

REFERENCES

1. Samuels RH, Rudge SJ, Mair LH. A comparison of the rate of space closure using a nickel-titanium spring and an elastic module: a clinical study. *Am J Orthod Dentofacial Orthop.* 1993 May;103(5):464-7.
2. Bishara SE, Andreasen GF. A comparison of time related forces between plastic alastiks and latex elastics. *Angle Orthod.* 1970 Oct;40(4):319-28.
3. Nattrass C, Ireland AJ, Sherriff M. The effect of environmental factors on elastomeric chain and nickel titanium coil springs. *Eur J Orthod.* 1998 Apr;20(2):169-76.
4. Han S, Quick DC. Nickel-titanium spring properties in a simulated oral environment. *Angle Orthod.* 1993 Spring;63(1):67-72.
5. Sonis AL. Comparison of NiTi coil springs vs. elastics in canine retraction. *J Clin Orthod.* 1994 May;28(5):293-5.
6. Samuels RH, Rudge SJ, Mair LH. A clinical study of space closure with nickel-titanium closed coil springs and an elastic module. *Am J Orthod Dentofacial Orthop.* 1998 Jul;114(1):73-9.
7. Dixon V, Read MJ, O'Brien KD, Worthington HV, Mandall NA. A randomized clinical trial to compare three methods of orthodontic space closure. *J Orthod.* 2002 Mar;29(1):31-6.
8. Nightingale C, Jones SP. A clinical investigation of force delivery systems for orthodontic space closure. *J Orthod.* 2003 Sep;30(3):229-36.
9. Alhashimi N, Frithiof L, Brudvik P, Bakhet M. Orthodontic tooth movement and de novo synthesis of proinflammatory cytokines. *Am J Orthod Dentofacial Orthop.* 2001;119(3):307-12.
10. Uematsu S, Mogi M, Deguchi T. Interleukin (IL)-1 beta, IL-6, tumor necrosis factor-alpha, epidermal growth factor, and beta 2-microglobulin levels are elevated

in gingival crevicular fluid during human orthodontic tooth movement. *J Dent Res.* 1996 Jan;75(1):562-7.

11. Proffit W, Fields W, Ackerman J, Bailey L, Tulloch C. *Contemporary Orthodontics.* third ed: St.Louis: Mosby; 2000.p.296-326.
12. Troen BR. Molecular mechanisms underlying osteoclast formation and activation. *Exp Gerontol.* 2003 Jun;38(6):605-14.
13. Davidovitch Z, Nicolay OF, Ngan PW, Shanfeld JL. Neurotransmitters, cytokines, and the control of alveolar bone remodeling in orthodontics. *Dent Clin North Am.* 1988 Jul;32(3):411-35.
14. Bendre MS, Montague DC, Peery T, Akel NS, Gaddy D, Suva LJ. Interleukin-8 stimulation of osteoclastogenesis and bone resorption is a mechanism for the increased osteolysis of metastatic bone disease. *Bone.* 2003 Jul;33(1):28-37.
15. Yamasaki K, Miura F, Suda T. Prostaglandin as a mediator of bone resorption induced by experimental tooth movement in rats. *J Dent Res.* 1980 Oct;59 (10):1635-42.
16. Yamasaki K, Shibata Y, Imai S, Tani Y, Shibusaki Y, Fukuhara T. Clinical application of prostaglandin E1 (PGE1) upon orthodontic tooth movement. *Dentofac Orthop.* 1984 Jun;85(6):508-18.
17. Sekhavat AR, Mousavizadeh K, Pakshir HR, Aslani FS. Effect of misoprostol, a prostaglandin E1 analog, on orthodontic tooth movement in rats. *Am J Orthod Dentofacial Orthop.* 2002 Nov;122(5):542-7.
18. Seifi M, Eslami B, Saffar AS. The effect of prostaglandin E2 and calcium gluconate on orthodontic tooth movement and root resorption in rats. *Eur J Orthod.* 2003 Apr;25(2):199-204.
19. Insoft M, King GJ, Keeling SD. The measurement of acid and alkaline phosphatase in gingival crevicular fluid during orthodontic tooth movement. *Am J Orthod Dentofacial Orthop.* 1996 Mar;109(3):287-96.
20. Nicola NA. *Guidebook to cytokines and receptors.* 1st ed: A Sambrook and Tooze publication; 1994.

