the percentage of older population are increasing and geriatric endodontics is gaining more significant role in complete dental care. This means more calcified and challenging canals and requires a special training related geriatric endodontics. I hope the importance of geriatric endodontics as a sub-division of endodontics will increase more and maybe the design of special programs will be a necessity for the geriatric needs in endodontics.

Every year the number of root canal therapies performed is increasing more than previous years in every region and country. The survival rate of teeth is increasing but still we need more graduate and specialty programs in endodontics. Here the question is “what should be the standard of the quality and the curriculum in endodontics” in future. Do we need more board exams in every region or country (even in some of them from region to region, town to town) or more realistic universal board systems around a global consensus. Perhaps time and effort consuming national and/or regional boards not very helpful and contributory for increasing the quality in endodontics and the global standards. These systems must be investigated and questioned under the frame of “evidence based” scientific proofs. Perhaps more education, global standardization in endodontic education and curriculum instead of national and regional outlined boards will remove some limits to allow free interactions among the endodontists, researchers and academics and will also give the patients the opportunity, freedom and privilege of taking treatments without boundaries which may permit the transfer of the cases internationally without local restrictions. Endodontics is an integral part of dental team and has very special place but besides that as a future trend endodontics will have more and stronger ties with some medical branches i.e. genetics, stem cell and cancer cure related fields because of the human pulp’s great potential as a resource for stem cells.

Conclusion

In conclusion we can state that new endodontic technology, materials and techniques will incorporate tissue engineering and regenerative techniques while technology leading armamentarium, equipment and tools which will continue to be introduced into clinical practice and will be used by better trained global (universal) endodontists more efficiently even in the centenarian generations successfully and besides that more collaborative researchers with the medical fraternity to better understand the disease process and its prevention management.

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