

Appendices

APPENDIX I

Raw Data

Table I Raw Data

Group	Specimen #	Failure Load(N)	Failure Mode	Group	Specimen #	Failure Load(N)	Failure Mode
B	6	1095.12	F	BR	24	982.07	F
B	29	821.80	F	BR	26	982.72	F
B	44	1751.42	U	BR	32	476.16	U
B	4	1694.73	F	BR	50	1161.69	U
B	39	1955.95	U	BR	7	1294.18	U
B	12	1077.36	F	BR	45	544.94	U
B	11	1366.05	F	BR	13	816.72	U
B	38	1088.01	U	BR	31	615.08	F
B	41	1463.07	F	BR	25	417.67	U
B	30	1747.03	F	BR	40	467.83	U
W	49	1709.76	U	WR	1	977.96	F
W	33	1381.54	U	WR	14	724.17	F
W	2	1130.29	F	WR	48	731.58	U
W	21	1075.96	F	WR	47	821.25	U
W	46	953.36	F	WR	34	922.66	U
W	3	2110.87	U	WR	15	1190.65	F
W	28	1135.66	U	WR	5	1151.19	U
W	35	933.61	F	WR	22	1527.46	U
W	27	974.94	F	WR	23	738.32	F
W	42	1181.57	F	WR	19	1102.65	U
R	8	974.64	U				
R	20	969.26	U				
R	16	819.64	F				
R	43	712.78	F				
R	9	678.18	F				
R	36	731.51	U				
R	37	601.25	F				
R	10	1627.10	U				
R	18	1518.22	U				
R	17	2212.85	U				

F = Favourable Failure; U = Unfavourable Failure

APPENDIX II

List of Material Used In The Study

Table II Material Used In The Study

Material	Manufacturer
Disinfectant	Chloramine T, BDH Laboratory Supplies, England
Diamond disc	Gliflax, Branden, Germany
Sodium hypochlorite	Clorox, Clorox (M) Industries Sdn. Bhd., Malaysia
Ethylenediaminetetraacetic acid (EDTA)	Smear Clear, SybronEndo, USA
Barbed broach	SybronEndo, USA
K-files	SybronEndo, USA
Paper point	SybronEndo, USA
Gutta percha	SybronEndo, USA
Lentulo spiral	SybronEndo, USA
Resin based sealer	AH 26, Dentsply DeTrey, Konstanz, Germany
Finger spreader	SybronEndo, USA
Temporary filling	Cavit, 3M ESPE, USA
Glass Fibre Post	FRC Prostec Plus, Ivoclar Vivadent, Liechtenstein
Gates Glidden bur	Dentsply Maillefer, Switzerland
Resin based cement	Multilink N, Ivoclar Vivadent, Liechtenstein
Etchant	Total Etch, Ivoclar Vivadent, Liechtenstein
Bonding agent	Multilink Primer A/B, Ivoclar Vivadent, Liechtenstein
Resin composite	Tetric N-Ceram, Ivoclar Vivadent, Liechtenstein
Plastic crown former	PD 171, Produits Dentaires, Switzerland
Petroleum oil	Vaseline, USA
Silicone impression material	Aquasil, Dentsply Caulk, USA
Dental alloy	System KN, Germany
Self cure epoxy resin	Mirapox 950, Miracon Sdn. Bhd., Malaysia

APPENDIX III

List of Equipment/ Instrument Used In The Study

Table III Equipment/ Instrument Used In The Study

Equipment / Instrument	Manufacturer
Ultrasonic scaler	Satelec, France
Gracey 5/6	Dentsply Ash, UK
Digital Caliper	Mitutoyo, Japan
Stereoscopic microscope	Kyowa Optical, Japan
Endodontic condenser	Dentsply Maillefer, Switzerland
Light cure unit	Spectrum 800, Dentsply Caulk, USA
High speed handpiece	GentleSilence, KaVo, Germany
Conventional speed handpiece	NSK, Japan
Dental surveyor	AF 30, Switzerland
Thermocycling machine	Faculty of Engineering, University of Malaya, Malaysia
Universal testing machine	Shimadzu, Japan

APPENDIX IV

Statistical Analysis Table

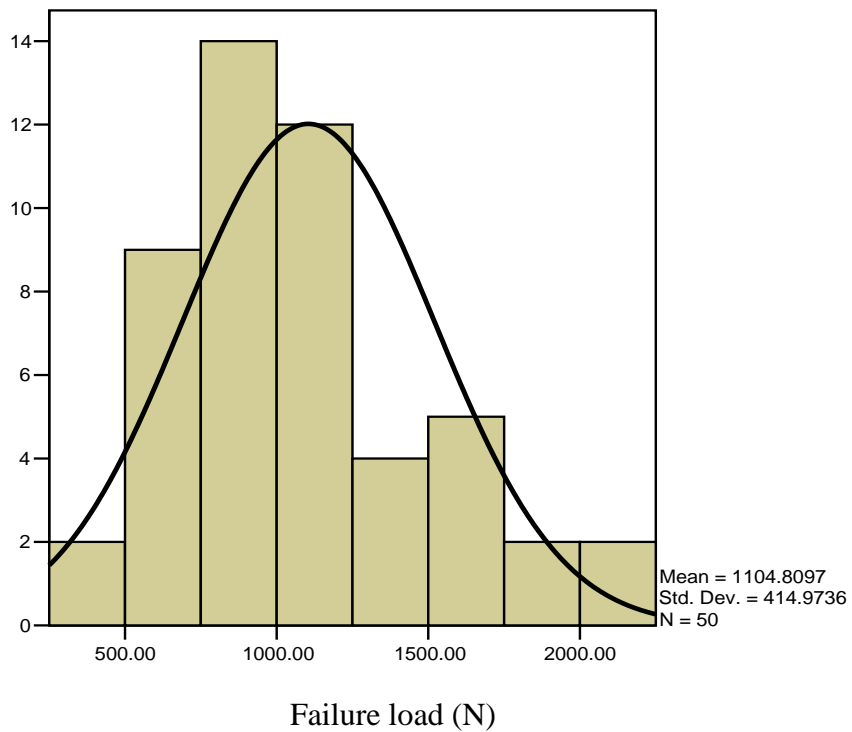
Table IV.1 The mean failure load, standard deviation and the 95% confidence interval

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
B	10	1406.0540	376.14083	118.94617	1136.9791	1675.1289	821.80	1955.95
W	10	1258.7560	379.34815	119.96042	987.3867	1530.1253	933.61	2110.87
R	10	1084.5430	528.37340	167.08634	706.5674	1462.5186	601.25	2212.85
BR	10	815.9060	298.30701	94.33296	602.5100	1029.3020	417.67	1294.18
WR	10	958.7893	199.86739	63.20362	815.8128	1101.7658	724.17	1227.46
Total	50	1104.8097	414.97360	58.68613	986.8755	1222.7439	417.67	2212.85