21. Chung RM, Grbic JT, Lamster IB. Interleukin-8 and beta-glucuronidase in gingival crevicular fluid. *J Clin Periodontol.* 1997 Mar;24(3):146-52.
22. Grieve WG, 3rd, Johnson GK, Moore RN, Reinhardt RA, DuBois LM. Prostaglandin E (PGE) and interleukin-1 beta (IL-1 beta) levels in gingival crevicular fluid during human orthodontic tooth movement. *Am J Orthod Dentofacial Orthop.* 1994 Apr;105(4):369-74.
23. Iwasaki LR, Haack JE, Nickel JC, Reinhardt RA, Petro TM. Human interleukin-1 beta and interleukin-1 receptor antagonist secretion and velocity of tooth movement. *Arch Oral Biol.* 2001 Feb;46(2):185-9.
24. Lee KJ, Park YC, Yu HS, Choi SH, Yoo YJ. Effects of continuous and interrupted orthodontic force on interleukin-1beta and prostaglandin E2 production in gingival crevicular fluid. *Am J Orthod Dentofacial Orthop.* 2004 Feb;125(2):168-77.
25. Payne JB, Reinhardt RA, Masada MP, DuBois LM, Allison AC. Gingival crevicular fluid IL-8: correlation with local IL-1 beta levels and patient estrogen status. *J Periodontal Res.* 1993 Nov;28(6 Pt 1):451-3.
26. Mostafa YA, Weakly-Dybvig M, Osdoby P. Orchestration of tooth movement. *Am J Orthod Dentofac Orthop.* 1983 Mar;83(3):245-50.
27. Fukada E, Yasuda I. On the piezoelectric effect of bone healing. *J Physiol Soc Jpn.* 1957;12:1158-62.
28. Hassler CR, Rybicki EF, Diegle RB, Clark LC. Studies of enhanced bone healing via electrical stimuli. Comparative effectiveness of various parameters. *Clin Orthop Relat Res.* 1977 May(124):9-19.
29. Becker RO, Spadaro JA, Marino AA. Clinical experiences with low intensity direct current stimulation of bone growth. *Clin Orthop Relat Res.* 1977 May(124):75-83.
30. Davidovitch Z, Finkelson MD, Steigman S, Shanfeld JL, Montgomery PC, Korostoff E. Electric currents, bone remodeling, and orthodontic tooth movement. II. Increase in rate of tooth movement and periodontal cyclic nucleotide levels by combined force and electric current. *Dentofac Orthop.* 1980 Jan;77(1):33-47.

31. Davidovitch Z, Finkelson MD, Steigman S, Shanfeld JL, Montgomery PC, Korostoff E. Electric currents, bone remodeling, and orthodontic tooth movement. I. The effect of electric currents on periodontal cyclic nucleotides. *Dentofac Orthop.* 1980 Jan;77(1):14-32.
32. Tuncer BB, Ozmeric N, Tuncer C, Teoman I, Cakilci B, Yucel A, et al. Levels of interleukin-8 during tooth movement. *Angle Orthod.* 2005 Jul;75(4):631-6.
33. Yamaguchi M, Kojima T, Kanekawa M, Aihara N, Nogimura A, Kasai K. Neuropeptides stimulate production of interleukin-1 beta, interleukin-6, and tumor necrosis factor-alpha in human dental pulp cells. *Inflamm Res.* 2004 May;53(5):199-204.
34. Tosi MF. Innate immune responses to infection. *J Allergy Clin Immunol.* 2005 Aug;116(2):241-9; quiz 50.
35. Sandy JR, Farndale RW, Meikle MC. Recent advances in understanding mechanically induced bone remodeling and their relevance to orthodontic theory and practice. *Am J Orthod Dentofacial Orthop.* 1993 Mar;103(3):212-22.
36. Cruse JM, Lewis RE. *Atlas of Immunology.* First ed. U.S.A.: CRC Press.; 1999.p.187-230.
37. Klein DC, Raisz LG. Prostaglandins: stimulation of bone resorption in tissue culture. *Endocrinology.* 1970 Jun;86(6):1436-40.
38. Dinarello CA. Interleukin-1--its multiple biological effects and its association with hemodialysis. *Blood Purif.* 1988;6(3):164-72.
39. Leiker BJ, Nanda RS, Currier GF, Howes RI, Sinha PK. The effects of exogenous prostaglandins on orthodontic tooth movement in rats. *Am J Orthod Dentofacial Orthop.* 1995 Oct;108(4):380-8.
40. Saito M, Saito S, Ngan PW, Shanfeld J, Davidovitch Z. Interleukin 1 beta and prostaglandin E are involved in the response of periodontal cells to mechanical stress in vivo and in vitro. *Am J Orthod Dentofacial Orthop.* 1991 Mar;99(3):226-40.
41. Raz A, Wyche A, Siegel N, Needleman P. Regulation of fibroblast cyclooxygenase synthesis by interleukin-1. *J Biol Chem.* 1988 Feb 25;263(6):3022-8.

