Dental Implant Support Compound

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Technology description

Aids Osseointegration and Bone Regeneration

A dental implant support compound has been designed for use in dental implant surgery to reduce the cases of peri-implantitis in patients with bony defects and unstable or low-quality bone. This fast-setting, osteoconductive compound is made of calcium sulfate, allogeneic bone particles, bone morphogenic protein and an antimicrobial material. When the powder phase of the compound is mixed with saline, it changes to a cement-like consistency that sets within 10 minutes, making it easy for clinical handling and dental surgery. The compound is biocompatible and hydrophilic, making it easy to deliver directly to the bony defect and push against the alveolar bone to form a tight contact. The compound has a high load bearing capacity and maintains its structure between bone and implant. The calcium sulfate dissolves slowly over a two month period to be replaced by newly formed bone, while the antimicrobial component reduces the chance of infection and facilitates new bone formation. This dental compound offers a solution to peri-implantitis and unstable dental implants in low quality bone.

Peri-implantitis and Dental Implant Failure

With increased patient age and lowered bone quality, dental implants become more difficult to successfully insert surgically. Often times, the implant is loose immediately after insertion into the jaw, but the frailty of the bone makes manipulation of the implant difficult. As a result, surgeons will leave the unstable implant, which grows soft tissue around it instead of hard bone. This adds to complications and failure of dental implants. Similarly, dental implants have a tendency to develop a destructive inflammation affecting tissue and bone in a process termed peri-implantitis. The mucosa becomes inflamed around the implant site and there is a loss of supporting bone, resulting in pain and implant failure. There is a need for an effective tool to aid in the regeneration of bone when dealing with cases of loose dental implants in frail bone and peri-implantitis.

Advantages

Quick setting and cement-like consistency allows for easy clinical handling
Dissolves over a two month period, allowing for natural bone to grow
Antimicrobial component fights infection to aid healthy bone regeneration

Institution

University of Minnesota