Table IV.2 Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2.168	4	45	0.088

Figure VI.1 Histogram of Failure Load of All Specimens



References

References

- Abramovitz, L., Lev, R., Fuss, Z. & Metzger, Z. 2001. The unpredictability of seal after post space preparation: a fluid transport study. *J Endod*, **27** (4), 292-5.
- Adanir, N. & Belli, S. 2008. Evaluation of different post lengths' effect on fracture resistance of a glass fiber post system. *Eur J Dent*, **2** (1), 23-8.
- Adorno, C. G., Yoshioka, T. & Suda, H. 2010. The effect of working length and root canal preparation technique on crack development in the apical root canal wall. *Int Endod J*, **43** (4), 321-7.
- Akkayan, B. 2004. An in vitro study evaluating the effect of ferrule length on fracture resistance of endodontically treated teeth restored with fiber-reinforced and zirconia dowel systems. *J Prosthet Dent*, **92** (2), 155-62.
- Akkayan, B. & Caniklioglu, B. 1998. Resistance to fracture of crowned teeth restored with different post systems. *Eur J Prosthodont Restor Dent*, **6** (1), 13-8.
- Akkayan, B. & Gulmez, T. 2002. Resistance to fracture of endodontically treated teeth restored with different post systems. *J Prosthet Dent*, **87** (4), 431-7.
- Al-Omiri, M. K. & Al-Wahadni, A. M. 2006. An ex vivo study of the effects of retained coronal dentine on the strength of teeth restored with composite core and different post and core systems. *Int Endod J*, **39** (11), 890-9.
- Al-Omiri, M. K., Mahmoud, A. A., Rayyan, M. R. & Abu-Hammad, O. 2010. Fracture resistance of teeth restored with post-retained restorations: an overview. *J Endod*, **36** (9), 1439-49.
- Al-Wahadni, A. M., Hamdan, S., Al-Omiri, M., Hammad, M. M. & Hatamleh, M. M. 2008. Fracture resistance of teeth restored with different post systems: in vitro study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, **106** (2), e77-83.
- Albashaireh, Z. S., Ghazal, M. & Kern, M. 2010. Effects of endodontic post surface treatment, dentin conditioning, and artificial aging on the retention of glass fiber-reinforced composite resin posts. *J Prosthet Dent*, **103** (1), 31-9.
- Alfredo, E., De Souza, E. S., Marchesan, M. A., Paulino, S. M., Gariba-Silva, R. & Sousa-Neto, M. D. 2006. Effect of eugenol-based endodontic cement on the adhesion of intraradicular posts. *Braz Dent J*, **17** (2), 130-3.
- Amaral, M., Favarin Santini, M., Wandscher, V., Villaca Zogheib, L. & Valandro, L. F. 2009. Effect of coronal macroretentions and diameter of a glass-FRC on fracture resistance of bovine teeth restored with fiber posts. *Minerva Stomatol*, **58** (3), 99-106.
- Anoorshiravani, D. & Nathanson, D. 1996. Efficacy of transilluminating posts for intraradicular composite curing. *J Dent Res*, **75**, 138.

- Askeland, D. R. P., Pradeep P. 2006. *The science and engineering of materials (5th ed.)*, Toronto: Cengage Learning (p.198).
- Asmussen, E., Peutzfeldt, A. & Sahafi, A. 2005. Finite element analysis of stresses in endodontically treated, dowel-restored teeth. *J Prosthet Dent*, **94 (4)**, 321-9.
- Assif, D., Bitenski, A., Pilo, R. & Oren, E. 1993. Effect of post design on resistance to fracture of endodontically treated teeth with complete crowns. *J Prosthet Dent*, **69 (1)**, 36-40.
- Ausiello, P., Apicella, A. & Davidson, C. L. 2002. Effect of adhesive layer properties on stress distribution in composite restorations--a 3D finite element analysis. *Dent Mater*, **18 (4)**, 295-303.
- Aydemir, H., Ceylan, G., Tasdemir, T., Kalyoncuoglu, E. & Isildak, I. 2009. Effect of immediate and delayed post space preparation on the apical seal of root canals obturated with different sealers and techniques. *J Appl Oral Sci*, **17 (6)**, 605-10.
- Baraban, D. J. 1967. The restoration of pulpless teeth. *Dent Clin North Am*, 633-53.
- Barkhordar, R. A., Radke, R. & Abbasi, J. 1989. Effect of metal collars on resistance of endodontically treated teeth to root fracture. *J Prosthet Dent*, **61 (6)**, 676-8.
- Bartlett, S. O. 1968. Construction of detached core crowns for pulpless teeth in only two sittings. *J Am Dent Assoc*, **77 (4)**, 843-5.
- Bergman, B., Lundquist, P., Sjogren, U. & Sundquist, G. 1989. Restorative and endodontic results after treatment with cast posts and cores. *J Prosthet Dent*, **61 (1)**, 10-5.
- Bitter, K. & Kielbassa, A. M. 2007. Post-endodontic restorations with adhesively luted fiber-reinforced composite post systems: a review. *Am J Dent*, **20 (6)**, 353-60.
- Bitter, K., Meyer-Lueckel, H., Priehn, K., Kanjuparambil, J. P., Neumann, K. & Kielbassa, A. M. 2006. Effects of luting agent and thermocycling on bond strengths to root canal dentine. *Int Endod J*, **39 (10)**, 809-18.
- Boschian Pest, L., Cavalli, G., Bertani, P. & Gagliani, M. 2002. Adhesive post-endodontic restorations with fiber posts: push-out tests and SEM observations. *Dent Mater*, **18 (8)**, 596-602.
- Bourauel, C., Freudenreich, D., Vollmer, D., Kobe, D., Drescher, D. & Jager, A. 1999. Simulation of orthodontic tooth movements. A comparison of numerical models. *J Orofac Orthop*, **60 (2)**, 136-51.
- Burns, D. A., Krause, W. R., Douglas, H. B. & Burns, D. R. 1990. Stress distribution surrounding endodontic posts. *J Prosthet Dent*, **64 (4)**, 412-8.

