J Material Sci Eng 2014, 3:3
http://dx.doi.org/10.4172/2169-0022.S1.017

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Materials Science & Engineering
October 06-08, 2014 Hilton San Antonio Airport, USA

Implants of small joints in hand

Samineh Barmaki
Tampere University of Technology, Finland

Small joints of wrist can be affected by hand arthritis leading to pain and deformity of the joints. Prosthetic development must take in to consideration range of motion, stability, ease of implantation and soft tissue reconstruction. This research is focused on the arthritis of the basal joint of the thumb which most often affects middle-aged women. Several surgical techniques have been described for management of degenerative basal joint changes. These include excision of the trapezium alone, ligament reconstruction with or without tendon interposition (LRTI) and trapezium resection, arthrodesis and multiple arthroplasty options using biologic and synthetic implants, including silastic prostheses, metal prostheses and allograft interpositions. Researchers found out, successful and durable results with ligament reconstruction with or without tendon interposition. However pinch strength was not satisfactory due to shortening of the thumb by trapeziectomy. Joint arthroplasty can aid maintenance of the length of the thumb and provide greater pinch strength. Several studies about silicone implants reported implant wear, synovitis and osteolysis. Metallic implants resulted in implant loosening and instability. Researchers found out a porous poly-L/D-lactide copolymer implant with an L: D monomer ratio of 96:4 (P (L/D) LA 96/4) resulted significant strength and can be replaced with fibrous tissue in 2-3 years. Silicone implant is better at palmar stability compared to PLDLA (poly-L/D-lactide copolymer) implant, whereas lack of silicone synovitis and osteolysis are the advantages of the PLDLA implant. For achieving definite results, longer follow-ups are needed for synthetic allograft and PLDLA implants.

Biography

Samineh Barmaki has completed her BSc in Material Science in ceramic branch from University of Tehran, Science and research branch and MSc in Biomedical Engineering (Major: biomaterials) from Tampere University of Technology in Finland. She was also representative of Biomedical Engineering Department during her master program in university. Her master thesis abstract is also approved as a poster presentation in 26th European Conference on Biomaterials in Liverpool-United Kingdom.

barmaki.samineh@gmail.com

Cisplatin hydrolysis on promoted-SiO2 (100) surfaces

S Simonetti and **Díaz Compañy**
Universidad Nacional del Sur Bahia Blanca, Argentina

Different types of silica are widely used as efficient adsorbents, selective absorbents and active phase carriers in catalysis. Chemical modification of the surface of silica receives special interest because this process allows researchers to regulate and change adsorption properties and technological characteristics. Studies have shown that silica matrixes could improve drug delivery systems. In this work, the cisplatin hydrolysis on a SiO2(100) hydrated surface is investigated by tight binding calculation. Cisplatin (cis-$[PtCl_2(NH_3)_2]$) is a coordination compound, used in the treatment of several solid tumors. Calculations show that, during adsorption, the silica surface maintains their matrix properties and the major changes occur in cisplatin′s molecule. The cisplatin molecule has small interactions with neighbour OH groups of the hydrated surface and the hydrolysis process is not favourable on the SiO_2(100) hydrated surface. The adsorption properties of the SiO2(100) are improved considering the surface's modification with K, Mg or NH_2 promoters. In general, the stability of the system is increased and the molecule/surface distance is reduced when the adsorption is performed using functional groups. The hydrolysis is a favourable process on the SiO_2(100) functionalized surface. The adsorption of cisplatin molecule and their complexs is strengthened. The electron density changes positively affect the adsorption strength of the cisplatin molecule and their complexs. Cisplatin is best adsorbed by NH2 group. The mainly overlap populations correspond to Cl-N, Cl-Si interactions (during cis-[PtCl2(NH3)2] and cis-$[PtCl(NH_3)_2]^+$ adsorption), and Pt-O, Pt-Si, Pt-H interactions (during cis-$[Pt(NH_3)_2]_2$+ adsorption). and Pt-O, Pt-Si, Pt-H interactions (during cis-$[Pt(NH_3)_2]_2^+$ adsorption). After adsorption, the strength of N-Si, Si-O and N-H bond changes favoring the molecule/complexs-surface interaction.

ssimonet@uns.edu.ar