The SCPC composition combines oxides of Si, Na, Ca and P needed to promote new bone formation [1, 2]. The oxides of SCPC are packed together in a unique crystalline structure made of β-Rhenanite (NaCaPO₄) and α-Cristobalite (SiO₂). It has been shown that β-NaCaPO₄ has the most effect on the differentiation of human bone-derived cells, inducing mRNA and protein expression of osteopontin, osteocalcin, osteonectin, and bone sialoprotein, suggesting later osteoblast differentiation [7]. The silica phase of SCPC facilitates guided bone cell growth and mineralized bone matrix formation [1, 2]. Therefore, the combination of silicate to sodium calcium phosphate in SCPC structure synergistically facilitates a superior biocompatibility, nonimmunogenity, osteoconductivity and new bone tissue formation.

What are the ingredients of SCPC?

Bioactive:
Stimulates bone cell function and tissue formation

Osteoconductive:
Enhance bone cells differentiation and direct bone deposition on the material surface.

Porous:
Allows rapid bone formation, vascularization and graft material resorption

Resorbable:
Allows complete bone regeneration as the body fully resorbs the graft material.

Handling:
Easy to apply, SCPC particles stay in place inside the defect and do not migrate or diffuse.

Biocompatibility:
Nontoxic, non-immunogenic and do not elicit any rejection reaction

Efficiency:
Minimizes the need for autogenous bone in large defects after tumor resection

Radiopacity:
SCPC is radiopaque in X-ray radiograph which makes it easy to follow the progress in bone healing and graft material resorption.

Advantages

ShefaBone SCPC Resorbable Bioactive granules are used as a bone filling material in orthopedic and maxillofacial surgeries. Typical uses include:

• Cystic cavities
• Periodontal / infrabony defects
• Ridge augmentation (sinusotomy, osteotomy, cystectomy)
• Extraction sites (ridge maintenance/augmentation, implant preparation/placement)
• Sinus Lifts
• Oral and maxillofacial augmentation

Indications For Use

ShefaBone SCPC is a new, US patented, resorbable osteoconductive bone graft material made of bioactive silica-calcium phosphate ceramic [1, 2]. SCPC is engineered with unique interconnected porosity and crystalline structure to enhance new bone formation and graft material resorption [3-5]. After implantation, the SCPC develops a carbonate hydroxyapatite surface layer, similar to the mineral phase of bone which facilitates osteoblast attachment and new bone deposition on the surface of SCPC. There is no fibrous encapsulation or immune reaction against SCPC. The porosity of SCPC facilitates penetration of bone cells and blood vessels inside the particles leading to formation of vascularized new bone within the particles. Bone formation in the inner pores and on the outer surface of SCPC particles accelerates regeneration of functioning bone made by the patient own cells. The newly formed bone undergoes remodeling exactly like host bone. As the SCPC resorbs, bone cells deposit new bone that fully replaces the graft material. SCPC has successfully passed all ISO 10993-1 biocompatibility tests and showed complete absence of sensitization, irritation, systemic toxicity, and genotoxicity.
Before SCPC is placed, the treatment area is protected. After Criss-cross and/or mattress sutures are placed. Allow to heal completely.

to size and compressed in place as a dressing (cover the SCPC particles inside the socket or bone defect). Avoid spillage. ShefaBone SCPC granules can be mixed with the patient's blood or sterile saline using a syringe. They are not intended to replace or change standard procedures for treatment of bone defects involving bone grafting and internal fixation. The seal on the vial should be carefully removed to avoid spillage and/or contamination. Underlying oral pathological conditions, such as infections, are considered a major advantage over bone grafts made of calcium phosphate ceramics due to its important property of bone conduction 

ShefaBone SCPC vial is for Single Use Only. The material most widely used as bone substitute. Although evidence of bone growth in porus and dense HA particulates is widespread, the bone conductive effect is limited. Often at a distance away from the bone defect wall, these particulates are encapsulated by fibrous tissue. TCP is more biodegradable than HA, however, it lacks the mechanical properties of HA. Tricalcium phosphate (TCP) does not have a mineral structure to the important role in the upregulation of osteoblastic and cells of osteoid and mineralized skeleton.

Biological bone grafts such as cadaver bone or from patients sources have many limitations related to reoperation due to heterotopic bone formation and/or bone damage. The use of synthetic bioactive glass bone graft has no need to address issues related to problems involving allergic reactions or the potential risks of infection originating from materials like bovine bone, processed bone matrix or cadaveric demineralized freeze-dried bone allograft.

**Why is SCPC better than other calcium phosphate bone grafting materials?**

SCPC is a new, resorbable, porous, bioactive silica-calcium-phosphate composite (SCPC) that has the ability to stimulate rapid bone generation and resorb when graft is used in large bone defects. To enhance bioactivity and resorbability, ion substitution and formation of solid solution were induced in the crystalline phases. Thus, the entire structure of SCPC contains, ion substituted silica and calcium phosphate Modified with Na or and silica. These crystalline phase will synergically enhance bioactivity and resorbability of the material. The role of the silica and calcium-phosphate in the substitution of the mineral regulates its resorption and enhances bone bioactivity property. Second, the silica surface, which was not incorporated in the calcium phosphate, nucleates the precipitation of a carbonated hydroxyapatite layer on the SCPC surface, which stimulates bone cell attachment, differentiation, and tissue formation. Histological analyses showed that the bioactivity and resorbability of SCPC is better than bioactive glass (Figure 2). Bioactive glass forms a carbonate hydroxyapatite layer on the top of a silica-rich layer. The silica-rich layer slows down bone resorption by inhibiting Ca and P ion diffusion from the glass bulk into the surface [6]. The implication for the slow rate of dissolution of SCPC is the slow rate of resorption in vivo.

ShefaBone SCPC grafts should not be used in the treatment of bone defects involving bone grafting and internal fixation. The seal on the vial should be carefully removed to avoid spillage and/or contamination. Underlying oral pathological conditions, such as infections, are considered a major advantage over bone grafts made of calcium phosphate ceramics due to its important property of bone conduction. The material most widely used as bone substitute. Although evidence of bone growth in porus and dense HA particulates is widespread, the bone conductive effect is limited. Often at a distance away from the bone defect wall, these particulates are encapsulated by fibrous tissue. TCP is more biodegradable than HA, however, it lacks the mechanical properties of HA. Tricalcium phosphate (TCP) does not have a mineral structure to the important role in the upregulation of osteoblastic and cells of osteoid and mineralized skeleton.

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**References:**


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