- Buttel, L., Krastl, G., Lorch, H., Naumann, M., Zitzmann, N. U. & Weiger, R. 2009. Influence of post fit and post length on fracture resistance. *Int Endod J*, **42** (1), 47-53.
- Cailleteau, J. G., Rieger, M. R. & Akin, J. E. 1992. A comparison of intracanal stresses in a post-restored tooth utilizing the finite element method. *J Endod*, **18** (11), 540-4.
- Camp, L. R. & Todd, M. J. 1983. The effect of dowel preparation on the apical seal of three common obturation techniques. *J Prosthet Dent*, **50** (5), 664-6.
- Caputo, A. A. & Hokama, S. N. 1987. Stress and retention properties of a new threaded endodontic post. *Quintessence Int*, **18** (6), 431-5.
- Caputo, A. A. & Standlee, J. P. 1976. Pins and posts--why, when and how. *Dent Clin North Am*, **20** (2), 299-311.
- Carson, K. R., Goodell, G. G. & Mcclanahan, S. B. 2005. Comparison of the antimicrobial activity of six irrigants on primary endodontic pathogens. *J Endod*, **31** (6), 471-3.
- Carter, J. M., Sorensen, S. E., Johnson, R. R., Teitelbaum, R. L. & Levine, M. S. 1983. Punch shear testing of extracted vital and endodontically treated teeth. *Journal of Biomechanics*, **16** (10), 841-848.
- Cathro, P. R., Chandler, N. P. & Hood, J. A. 1996. Impact resistance of crowned endodontically treated central incisors with internal composite cores. *Endod Dent Traumatol*, **12** (3), 124-8.
- Cecchin, D., Farina, A. P., Guerreiro, C. A. & Carlini-Junior, B. 2010. Fracture resistance of roots prosthetically restored with intra-radicular posts of different lengths. *J Oral Rehabil*, **37** (2), 116-22.
- Ceylan, I., Baydas, B. & Bolukbasi, B. 2002. Longitudinal cephalometric changes in incisor position, overjet, and overbite between 10 and 14 years of age. *Angle Orthod*, **72** (3), 246-50.
- Cheleux, N., Sharrock, P. & Degrange, M. 2007. Surface treatments on quartz fiber post: influence on adhesion and flexural properties. *Am J Dent*, **20** (6), 375-9.
- Cheung, G. S. & Chan, T. K. 2003. Long-term survival of primary root canal treatment carried out in a dental teaching hospital. *Int Endod J*, **36** (2), 117-28.
- Cheung, W. 2005. A review of the management of endodontically treated teeth. Post, core and the final restoration. *J Am Dent Assoc*, **136** (5), 611-9.
- Cooney, J. P., Caputo, A. A. & Trabert, K. C. 1986. Retention and stress distribution of tapered-end endodontic posts. *J Prosthet Dent*, **55** (5), 540-6.

Cormier, C., Souberbielle, J. C. & Kahan, A. 2001a. DHEA in bone and joint diseases. *Joint Bone Spine*, **68** (6), 588-94.

Cormier, C. J., Burns, D. R. & Moon, P. 2001b. In vitro comparison of the fracture resistance and failure mode of fiber, ceramic, and conventional post systems at various stages of restoration. *J Prosthodont*, **10** (1), 26-36.

Costa, L. C., Pegoraro, L. F. & Bonfante, G. 1997. Influence of different metal restorations bonded with resin on fracture resistance of endodontically treated maxillary premolars. *J Prosthet Dent*, **77** (4), 365-9.

Da Silva, L. A., Sanguino, A. C., Rocha, C. T., Leonardo, M. R. & Silva, R. A. 2008. Scanning electron microscopic preliminary study of the efficacy of SmearClear and EDTA for smear layer removal after root canal instrumentation in permanent teeth. *J Endod*, **34** (12), 1541-4.

Da Silva, N. R., Raposo, L. H., Versluis, A., Fernandes-Neto, A. J. & Soares, C. J. 2010. The effect of post, core, crown type, and ferrule presence on the biomechanical behavior of endodontically treated bovine anterior teeth. *J Prosthet Dent*, **104** (5), 306-17.

Dallari, A. & Rovatti, L. 1996. Six years of in vitro/in vivo experience with Composipost. *Compend Contin Educ Dent Suppl*, (20), S57-63.

Davy, D. T., Dilley, G. L. & Krejci, R. F. 1981. Determination of stress patterns in root-filled teeth incorporating various dowel designs. *J Dent Res*, **60** (7), 1301-10.

De Castro Albuquerque, R., Polleto, L. T., Fontana, R. H. & Cimini, C. A. 2003. Stress analysis of an upper central incisor restored with different posts. *J Oral Rehabil*, **30** (9), 936-43.

De Oliveira, J. A., Pereira, J. R., Lins Do Valle, A. & Zogheib, L. V. 2008. Fracture resistance of endodontically treated teeth with different heights of crown ferrule restored with prefabricated carbon fiber post and composite resin core by intermittent loading. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, **106** (5), e52-7.

Dean, J. P., Jeansonne, B. G. & Sarkar, N. 1998. In vitro evaluation of a carbon fiber post. *J Endod*, **24** (12), 807-10.

Desort, K. D. 1983. The prosthodontic use of endodontically treated teeth: theory and biomechanics of post preparation. *J Prosthet Dent*, **49** (2), 203-6.

Deutsch, A. S., Cavallari, J., Musikant, B. L., Silverstein, L., Lepley, J. & Petroni, G. 1985. Root fracture and the design of prefabricated posts. *J Prosthet Dent*, **53** (5), 637-40.

Dias, L. L., Giovani, A. R., Silva Sousa, Y. T., Vansan, L. P., Alfredo, E., Sousa-Neto, M. D. & Paulino, S. M. 2009. Effect of eugenol-based endodontic sealer on the adhesion of intraradicular posts cemented after different periods. *J Appl Oral Sci*, **17** (6), 579-83.

