



FIG.2. Morphology and molecular markers of adhesion and maturation of endothelial cells in cultures on Ti/C:H or Ag/C:H layers (concentration range of metals approx. from 1% to 20%). A, B: formation of a confluent cell layer on a-C:H with low concentration of Ti or Ag, respectively; C: dead cells on a-C:H with high concentration of Ag. D, E, F: immunofluorescence staining of vinculin-containing focal adhesion plaques, beta-actin

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References

- [1] Fisher J., Hu X.Q., Tipper J.L., Stewart T.D., Williams S., Stone M.H., Davies C., Hatto P., Bolton J., Riley M., Hardaker C., Isaac G.H., Berry G., Ingham E.: Proc. Inst. Mech. Eng., [H] 216: 219-230, 2002
- [2] Yamazaki K., Litwak P., Tagusari O., Mori T., Kono K., Kameleva M., Watach M., Gordon L., Miyagishima M., Tomioka J., Umezumi M., Outa E., Antaki J.F., Kormos R.L., Koyanagi H., Griffith B.P.: Artif. Organs., 22:466-474, 1998.
- [3] Jones M.I., McColl I.R., Grant D.M., Parker K.G., Parker T.L.: J. Biomed. Mater. Res., 52: 413-421, 2000.
- [4] Schaub R.D., Kameneva M.V., Borovetz H.S., Wagner W.R.: J. Biomed. Mater. Res., 49: 460-468, 2000.
- [5] Krishnan L.K., Varghese N., Muraleedharan C.V., Bhuvaneshwar G.S., Derangere F., Sampeur Y., Suryanarayanan R.: Biomol Eng 19: 251-253, 2002.
- [6] Schroeder A., Francz G., Bruinink A., Hauert R., Mayer J., Wintermantel E: Biomaterials, 21: 449-456, 2000.
- [7] Bačáková L., Stary V., Kofroňová O., Lisá V: J Biomed Mater Res 54: 567-578, 2001.
- [8] Trautner B.W., Darouiche R.O.: Arch. Intern. Med., 164: 842-850, 2004.
- [9] Samuel U., Guggenbichler J.P.: Int. J. Antimicrob. Agents., 2004

23 Suppl 1: S75-S758, 2004.

[10] Boldyryeva H., Hlídek P., Biederman H., Slavinská D., Chokourov A.: Thin Solid Films 442: 86-92, 2003.

[11] Bačáková L., Lisá V., Kubínová L., Wilhelm J., Novotná J., Eckhart A., Herget J.: Virchow's Archiv, 440: 50-62, 2002.

[12] Sato H., Tsuji H., Ikeda S., Ikemoto N., Ishikawa J., Nishimoto S.: J. Biomed. Mater. Res., 44:22-30, 1999.

EVALUATION OF THE EFFECT OF TRANSPHYSEAL BIOABSORBABLE SCREWS ON GROWTH OF RABBIT FEMUR

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Abstract

A self-reinforced bioabsorbable poly-L-lactide/polyglycolide (SR-PLGA) 80/20 screw 2.0 mm in diameter was implanted in a transphyseal location across the distal growth plate of the right femur in 24 immature rabbits. Radiological evaluation revealed a mean shortening of 3.1 mm at 3 weeks ($p=0.050$), 11.1 mm at 6 weeks ($p=0.001$), 9.3 mm at 24 weeks ($p=0.011$), 9.0 mm at 48 weeks ($p=0.009$) and 12.6 mm at 72 weeks ($p=0.002$) compared with the intact contralateral femur. Growth retardation continued for 6 weeks postoperatively (3 versus 6 weeks, $p=0.003$), after which the bones grew normally up to 72 weeks ($p=0.6$). The duration of temporary growth retardation correlated with that of strength retention of the SR-PLGA 80/20 copolymer. These findings suggest that SR-PLGA 80/20 screws can be applied in transphyseal bone fixation. The use of bioabsorbable screws for temporary epiphyseodesis seems attractive but requires further study.

Keywords: Femur, growth, rabbit, SR-PLGA
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