Supporting Information

A 3D printed wound cooling system incorporated with injectable, adsorbable, swellable and broad spectrum antibacterial scaffolds for rapid hematischesis processing

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Movie S1.1: It showed the effect of using Ca^{2+} as an ionic cross-linker on swelling properties of scaffolds.

Movie S1.2: It showed the effect of using Al^{3+} as an ionic cross-linker on swelling properties of scaffolds.

Movie S1.3: It showed the effect of using Fe^{3+} as an ionic cross-linker on swelling properties of scaffolds.

Movie S2.1: It showed the hemostatic process by using medical gauze and a weight.

Movie S2.2: It showed the hemostatic process by using hemostatic system with refrigerant.

Movie S2.3: It is confirmed the living of the rabbit after using hemostatic system with refrigerant.

Movie S3: It showed a full-scale view of the injectable wound cooling hemostatic system (IWCHs).

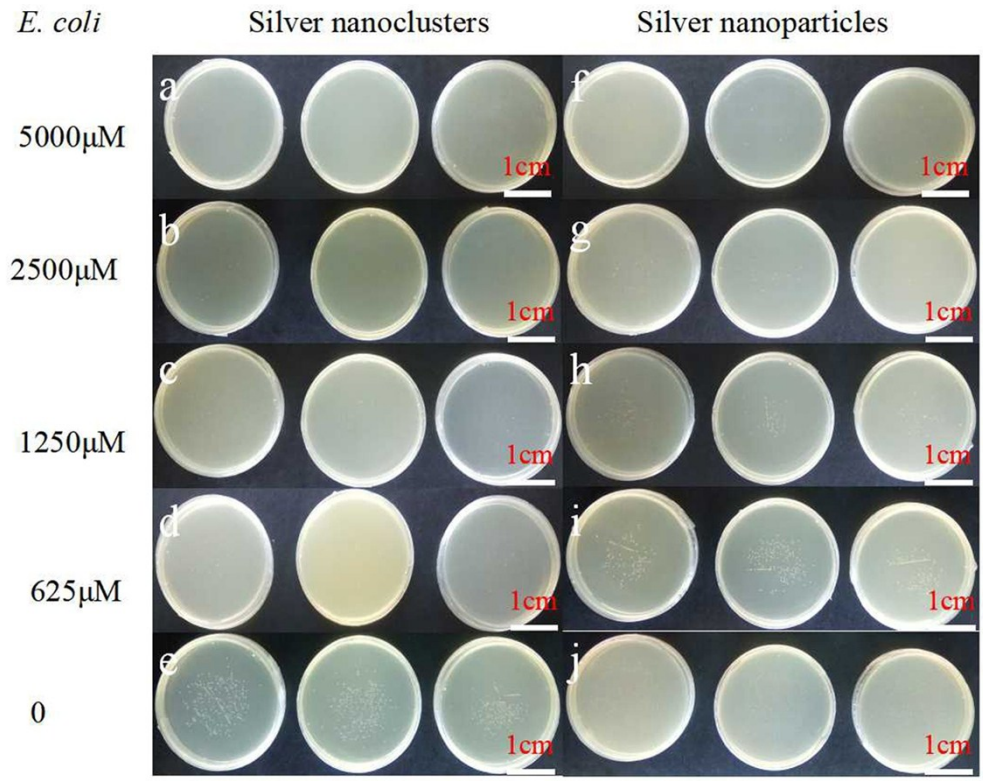

Figure S1. Antimicrobial plate counting photos of *E. coli* in the same concentration gradients of (a-e) AgNCs and (f-j) AgNPs.