- Dietschi, D., Duc, O., Krejci, I. & Sadan, A. 2008. Biomechanical considerations for the restoration of endodontically treated teeth: a systematic review of the literature, Part II (Evaluation of fatigue behavior, interfaces, and in vivo studies). *Quintessence Int*, **39** (2), 117-29.
- Dietschi, D., Romelli, M. & Goretti, A. 1997. Adaptation of adhesive posts and cores to dentin after fatigue testing. *Int J Prosthodont*, **10** (6), 498-507.
- Dikbas, I., Tanalp, J., Ozel, E., Koksall, T. & Ersoy, M. 2007. Evaluation of the effect of different ferrule designs on the fracture resistance of endodontically treated maxillary central incisors incorporating fiber posts, composite cores and crown restorations. *J Contemp Dent Pract*, **8** (7), 62-9.
- Drummond, J. L. & Bapna, M. S. 2003. Static and cyclic loading of fiber-reinforced dental resin. *Dent Mater*, **19** (3), 226-31.
- Duret, B., Reynaud, M. & Duret, F. 1990. [New concept of coronoradicular reconstruction: the Composipost (1)]. *Chir Dent Fr*, **60** (540), 131-41 contd.
- Ellis, S. G., Mccord, J. F. & Burke, F. J. 1999. Predisposing and contributing factors for complete and incomplete tooth fractures. *Dent Update*, **26** (4), 150-2, 156-8.
- Felton, D. A., Webb, E. L., Kanoy, B. E. & Dugoni, J. 1991. Threaded endodontic dowels: effect of post design on incidence of root fracture. *J Prosthet Dent*, **65** (2), 179-87.
- Fernandes, A. S. & Dessai, G. S. 2001. Factors affecting the fracture resistance of post-core reconstructed teeth: a review. *Int J Prosthodont*, **14** (4), 355-63.
- Ferrari, M., Vichi, A. & Garcia-Godoy, F. 2000a. Clinical evaluation of fiber-reinforced epoxy resin posts and cast post and cores. *Am J Dent*, **13** (Spec No), 15B-18B.
- Ferrari, M., Vichi, A., Mannocci, F. & Mason, P. N. 2000b. Retrospective study of the clinical performance of fiber posts. *Am J Dent*, **13** (Spec No), 9B-13B.
- Fokkinga, W. A., Kreulen, C. M., Vallittu, P. K. & Creugers, N. H. 2004. A structured analysis of in vitro failure loads and failure modes of fiber, metal, and ceramic post-and-core systems. *Int J Prosthodont*, **17** (4), 476-82.
- Forberger, N. & Gohring, T. N. 2008. Influence of the type of post and core on in vitro marginal continuity, fracture resistance, and fracture mode of lithia disilicate-based all-ceramic crowns. *J Prosthet Dent*, **100** (4), 264-73.
- Foxton, R. M., Nakajima, M., Tagami, J. & Miura, H. 2003. Bonding of photo and dual-cure adhesives to root canal dentin. *Oper Dent*, **28** (5), 543-51.

Giachetti, L., Scaminaci Russo, D., Bertini, F. & Giuliani, V. 2004. Translucent fiber post cementation using a light-curing adhesive/composite system: SEM analysis and pull-out test. *J Dent*, **32** (8), 629-34.

Giovani, A. R., Vansan, L. P., De Sousa Neto, M. D. & Paulino, S. M. 2009. In vitro fracture resistance of glass-fiber and cast metal posts with different lengths. *J Prosthet Dent*, **101** (3), 183-8.

Gluskin, A. H., Radke, R. A., Frost, S. L. & Watanabe, L. G. 1995. The mandibular incisor: rethinking guidelines for post and core design. *J Endod*, **21** (1), 33-7.

Godder, B., Zhukovsky, L., Bivona, P. L. & Epelboym, D. 1994. Rehabilitation of thin-walled roots with light-activated composite resin: a case report. *Compendium*, **15** (1), 52, 54-7.

Goldberg, A. J. & Burstone, C. J. 1992. The use of continuous fiber reinforcement in dentistry. *Dent Mater*, **8** (3), 197-202.

Goldrich, N. 1970. Construction of posts for teeth with existing restorations. *J Prosthet Dent*, **23** (2), 173-6.

Grandini, S., Goracci, C., Monticelli, F., Tay, F. R. & Ferrari, M. 2005. Fatigue resistance and structural characteristics of fiber posts: three-point bending test and SEM evaluation. *Dent Mater*, **21** (2), 75-82.

Grecca, F. S., Rosa, A. R., Gomes, M. S., Parolo, C. F., Bemfica, J. R., Frasca, L. C. & Maltz, M. 2009. Effect of timing and method of post space preparation on sealing ability of remaining root filling material: in vitro microbiological study. *J Can Dent Assoc*, **75** (8), 583.

Grieznis, L., Apse, P. & Soboleva, U. 2006. The effect of 2 different diameter cast posts on tooth root fracture resistance in vitro. *Stomatologija*, **8** (1), 30-2.

Gu, X. H. & Kern, M. 2006. Fracture resistance of crowned incisors with different post systems and luting agents. *J Oral Rehabil*, **33** (12), 918-23.

Gutmann, J. L. 1992. The dentin-root complex: anatomic and biologic considerations in restoring endodontically treated teeth. *J Prosthet Dent*, **67** (4), 458-67.

Guzy, G. E. & Nicholls, J. I. 1979. In vitro comparison of intact endodontically treated teeth with and without endo-post reinforcement. *J Prosthet Dent*, **42** (1), 39-44.

Hagge, M. S., Wong, R. D. & Lindemuth, J. S. 2002. Retention strengths of five luting cements on prefabricated dowels after root canal obturation with a zinc oxide/eugenol sealer: 1. Dowel space preparation/cementation at one week after obturation. *J Prosthodont*, **11** (3), 168-75.

- Hajizadeh, H., Namazikhah, M. S., Moghaddas, M. J., Ghavamnasiri, M. & Majidinia, S. 2009. Effect of posts on the fracture resistance of load-cycled endodontically-treated premolars restored with direct composite resin. *J Contemp Dent Pract*, **10 (3)**, 10-7.
- Harrison, J. W., Wagner, G. W. & Henry, C. A. 1990. Comparison of the antimicrobial effectiveness of regular and fresh scent Clorox. *J Endod*, **16 (7)**, 328-30.
- Helfer, A. R., Melnick, S. & Schilder, H. 1972. Determination of the moisture content of vital and pulpless teeth. *Oral Surg Oral Med Oral Pathol*, **34 (4)**, 661-70.
- Hemmings, K. W., King, P. A. & Setchell, D. J. 1991. Resistance to torsional forces of various post and core designs. *J Prosthet Dent*, **66 (3)**, 325-9.
- Heydecke, G., Butz, F. & Strub, J. R. 2001. Fracture strength and survival rate of endodontically treated maxillary incisors with approximal cavities after restoration with different post and core systems: an in-vitro study. *J Dent*, **29 (6)**, 427-33.
- Hiltner, R. S., Kulild, J. C. & Weller, R. N. 1992. Effect of mechanical versus thermal removal of gutta-percha on the quality of the apical seal following post space preparation. *J Endod*, **18 (9)**, 451-4.
- Hong, J., Xia, W. W. & Xiong, H. G. 2003. [Analysis of the effect on the stress of root canal wall by vertical and lateral condensation procedures]. *Shanghai Kou Qiang Yi Xue*, **12 (5)**, 359-61.
- Ibrahim, H., El-Mowafy, O. & Brown, J. W. 2006. Radiopacity of nonmetallic root canal posts. *Int J Prosthodont*, **19 (1)**, 101-2.
- Innella, R., Autieri, G., Ceruti, P. & Gassino, G. 2005. Relation between length of fiber post and its mechanical retention. *Minerva Stomatol*, **54 (9)**, 481-8.
- Isidor, F., Brondum, K. & Ravnholt, G. 1999. The influence of post length and crown ferrule length on the resistance to cyclic loading of bovine teeth with prefabricated titanium posts. *Int J Prosthodont*, **12 (1)**, 78-82.
- Isidor, F., Odman, P. & Brondum, K. 1996. Intermittent loading of teeth restored using prefabricated carbon fiber posts. *Int J Prosthodont*, **9 (2)**, 131-6.
- Joseph, J. & Ramachandran, G. 1990. Fracture resistance of dowel channel preparations with various dentin thickness. *Fed Oper Dent*, **1 (1)**, 32-5.
- Jung, S. H., Min, K. S., Chang, H. S., Park, S. D., Kwon, S. N. & Bae, J. M. 2007. Microleakage and fracture patterns of teeth restored with different posts under dynamic loading. *J Prosthet Dent*, **98 (4)**, 270-6.
- Junge, T., Nicholls, J. I., Phillips, K. M. & Libman, W. J. 1998. Load fatigue of compromised teeth: a comparison of 3 luting cements. *Int J Prosthodont*, **11 (6)**, 558-64.

