Bioactive materials in otorhinolaryngology

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In 1996 hanch and West defined bioactive material as “one that elicits a specific biological response at the interface of the material which results in the formation of a bond between the tissues and the material.Bioactive materials were used in ORL in 1980 by use hydroxyapatite in ossiculoplasty (Wehrs RE., 1995), 4 years after that the bioglass was introduced in medical practice (Wilson et al., 1993).In our essay we discuss types and uses of bioactive materials such as:1. Hydyroxyapatite which is calcium phosphate ceramic it was used in ossiculoplasty (Van Blitterswijk et al.,1990) in 1997 Moore E.S used hydroxyapatite for inferior turbinet reconstruction, in 1999 it was used by Kasuya and Shimizu to prevent CSF leakage, in 2004 Belafsky and Postma used hydroxyaptite in vocal fold augmentation, in 2005 M. Munjal et al. used hydroxyapatite in obliteration of mastoid cavity and in 2006 Kall and Matti used it for fronto orbital reconstruction.2. Bioglass is a bioactive glass ceramic was used in dental osseous lesion (Shappof et al., 1997), in 2000 Kinnunen et al. used it in reconstruction of orbital floor fractures, in 2000 Peltola et al. used bioglass in frontal sinus obliteration, in 2002 El-Mallah et al., used bioglass in reconstruction of posterior meatal wall, in 2004 El-Sherbiney et al., used it in management of atrophic rhinits, in 2006 Helmy A. et al. used bioglass in ossiculoplasty and in 2006 El Kady A. et al. used it in correction of saddle nose deformity.Bioglass material is a bioactive, biocompatible, provides favorable healing, resist infection, easily prepared and placed, and provides new bone formation without any encapsulation (El-Mllah M. et al., 2002).Stoor et al., (1998) proved that BAG has antibacterial effects.But reshaping properties of bone are better than those of bioactive glass and hydroxyapatite. Dense hydroxyapatite may attain compressive strength of up to 600 Mpa. But it had low resistance against fatigue failure because of its brittleness (DeGroot et al., 1987).The compressive strength decreases with increasing porosity and with increasing levels of tricalcium phosphate in the material. Bioactive glass plates were rigid and couldn’t be molded and shaped by the surgeon. Mechanical compressive strength was lower with cancellous bone but higher with cortical bone than with bioactive glass (Bonfield W. 1984 – Hench IL. et al., 1993 - Ramy et al., 2004).In addition, bioactive glass is very brittle. Rigid bioactive glasses have low fracture toughness and are mechanically weak (Hench and Andersson, 1993). These properties limit the use of bioactive glass and hydroxyapatite in load bearing areas and in clinical conditions where reshaping of the material (e.g., Plates) is mandatory.The properties of biomaterials could provide the conditions for more successful results of treatments and clinical tissue engineering in many more surgical application than before however, basic

surgical experience. Skills, and precision were still significant factors in the surgical applications and protocols of biomaterials (Kalle and Matti, 2006).