- | Periodont Res 1979; 14: 512-519.
- Bartold PM, Page RC. The effect of chronic inflammation on gingival connective tissue proteoglycans and hyaluronic acid. J Oral Pathol 1986: 15: 367–374.
- Yamalik N, Kilinc K, Caglayan F, Eratalay K,
 Caglayan G. Molecular size distribution analysis of
 human gingival proteoglycans and
 glycosaminoglycans in specific periodontal diseases.
 J Clin Periodontol 1998; 25: 145–152.
- Tipler LS, Embery G. Glycosaminoglycandepolymerizing enzymes produced by anaerobic bacteria isolated from the human mouth. Arch Oral Biol 1985; 30: 391–396.
- Waddington RJ, Moseley R, Embery G. Reactive oxygen species – a potential role in the pathogenesis of periodontal diseases. *Oral Dis* 2000; 6: 138–151.
- Moseley R, Waddington RJ, Evans P, Halliwell B, Embery G. The chemical modification of glycosaminoglycan structure by oxygen-derived species in vitro. Biochim Biophys Acta 1995; 1244: 245–252.
- Moseley R, Waddington RJ, Embery G.
 Degradation of glycosaminoglycans by reactive oxygen species, derived from stimulated polymorphonuclear leukocytes. *Biochim Biophys Acta* 1997; 1362: 221–231.
- Laurent TC (ed.). The Chemistry, Biology and Medical Applications of Hyaluronan and its Derivatives.
 Wenner-Gren International Series, volume 72.
 London: Portland Press, 1998.
- Chen WY, Abatangelo G. Functions of hyaluronan in wound repair. Wound Rep Reg 1999; 7: 79–89.
- Bertolami CN, Messadi DV. The role of proteoglycans in hard and soft tissue repair. Crit Rev Oral Biol Med 1994; 5: 311–337.
- Häkkinen L, Uitto V-J, Larjava H. Cell biology of gingival wound healing. *Periodontol* 2000 2000; 24: 127–152.
- Weigel PH, Frost SJ, M^cGary CT, LeBoeuf RD. The role of hyaluronic acid in inflammation and wound healing. Int J Tiss React 1988; 10: 355–365.
- Oksala O, Salo T, Tammi R et al. Expression of proteoglycans and hyaluronan during wound healing. J Histochem Cytochem 1995; 43: 125–135.
- Larjava H, Heino A, Kähäri V-M, Krusius T, Vuorio E. Characterization of one phenotype of human periodontal granulation tissue fibroblast. I Dent Res

- 1989; 68: 20-25.
- LeBeouf RD, Gregg R, Weigel PH, Fuller GM. The effects of hyaluronic acid on the conversion of fibrinogen to fibrin and on fibrin gel structure. J Cell Biol 1985; 101: 340–345.
- Kobayashi H,Terao T. Hyaluronic acid-specific regulation of cytokines by human uterine fibroblasts. Am J Physiol 1997; 276: C1151–C1159.
- Mohamadzadeh M, DeGrendale H, Arizpe H, Estess P, Siegelman M. Proinflammatory stimuli regulate endothelial hyaluronan expression and CD44/HAdependent primary adhesion. J Clin Invest 1998; 101: 97–108.
- Hakansson L, Hallgren R, Venge P. Regulation of granulocyte function by hyaluronic acid. *In vitro* and *in vivo* effects on phagocytosis, locomotion and metabolism. *J Clin Invest* 1980; 66: 298–305.
- Ahlgren T, Jarstand C. Hyaluronic acid enhances phagocytosis of human monocytes in vitro. J Clin Immunol 1984; 4: 246–256.
- Foschi D, Castoldi L, Radaelli E et al. Hyaluronic acid prevents oxygen free-radical damage to granulation tissue: a study in rats. Int J Tiss React 1990; 12: 333– 339.
- Pirnazar P, Wolinsky L, Nachnani S, Haake S, Polloni A, Bernard GW. Bacteriostatic effects of hyaluronic acid. J Periodontol 1999; 70: 370–374.
- Cortivo R, Brun P, Cardarelli L, O'Regan M, Radice M, Abatangelo G. Antioxidant effects of hyaluronan and its alpha-methyl-prednisolone derivative in chondrocyte and cartilage cultures. Semin Arthritis Rheum 1996; 26: 492–501.
- Fukuda K, Tanaka S, Kumano F et al. Hyaluronic acid inhibits interleukin-1-induced superoxide anion in bovine chondrocytes. Inflamm Res 1997; 46: 114–117.
- Wisniewski HG, Vilcek J. TSG-6: An IL-I/TNFinducible protein with anti-inflammatory activity. Cytol Growth Factor Rev 1997; 8: 143–156.
- Bertolami CN, Donoff RB. Identification, characterization and purification of mammalian skin wound hyaluronidase. J Invest Dermatol 1982; 79: 417
- Ruggiero SL, Bertolami CN, Bronson RE, Damiani PJ. Hyaluronidase activity of rabbit skin wound granulation tissue fibroblasts. J Dent Res 1987; 66: 1283–1287.
- 32. Bertolami CN, Day RH, Ellis DG. Separation and properties of rabbit buccal mucosal wound hyaluronidase. *J Dent Res* 1986; **65:** 939–944.

