Nickel-Titanium (NiTi) endodontic files have brought a big step toward “efficient” practice of endodontic procedure. The rotary files help clinicians to reduce their working time and also increase the clinical success rate with minimal procedural errors by stainless steel instruments. Now the rotary NiTi instruments are the “essential” equipment for the root canal preparation.

However, the NiTi instruments sometimes separate inside root canals during shaping procedures. Clinicians need to understand why the instruments would be broken and how to reduce the fracture risk. Numerous brands of instruments are now in the market and they have different shapes and alloy characteristics. The geometries of the instruments may give some information related to the stress generation and fracture tendencies. And the stresses may relate to the root dentin fracture. Therefore clinicians need to understand the geometries that may implicate the mechanical characteristics of each instrument system.

This lecture will give an insight, based on research evidences, of the endodontic instruments for their potential risk of fracture as well as their effects on root dentin integrity.

Contents:

- Effects from geometry change
- Relation between cyclic fatigue and torsional resistances
- Cyclic fatigue vs. torsional stress: which one is more critic?
- **Torsional strength**
- **Effect from Pitch**
- **Geometric effects on Root dentin integrity**
CURRICULUM VITAE

Dr. Hyeon-Cheol Kim. DDS, MS, PhD
Professor, Chairman
Department of Conservative Dentistry
Pusan National University School of Dentistry & Pusan National University Dental Hospital
Address: Geumo-ro 20, Mulgeum, Yangsan, Gyeongnam, 626-787, Yangsan, Korea

ACADEMIC ACHIEVEMENTS
DDS from Pusan National University School of Dentistry (1989-1995)
Master’s degree from Pusan National University School of Dentistry (1996-1998)
Intern and Resident at Pusan National University Hospital, Department of Conservative Dentistry (1995-1998)
PhD degree from Pusan National University, School of Dentistry (2001-2005)

PROFESSIONAL QUALIFICATIONS
Military Service as a Captain in Naval Hospital, Pohang and Busan (1998-2001)
Private Practice at Busan, Korea (2001-2004)
Visiting professor at University of Minnesota Bio-Engineering Laboratory, School of Dentistry, University of Minnesota, Minneapolis, MN, USA (2008)
Council, The Korea Food and Drug Administration (2011-2013)
Director, Department of Education and Research, Pusan National University Dental Hospital (2010.9-2014.8)
Director, Dental Research Institute, Pusan National University Dental Hospital (2013.2-2015.1)
Professor at Pusan National University School of Dentistry (2004-present)
Chairman, Department of Conservative Dentistry, Pusan National University School of Dentistry (2012-present)
ACTIVITIES IN ACADEMIC SOCIETY
Director, International Committee, Korean Academy of Conservative Dentistry (2011-2013)
Director, Academic Committee, Korean Academy of Endodontics (2009-2014)
Treasurer, Korean Academy of Endodontics (2014-present)
Director, Academic Committee, Korean Academy of Microscope Dentistry (2013-present)

■ Main Research Scope
NiTi endodontic instruments, Fracture resistance, Fatigue analysis, Endodontic materials, Clinical endodontics

■ Representative Articles (International Journal)


19. Ju-Kyong Jang, Ove A Peters, WooCheol Lee, Sung-Ae Son, Jeong-Kil Park, Hyeon-


42. Jung-Hong Ha, Gary SP Cheung, Antheunis Versluis, Chan-Joo Lee, Sang-Won Kwak,