42. Thomson A. **The cytokine handbook.** Third ed. U.S.A: Academic Press; 1998.p.1-20.
43. Suda T, Udagawa N, Takahashi N. **Principles of Bone Biology:** Academic Press; 1996.p.87-103.
44. Johnson GK, Poore TK, Squier CA, Wertz PW, Reinhardt RA, Vincent SD. Prostaglandin E2 and interleukin-1 levels in smokeless tobacco-induced oral mucosal lesions. *J Periodontal Res.* 1994 Nov;29(6):430-8.
45. Ngan PW, Crock B, Varghese J, Lanese R, Shanfeld J, Davidovitch Z. Immunohistochemical assessment of the effect of chemical and mechanical stimuli on cAMP and prostaglandin E levels in human gingival fibroblasts in vitro. *Arch Oral Biol.* 1988;33 (3):163-74.
46. Al-Qawasmi RA, Hartsfield JK, Jr., Everett ET, Flury L, Liu L, Foroud TM, et al. Genetic predisposition to external apical root resorption. *Am J Orthod Dentofacial Orthop.* 2003 Mar;123(3):242-52.
47. Shapira J, Berenstein-Ajzman G, Engelhard D, Cahan S, Kalickman I, Barak V. Cytokine levels in gingival crevicular fluid of erupting primary teeth correlated with systemic disturbances accompanying teething. *Pediatr Dent.* 2003;25:441-8.
48. Dinarello CA. **Interleukins: Molecular Biology and Immunology.** First ed. Basel (Switzerland): Karger; 1992.p.1-32.
49. Ren Y, Maltha JC, Van't Hof MA, Von Den Hoff JW, Kuijpers-Jagtman AM, Zhang D. Cytokine levels in crevicular fluid are less responsive to orthodontic force in adults than in juveniles. *J Clin Periodontol.* 2002 Aug;29(8):757-62.
50. Rothe L, Collin-Osdoby P, Chen Y, Sunyer T, Chaudhary L, Tsay A, et al. Human osteoclasts and osteoclast-like cells synthesize and release high basal and inflammatory stimulated levels of the potent chemokine interleukin-8. *Endocrinology.* 1998 Oct;139(10):4353-63.
51. Gur A, Denli A, Nas K, Cevik R, Karakoc M, Sarac AJ, et al. Possible pathogenetic role of new cytokines in postmenopausal osteoporosis and changes during calcitonin plus calcium therapy. *Rheumatol Int.* 2002 Sep;22(5):194-8.