- Kane, J. J. & Burgess, J. O. 1991. Modification of the resistance form of amalgam coronal-radicular restorations. *J Prosthet Dent*, **65** (4), 470-4.
- King, P. A. & Setchell, D. J. 1990. An in vitro evaluation of a prototype CFRC prefabricated post developed for the restoration of pulpless teeth. *J Oral Rehabil*, **17** (6), 599-609.
- Kivanc, B. H. & Gorgul, G. 2008. Fracture resistance of teeth restored with different post systems using new-generation adhesives. *J Contemp Dent Pract*, **9** (7), 33-40.
- Lambjerg-Hansen, H. & Asmussen, E. 1997. Mechanical properties of endodontic posts. *J Oral Rehabil*, **24** (12), 882-7.
- Lassila, L. V., Tanner, J., Le Bell, A. M., Narva, K. & Vallittu, P. K. 2004. Flexural properties of fiber reinforced root canal posts. *Dent Mater*, **20** (1), 29-36.
- Leary, J. M., Aquilino, S. A. & Svare, C. W. 1987. An evaluation of post length within the elastic limits of dentin. *J Prosthet Dent*, **57** (3), 277-81.
- Libman, W. J. & Nicholls, J. I. 1995. Load fatigue of teeth restored with cast posts and cores and complete crowns. *Int J Prosthodont*, **8** (2), 155-61.
- Lima, A. F., Spazzin, A. O., Galafassi, D., Correr-Sobrinho, L. & Carlini-Junior, B. 2010. Influence of ferrule preparation with or without glass fiber post on fracture resistance of endodontically treated teeth. *J Appl Oral Sci*, **18** (4), 360-3.
- Lloyd, P. M. & Palik, J. F. 1993. The philosophies of dowel diameter preparation: a literature review. *J Prosthet Dent*, **69** (1), 32-6.
- Lu, H., Mehmood, A., Chow, A. & Powers, J. M. 2005. Influence of polymerization mode on flexural properties of esthetic resin luting agents. *J Prosthet Dent*, **94** (6), 549-54.
- Lui, J. L. 1994a. Composite resin reinforcement of flared canals using light-transmitting plastic posts. *Quintessence Int*, **25** (5), 313-9.
- Lui, J. L. 1994b. Depth of composite polymerization within simulated root canals using light-transmitting posts. *Oper Dent*, **19** (5), 165-8.
- Macedo, V. C., Faria E Silva, A. L. & Martins, L. R. 2010. Effect of cement type, relining procedure, and length of cementation on pull-out bond strength of fiber posts. *J Endod*, **36** (9), 1543-6.
- Mangold, J. T. & Kern, M. 2011. Influence of glass-fiber posts on the fracture resistance and failure pattern of endodontically treated premolars with varying substance loss: An in vitro study. *J Prosthet Dent*, **105** (6), 387-93.

- Mannocci, F., Ferrari, M. & Watson, T. F. 1999. Intermittent loading of teeth restored using quartz fiber, carbon-quartz fiber, and zirconium dioxide ceramic root canal posts. *J Adhes Dent*, **1** (2), 153-8.
- Marchi, G. M., Mitsui, F. H. & Cavalcanti, A. N. 2008. Effect of remaining dentine structure and thermal-mechanical aging on the fracture resistance of bovine roots with different post and core systems. *Int Endod J*, **41** (11), 969-76.
- Mareending, M., Luder, H. U., Brunner, T. J., Knecht, S., Stark, W. J. & Zehnder, M. 2007. Effect of sodium hypochlorite on human root dentine--mechanical, chemical and structural evaluation. *Int Endod J*, **40** (10), 786-93.
- Martinez-Insua, A., Da Silva, L., Rilo, B. & Santana, U. 1998. Comparison of the fracture resistances of pulpless teeth restored with a cast post and core or carbon-fiber post with a composite core. *J Prosthet Dent*, **80** (5), 527-32.
- Massa, F., Dias, C. & Blos, C. E. 2010. Resistance to fracture of mandibular premolars restored using post-and-core systems. *Quintessence Int*, **41** (1), 49-57.
- Mattison, G. D. 1982. Photoelastic stress analysis of cast-gold endodontic posts. *J Prosthet Dent*, **48** (4), 407-11.
- Mattison, G. D., Delivanis, P. D., Thacker, R. W., Jr. & Hassell, K. J. 1984. Effect of post preparation on the apical seal. *J Prosthet Dent*, **51** (6), 785-9.
- Mazzitelli, C., Monticelli, F., Toledano, M., Ferrari, M. & Osorio, R. 2011. Effect of thermal cycling on the bond strength of self-adhesive cements to fiber posts. *Clin Oral Investig*.
- Mclaren, J. D., Mclaren, C. I., Yaman, P., Bin-Shuwaish, M. S., Dennison, J. D. & Mcdonald, N. J. 2009. The effect of post type and length on the fracture resistance of endodontically treated teeth. *J Prosthet Dent*, **101** (3), 174-82.
- Mello, I., Robazza, C. R., Antoniazzi, J. H. & Coil, J. 2008. Influence of different volumes of EDTA for final rinse on smear layer removal. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, **106** (5), e40-3.
- Meng, Q. F., Chen, Y. M., Guang, H. B., Yip, K. H. & Smales, R. J. 2007. Effect of a ferrule and increased clinical crown length on the in vitro fracture resistance of premolars restored using two dowel-and-core systems. *Oper Dent*, **32** (6), 595-601.
- Mentink, A. G., Meeuwissen, R., Kayser, A. F. & Mulder, J. 1993. Survival rate and failure characteristics of the all metal post and core restoration. *J Oral Rehabil*, **20** (5), 455-61.
- Milot, P. & Stein, R. S. 1992. Root fracture in endodontically treated teeth related to post selection and crown design. *J Prosthet Dent*, **68** (3), 428-35.