- Lees VC, Fan TP, West DC. Angiogenesis in a delayed vascularization model is accelerated by angiogenic oligosaccharides of hyaluronan. *Lab Invest* 1995; 73: 259–266.
- Deed R, Kumar S, Freemont AJ et al. Early response gene signalling is induced by angiogenic oligosaccharides of hyaluronan in endothelial cells. Inhibition by non-angiogenic, high-molecular-weight hyaluronan. Int J Cancer 1997; 10: 251–256.
- Schor SL, Ellis I, Irwin CR et al. Subpopulations of fetal-like gingival fibroblasts: Characterisation and potential significance for wound healing and the progression of periodontal disease. Oral Dis 1996;
 155–166.
- Ellis I, Banyard J, Schor SL. Differential response of fetal and adult fibroblasts to cytokines: Cell migration and hyaluronan synthesis. *Development* 1997; 124: 1593–1600.
- Goa KL, Benfield P. Hyaluronic acid. A review of its pharmacology and use as a surgical aid in ophthalmology, and its therapeutic potential in joint disease and wound healing. *Drugs* 1994; 47: 536– 566.
- Vangelisti R, Pagnacco A, Erra C. Hyaluronic acid in the topical treatment of inflammatory gingivitis. A preliminary clinical study. Prevenz Assist Dent 1993; 1: 16–20.
- Vangelisti R, Pagnacco A, Erra C. Hyaluronic acid in the topical treatment of gingival inflammations. Preliminary clinical trial. Attual Terapeut Intern 1997;
 1–7.
- Pagnacco A, Vangelisti R, Erra C, Poma A. Doubleblind clinical trial versus placebo of a new sodiumhyaluronate-based gingival gel. Attual Terapeut Intern 1997; 4: 1–5.
- Mantovani S, Sala Tesciat A, Fossati B. Preliminary clinical evaluation of a hyaluronic acid-based product in oral disorders: Double-blind trial. Attual Terapeut Intern 1998; 7: 1–5.
- Pini Prato GP, Rotundo R, Magnani C, Soranzo C.
 Tissue engineering technology for gingival augmentation procedures: A case report. Int J Periodont Restor Dent 2000; 20: 553–559.
- Hunt DR, Jovanovic SA, Wikesjö UME, Wozney JM, Bernard GW. Hyaluronan supports recombinant human bone morphogenic protein-2 induced bone reconstruction of advanced alveolar ridge defects in dogs. A pilot study. J Periodontol 2001; 72: 651–658.

ABSTRACT

BEHIND THE MASK

Surgical Face Masks in the Operating Theatre: Re-examining the Evidence. M.G. Romney *Journal of Hospital Infection* 2001; **47:** 251–256.

With the increased vigilance in cross-infection control over the last decade, we are now used routinely to donning a face mask for operative procedures. Surgical face masks were introduced by a German surgeon in 1897. Over recent

years, the efficacy of face masks has been questioned. This review article examines some of the evidence behind the use of face masks for preventing operative infection and preventing transmission to the operator. On the subject of the former point, the review concluded that the evidence is at best equivocal and there is a paucity of randomized controlled trials. However, some studies have demonstrated that not wearing face masks did not increase the incidence of post-operative infection. The transmission of contaminated aerosols from patient to

operator is more important in dentistry; again, there is little convincing evidence against this practice, although it has been argued that very small particles may still reach the operator's face directly through filter of the mask. The more recent introduction of full face visors has yet to be studied satisfactorily but may offer superior protection. For the time being, the evidence still advocates the use of the face mask for operative procedures.

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