Table 3. Growth factors and its function (Chen et al. 2003).

Growth Factor	Abbreviation	Physiological Function
Basic fibroblast growth factor	bFGF/FGF-2	Proliferation of fibroblasts and initiation of angiogenesis
Bone morphogenetic protein	BMP-2 BMP-7	Differentiation and migration of bone-forming cells
Epidermal growth factors	EGF	Proliferation of epithelial, mesenchymal, and fibroblast cells
Platelet-derived growth factor	PDGF-AA PDGF-AB PDGF-BB	Proliferation and chemoattractant agent for smooth muscle cells; extra cellular matrix synthesis and deposition
Transforming growth factors-α	TGF-α	Migration and proliferation of keratinocytes; extra cellular matrix synthesis and deposition
Transforming growth factors-β	TGF-β	Proliferation and differentiation of bone-forming cells; chemoattractant for fibroblasts
Vascular endothelial growth factor	VEGF	Migration, proliferation, and survival of endothelial cells

Table 4. Cargos for BMP-2 delivery.

Materials	Examples
Ceramics	Hydroxyapatite Bioglass Tri-calcium phosphate (TCP)
Natural biopolymers	Collagen Fibrin Gelatin Alginate Chitosan Hyaluronan
Synthetic polymers	Poly(lactic acid) (PLA) Poly(glycolic acid) (PGA) Poly(lactic-co-glycolic acid) (PLGA) PLA-hyaluronan
Composites	Chitosan-gelatin Poly(caprolactone) (PCL)-collagen–TCP

Hydrogels

There have been many graft substitutes such as decellularized bone matrix, bioglass, calcium phosphate cements, calcium sulfate, hydroxyapatite powder, blocks and shapes (Bohner 2010). However, these materials are difficult to deliver into deeper and more complex shaped skeletal tissues (Kretlow et al. 2009). Injectable ceramic cements tend to become brittle thereby leading to improper repair. Furthermore, scaffolds leave some voids in the defect area, which results in impaired bone healing and regeneration. While considering these limitations, injectable hydrogel systems