- Miyasaka, K. & Nakabayashi, N. 2001. Effect of Phenyl-P/HEMA acetone primer on wet bonding to EDTA-conditioned dentin. *Dent Mater*, **17** (6), 499-503.
- Monticelli, F., Goracci, C. & Ferrari, M. 2004. Micromorphology of the fiber post-resin core unit: a scanning electron microscopy evaluation. *Dent Mater*, **20** (2), 176-83.
- Monticelli, F., Goracci, C., Grandini, S., Garcia-Godoy, F. & Ferrari, M. 2005. Scanning electron microscopic evaluation of fiber post-resin core units built up with different resin composites. *Am J Dent*, **18** (1), 61-5.
- Monticelli, F., Osorio, R., Toledano, M., Goracci, C., Tay, F. R. & Ferrari, M. 2006. Improving the quality of the quartz fiber postcore bond using sodium ethoxide etching and combined silane/adhesive coupling. *J Endod*, **32** (5), 447-51.
- Moosavi, H., Maleknejad, F. & Kimyai, S. 2008. Fracture resistance of endodontically-treated teeth restored using three root-reinforcement methods. *J Contemp Dent Pract*, **9** (1), 30-7.
- Morgano, S. M. 1996. Restoration of pulpless teeth: application of traditional principles in present and future contexts. *J Prosthet Dent*, **75** (4), 375-80.
- Morgano, S. M. & Milot, P. 1993. Clinical success of cast metal posts and cores. *J Prosthet Dent*, **70** (1), 11-6.
- Morgano, S. M., Rodrigues, A. H. & Sabrosa, C. E. 2004. Restoration of endodontically treated teeth. *Dent Clin North Am*, **48** (2), vi, 397-416.
- Mou, Y. B., Chen, Y. M., Smales, R. J. & Yip, K. H. 2009. Optimum post and tooth root diameters for a cast post-core system. *Am J Dent*, **22** (5), 311-4.
- Murphy, J. 1998. *Reinforced plastics handbook*, Oxford: Elsevier (p. 63-106).
- Nakajima, M., Kanno, T., Komada, W., Miura, H., Foxton, R. M. & Tagami, J. 2010. Effect of bonded area and/or fiber post placement on the fracture strengths of resin-core reconstructions for pulpless teeth. *Am J Dent*, **23** (6), 300-4.
- Naumann, M., Metzdorf, G., Fokkinga, W., Watzke, R., Sterzenbach, G., Bayne, S. & Rosentritt, M. 2009. Influence of test parameters on in vitro fracture resistance of post-endodontic restorations: a structured review. *J Oral Rehabil*, **36** (4), 299-312.
- Naumann, M., Preuss, A. & Frankenberger, R. 2007. Reinforcement effect of adhesively luted fiber reinforced composite versus titanium posts. *Dent Mater*, **23** (2), 138-44.
- Naumann, M., Sterzenbach, G., Rosentritt, M., Beuer, F. & Frankenberger, R. 2010. In vitro performance of self-adhesive resin cements for post-and-core build-ups: influence of chewing simulation or 1-year storage in 0.5% chloramine solution. *Acta Biomater*, **6** (11), 4389-95.

Newman, M. P., Yaman, P., Dennison, J., Rafter, M. & Billy, E. 2003. Fracture resistance of endodontically treated teeth restored with composite posts. *J Prosthet Dent*, **89** (4), 360-7.

Nissan, J., Barnea, E., Carmon, D., Gross, M. & Assif, D. 2008. Effect of reduced post length on the resistance to fracture of crowned, endodontically treated teeth. *Quintessence Int*, **39** (8), e179-82.

Nissan, J., Dmitry, Y. & Assif, D. 2001. The use of reinforced composite resin cement as compensation for reduced post length. *J Prosthet Dent*, **86** (3), 304-8.

Oliveira Fde, C., Denehy, G. E. & Boyer, D. B. 1987. Fracture resistance of endodontically prepared teeth using various restorative materials. *J Am Dent Assoc*, **115** (1), 57-60.

Oto, T., Yasuda, G., Tsubota, K., Kurokawa, H., Miyazaki, M. & Platt, J. A. 2009. Influence of power density on polymerization behavior and bond strengths of dual-cured resin direct core foundation systems. *Oper Dent*, **34** (2), 192-9.

Panitvisai, P. & Messer, H. H. 1995. Cuspal deflection in molars in relation to endodontic and restorative procedures. *J Endod*, **21** (2), 57-61.

Pegoretti, A., Fambri, L., Zappini, G. & Bianchetti, M. 2002. Finite element analysis of a glass fibre reinforced composite endodontic post. *Biomaterials*, **23** (13), 2667-82.

Peli, J. F., De Jaureguiberry, M. & De Jaureguiberry, I. 1990. [A more efficient lateral condensation]. *Rev Fr Endod*, **9** (2), 41-51.

Perez, B. E., Barbosa, S. H., Melo, R. M., Zamboni, S. C., Ozcan, M., Valandro, L. F. & Bottino, M. A. 2006. Does the thickness of the resin cement affect the bond strength of a fiber post to the root dentin? *Int J Prosthodont*, **19** (6), 606-9.

Plotino, G., Grande, N. M., Bedini, R., Pameijer, C. H. & Somma, F. 2007. Flexural properties of endodontic posts and human root dentin. *Dent Mater*, **23** (9), 1129-35.

Porciani, P. F., Vano, M., Radovic, I., Goracci, C., Grandini, S., Garcia-Godoy, F. & Ferrari, M. 2008. Fracture resistance of fiber posts: combinations of several small posts vs. standardized single post. *Am J Dent*, **21** (6), 373-6.

Qing, H., Zhu, Z., Chao, Y. & Zhang, W. 2007. In vitro evaluation of the fracture resistance of anterior endodontically treated teeth restored with glass fiber and zircon posts. *J Prosthet Dent*, **97** (2), 93-8.

Radcliffe, C. E., Potouridou, L., Qureshi, R., Hababbeh, N., Qualtrough, A., Worthington, H. & Drucker, D. B. 2004. Antimicrobial activity of varying concentrations of sodium hypochlorite on the endodontic microorganisms *Actinomyces israelii*, *A. naeslundii*, *Candida albicans* and *Enterococcus faecalis*. *Int Endod J*, **37** (7), 438-46.