52. Tsai CC, Ho YP, Chen CC. Levels of interleukin-1 beta and interleukin-8 in gingival crevicular fluids in adult periodontitis. *J Periodontol.* 1995 Oct;66(10):852-9.
53. Lowney JJ, Norton LA, Shafer DM, Rossomando EF. Orthodontic forces increase tumor necrosis factor alpha in the human gingival sulcus. *Am J Orthod Dentofacial Orthop.* 1995 Nov;108(5):519-24.
54. Burstone MS. Histochemical demonstration of acid phosphatase activity in osteoclasts. *J Histochem Cytochem.* 1959 Jan;7(1):39-41.
55. Robinson R. The possible significance of hexophosphoric ester in ossification. *Biochem J.* 1923;17:286-93.
56. Clauss M, Weich H, Breier G, Knies U, Rockl W, Waltenberger J, et al. The vascular endothelial growth factor receptor Flt-1 mediates biological activities. Implications for a functional role of placenta growth factor in monocyte activation and chemotaxis. *J Biol Chem.* 1996 Jul 26;271(30):17629-34.
57. Kaku M, Kohno S, Kawata T, Fujita I, Tokimasa C, Tsutsui K, et al. Effects of vascular endothelial growth factor on osteoclast induction during tooth movement in mice. *J Dent Res.* 2001 Oct;80(10):1880-3.
58. Kohno S, Kaku M, Tsutsui K, Motokawa M, Ohtani J, Tenjo K, et al. Expression of vascular endothelial growth factor and the effects on bone remodeling during experimental tooth movement. *J Dent Res.* 2003 Mar;82(3):177-82.
59. Kohno S, Kaku M, Kawata T, Fujita T, Tsutsui K, Ohtani J, et al. Neutralizing effects of an anti-vascular endothelial growth factor antibody on tooth movement. *Angle Orthod.* 2005 Sep;75(5):797-804.
60. Boester CH, Johnston LE. A clinical investigation of the concepts of differential and optimal force in canine retraction. *Angle Orthod.* 1974 Apr;44(2):113-9.
61. Miura F, Mogi M, Ohura Y, Karibe M. The super-elastic Japanese NiTi alloy wire for use in orthodontics. Part III. Studies on the Japanese NiTi alloy coil springs. *Am J Orthod Dentofacial Orthop.* 1988 Aug;94(2):89-96.

62. Angolkar PV, Arnold JV, Nanda RS, Duncanson MG, Jr. Force degradation of closed coil springs: an in vitro evaluation. *Am J Orthod Dentofacial Orthop.* 1992 Aug;102(2):127-33.
63. Lu TC, Wang WN, Tarng TH, Chen JW. Force decay of elastomeric chain--a serial study. Part II. *Am J Orthod Dentofacial Orthop.* 1993 Oct;104(4):373-7.
64. O' Leary TJ, Drake RB, Naylor JE. The plaque control record. *J Periodontol.* 1972;43:38.
65. Loe H. The gingival index, the plaque index and the retention index system. *J Periodontol* 1967;38:610.
66. Paolantonio M, Di Placido G, Tumini V, Di Stilio M, Contento A, Spoto G. Aspartate aminotransferase activity in crevicular fluid from dental implants. *J Periodontol.* 2000 Jul;71(7):1151-7.
67. Almeida MA, Phillips C, Kula K, Tulloch C. Stability of the palatal rugae as landmarks for analysis of dental casts. *Angle Orthod.* 1995;65(1):43-8.
68. Bailey LT, Esmailnejad A, Almeida MA. Stability of the palatal rugae as landmarks for analysis of dental casts in extraction and nonextraction cases. *Angle Orthod.* 1996;66(1):73-8.
69. Hoggan BR, Sadowsky C. The use of palatal rugae for the assessment of anteroposterior tooth movements. *Am J Orthod Dentofacial Orthop.* 2001 May;119(5):482-8.
70. Sakai A, Ohshima M, Sugano N, Otsuka K, Ito K. Profiling the cytokines in gingival crevicular fluid using a cytokine antibody array. *J Periodontol.* 2006 May;77(5):856-64.
71. Kurdowska AK, Noble JM, Adcock JE. Interleukin-8 and anti-interleukin-8 autoantibodies in gingival crevicular fluid from patients with periodontitis. *J Periodontal Res.* 2003 Feb;38(1):73-8.
72. Graber T, Vanarsdall R. *Orthodontics current principles and techniques.* third ed: St. Louis: Mosby;; 2000.p.117-193.

73. Parfitt AM. Osteoclast precursors as leukocytes: importance of the area code. *Bone*. 1998;23:491-5.
74. Gibson JM, King GJ, Keeling SD. Long-term orthodontic tooth movement response to short-term force in the rat. *Angle Orthod*. 1992 Fall;62(3):211-5; discussion 6.
75. Owman-Moll P, Kurol J, Lundgren D. Continuous versus interrupted continuous orthodontic force related to early tooth movement and root resorption. *Angle Orthod*. 1995;65(6):395-401; discussion -2.
76. Storey E, Smith R. Force in orthodontics and its relation to tooth movement. *Aust Dent J*. 1952;56:11-8.