- Raiden, G. C. & Gendelman, H. 1994. Effect of dowel space preparation on the apical seal of root canal fillings. *Endod Dent Traumatol*, **10 (3)**, 109-12.
- Rathke, A., Haj-Omer, D., Muche, R. & Haller, B. 2009. Effectiveness of bonding fiber posts to root canals and composite core build-ups. *Eur J Oral Sci*, **117 (5)**, 604-10.
- Raygot, C. G., Chai, J. & Jameson, D. L. 2001. Fracture resistance and primary failure mode of endodontically treated teeth restored with a carbon fiber-reinforced resin post system in vitro. *Int J Prosthodont*, **14 (2)**, 141-5.
- Reeh, E. S., Douglas, W. H. & Messer, H. H. 1989a. Stiffness of endodontically-treated teeth related to restoration technique. *J Dent Res*, **68 (11)**, 1540-4.
- Reeh, E. S., Messer, H. H. & Douglas, W. H. 1989b. Reduction in tooth stiffness as a result of endodontic and restorative procedures. *J Endod*, **15 (11)**, 512-6.
- Rees, J. S. & Jacobsen, P. H. 1995. Modelling the effects of enamel anisotropy with the finite element method. *J Oral Rehabil*, **22 (6)**, 451-4.
- Reinhardt, R. A., Krejci, R. F., Pao, Y. C. & Stannard, J. G. 1983. Dentin stresses in post-reconstructed teeth with diminishing bone support. *J Dent Res*, **62 (9)**, 1002-8.
- Ricketts, D. N., Tait, C. M. & Higgins, A. J. 2005. Post and core systems, refinements to tooth preparation and cementation. *Br Dent J*, **198 (9)**, 533-41.
- Rivera, E. M. & Yamauchi, M. 1993. Site comparisons of dentine collagen cross-links from extracted human teeth. *Arch Oral Biol*, **38 (7)**, 541-6.
- Robbins, J. W. 1990. Guidelines for the restoration of endodontically treated teeth. *J Am Dent Assoc*, **120 (5)**, 558, 560, 562 passim.
- Rodriguez-Cervantes, P. J., Sancho-Bru, J. L., Barjau-Escribano, A., Forner-Navarro, L., Perez-Gonzalez, A. & Sanchez-Marin, F. T. 2007. Influence of prefabricated post dimensions on restored maxillary central incisors. *J Oral Rehabil*, **34 (2)**, 141-52.
- Rosentritt, M., Naumann, M., Hahnel, S., Handel, G. & Reill, M. 2009. Evaluation of tooth analogs and type of restoration on the fracture resistance of post and core restored incisors. *J Biomed Mater Res B Appl Biomater*, **91 (1)**, 272-6.
- Ross, R. S., Nicholls, J. I. & Harrington, G. W. 1991. A comparison of strains generated during placement of five endodontic posts. *J Endod*, **17 (9)**, 450-6.
- Sadek, F. T., Monticelli, F., Goracci, C., Tay, F. R., Cardoso, P. E. & Ferrari, M. 2007. Bond strength performance of different resin composites used as core materials around fiber posts. *Dent Mater*, **23 (1)**, 95-9.

Santos-Filho, P. C., Castro, C. G., Silva, G. R., Campos, R. E. & Soares, C. J. 2008. Effects of post system and length on the strain and fracture resistance of root filled bovine teeth. *Int Endod J*, **41** (6), 493-501.

Saupe, W. A., Gluskin, A. H. & Radke, R. A., Jr. 1996. A comparative study of fracture resistance between morphologic dowel and cores and a resin-reinforced dowel system in the intraradicular restoration of structurally compromised roots. *Quintessence Int*, **27** (7), 483-91.

Sauro, S., Mannocci, F., Toledano, M., Osorio, R., Pashley, D. H. & Watson, T. F. 2009. EDTA or H3PO4/NaOCl dentine treatments may increase hybrid layers' resistance to degradation: a microtensile bond strength and confocal-micropermeability study. *J Dent*, **37** (4), 279-88.

Schiavetti, R., Garcia-Godoy, F., Toledano, M., Mazzitelli, C., Barlattani, A., Ferrari, M. & Osorio, R. 2010. Comparison of fracture resistance of bonded glass fiber posts at different lengths. *Am J Dent*, **23** (4), 227-30.

Schmage, P., Pfeiffer, P., Pinto, E., Platzner, U. & Nergiz, I. 2009. Influence of oversized dowel space preparation on the bond strengths of FRC posts. *Oper Dent*, **34** (1), 93-101.

Schmitter, M., Lippenberger, S., Rues, S., Gilde, H. & Rammelsberg, P. 2010a. Fracture resistance of incisor teeth restored using fibre-reinforced posts and threaded metal posts: effect of post length, location, pretreatment and cementation of the final restoration. *Int Endod J*, **43** (5), 436-42.

Schmitter, M., Rammelsberg, P., Lenz, J., Scheuber, S., Schweizerhof, K. & Rues, S. 2010b. Teeth restored using fiber-reinforced posts: in vitro fracture tests and finite element analysis. *Acta Biomater*, **6** (9), 3747-54.

Schwartz, R. S. & Robbins, J. W. 2004. Post placement and restoration of endodontically treated teeth: a literature review. *J Endod*, **30** (5), 289-301.

Seefeld, F., Wenz, H. J., Ludwig, K. & Kern, M. 2007. Resistance to fracture and structural characteristics of different fiber reinforced post systems. *Dent Mater*, **23** (3), 265-71.

Sherfudhin, H., Hobeich, J., Carvalho, C. A., Aboushelib, M. N., Sadig, W. & Salameh, Z. 2011. Effect of different ferrule designs on the fracture resistance and failure pattern of endodontically treated teeth restored with fiber posts and all-ceramic crowns. *J Appl Oral Sci*, **19** (1), 28-33.

Sidoli, G. E., King, P. A. & Setchell, D. J. 1997. An in vitro evaluation of a carbon fiber-based post and core system. *J Prosthet Dent*, **78** (1), 5-9.

- Signore, A., Benedicenti, S., Kaitsas, V., Barone, M., Angiero, F. & Ravera, G. 2009. Long-term survival of endodontically treated, maxillary anterior teeth restored with either tapered or parallel-sided glass-fiber posts and full-ceramic crown coverage. *J Dent*, **37** (2), 115-21.
- Silva, N. R., Castro, C. G., Santos-Filho, P. C., Silva, G. R., Campos, R. E., Soares, P. V. & Soares, C. J. 2009. Influence of different post design and composition on stress distribution in maxillary central incisor: Finite element analysis. *Indian J Dent Res*, **20** (2), 153-8.
- Sim, T. P., Knowles, J. C., Ng, Y. L., Shelton, J. & Gulabivala, K. 2001. Effect of sodium hypochlorite on mechanical properties of dentine and tooth surface strain. *Int Endod J*, **34** (2), 120-32.
- Sirimai, S., Riis, D. N. & Morgano, S. M. 1999. An in vitro study of the fracture resistance and the incidence of vertical root fracture of pulpless teeth restored with six post-and-coresystems. *J Prosthet Dent*, **81** (3), 262-9.
- Soares, L. P., De Vasconcellos, A. B., Da Silva, A. H., Sampaio, E. M. & Vianna, G. A. 2010. The relationship between fibre post geometry and flexural properties: an assessment through a modified three-point bending test. *Eur J Prosthodont Restor Dent*, **18** (4), 158-62.
- Sokol, D. J. 1984. Effective use of current core and post concepts. *J Prosthet Dent*, **52** (2), 231-4.
- Sorensen, J. A. & Engelman, M. J. 1990a. Effect of post adaptation on fracture resistance of endodontically treated teeth. *J Prosthet Dent*, **64** (4), 419-24.
- Sorensen, J. A. & Engelman, M. J. 1990b. Ferrule design and fracture resistance of endodontically treated teeth. *J Prosthet Dent*, **63** (5), 529-36.
- Sorensen, J. A. & Martinoff, J. T. 1984a. Clinically significant factors in dowel design. *J Prosthet Dent*, **52** (1), 28-35.
- Sorensen, J. A. & Martinoff, J. T. 1984b. Intracoronal reinforcement and coronal coverage: a study of endodontically treated teeth. *J Prosthet Dent*, **51** (6), 780-4.
- Spazzin, A. O., Galafassi, D., De Meira-Junior, A. D., Braz, R. & Garbin, C. A. 2009. Influence of post and resin cement on stress distribution of maxillary central incisors restored with direct resin composite. *Oper Dent*, **34** (2), 223-9.
- Standlee, J. P. & Caputo, A. A. 1992. The retentive and stress distributing properties of split threaded endodontic dowels. *J Prosthet Dent*, **68** (3), 436-42.
- Standlee, J. P., Caputo, A. A., Collard, E. W. & Pollack, M. H. 1972. Analysis of stress distribution by endodontic posts. *Oral Surg Oral Med Oral Pathol*, **33** (6), 952-60.

- Standlee, J. P., Caputo, A. A. & Hanson, E. C. 1978. Retention of endodontic dowels: effects of cement, dowel length, diameter, and design. *J Prosthet Dent*, **39** (4), 400-5.
- Standlee, J. P., Caputo, A. A. & Holcomb, J. P. 1982. The Dentatus screw: comparative stress analysis with other endodontic dowel designs. *J Oral Rehabil*, **9** (1), 23-33.
- Stern, N. & Hirshfeld, Z. 1973. Principles of preparing endodontically treated teeth for dowel and core restorations. *J Prosthet Dent*, **30** (2), 162-5.
- Stricker, E. J. & Gohring, T. N. 2006. Influence of different posts and cores on marginal adaptation, fracture resistance, and fracture mode of composite resin crowns on human mandibular premolars. An in vitro study. *J Dent*, **34** (5), 326-35.
- Strub, J. R., Pontius, O. & Koutayas, S. 2001. Survival rate and fracture strength of incisors restored with different post and core systems after exposure in the artificial mouth. *J Oral Rehabil*, **28** (2), 120-4.
- Tait, C. M., Ricketts, D. N. & Higgins, A. J. 2005. Restoration of the root-filled tooth: pre-operative assessment. *Br Dent J*, **198** (7), 395-404.
- Tan, P. L., Aquilino, S. A., Gratton, D. G., Stanford, C. M., Tan, S. C., Johnson, W. T. & Dawson, D. 2005. In vitro fracture resistance of endodontically treated central incisors with varying ferrule heights and configurations. *J Prosthet Dent*, **93** (4), 331-6.
- Tay, F. R. & Pashley, D. H. 2007. Monoblocks in root canals: a hypothetical or a tangible goal. *J Endod*, **33** (4), 391-8.
- Terry, D. A., Triolo, P. T., Jr. & Swift, E. J., Jr. 2001. Fabrication of direct fiber-reinforced posts: a structural design concept. *J Esthet Restor Dent*, **13** (4), 228-40.
- Tezvergil, A., Lassila, L. V. & Vallittu, P. K. 2003. Strength of adhesive-bonded fiber-reinforced composites to enamel and dentin substrates. *J Adhes Dent*, **5** (4), 301-11.
- Tilk, M. A., Lommel, T. J. & Gerstein, H. 1979. A study of mandibular and maxillary root widths to determine dowel size. *J Endod*, **5** (3), 79-82.
- Tjan, A. H. & Whang, S. B. 1985. Resistance to root fracture of dowel channels with various thicknesses of buccal dentin walls. *J Prosthet Dent*, **53** (4), 496-500.
- Toman, M., Toksavul, S., Sarikanat, M., Nergiz, I. & Schmage, P. 2010. Fracture resistance of endodontically treated teeth: effect of tooth coloured post material and surface conditioning. *Eur J Prosthodont Restor Dent*, **18** (1), 23-30.
- Torbjorner, A., Karlsson, S., Syverud, M. & Hensten-Pettersen, A. 1996. Carbon fiber reinforced root canal posts. Mechanical and cytotoxic properties. *Eur J Oral Sci*, **104** (5-6), 605-11.

Trope, M., Maltz, D. O. & Tronstad, L. 1985. Resistance to fracture of restored endodontically treated teeth. *Endod Dent Traumatol*, **1 (3)**, 108-11.

Vianna, M. E., Gomes, B. P., Berber, V. B., Zaia, A. A., Ferraz, C. C. & De Souza-Filho, F. J. 2004. In vitro evaluation of the antimicrobial activity of chlorhexidine and sodium hypochlorite. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, **97 (1)**, 79-84.

Vichi, A., Carrabba, M., Goracci, C. & Ferrari, M. 2011. Extent of Cement Polymerization Along Dowel Space as a Function of the Interaction Between Adhesive and Cement in Fiber Post Cementation. *J Adhes Dent*.

Wakabayashi, N. & Anusavice, K. J. 2000. Crack initiation modes in bilayered alumina/porcelain disks as a function of core/veneer thickness ratio and supporting substrate stiffness. *J Dent Res*, **79 (6)**, 1398-404.

Yeh, C. J. 1997. Fatigue root fracture: a spontaneous root fracture in non-endodontically treated teeth. *Br Dent J*, **182 (7)**, 261-6.

Zillich, R. M. & Corcoran, J. F. 1984. Average maximum post lengths in endodontically treated teeth. *J Prosthet Dent*, **52 (4)**, 489-91.

Zmener, O. 1980. Adaptation of threaded dowels to dentin. *J Prosthet Dent*, **43 (5)**, 530-5.