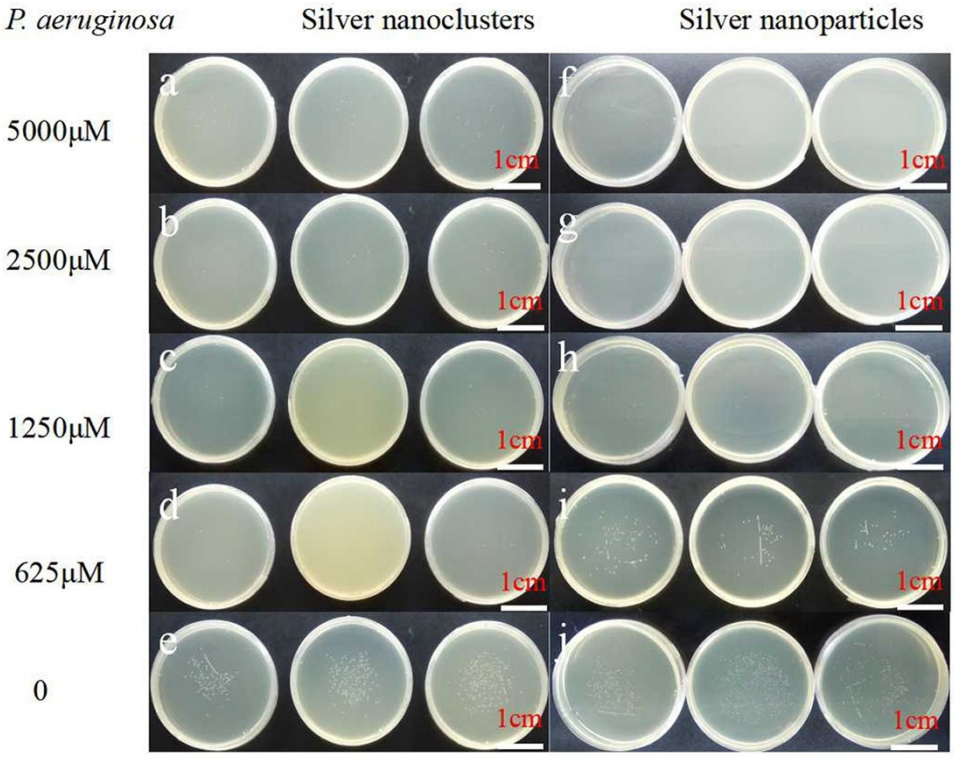

Figure S2. Antimicrobial plate counting photos of *P. aeruginosa* in the same concentration gradients of (a-e) AgNCs and (f-j) AgNPs.

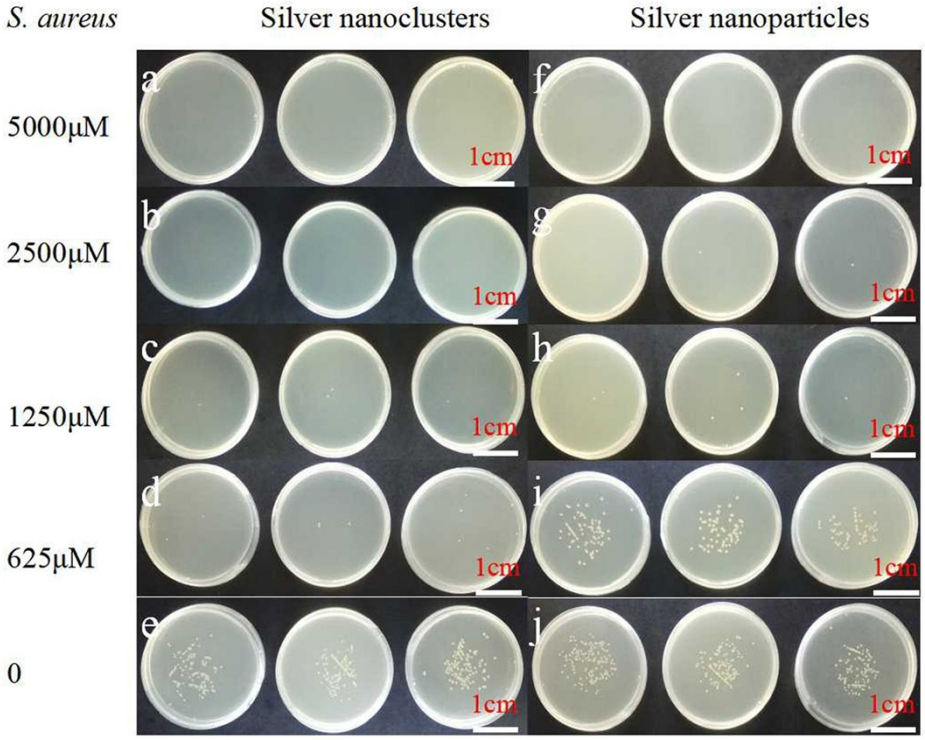

Figure S3. Antimicrobial plate counting photos of *S. aureus* in the same concentration gradients of (a-e) AgNCs and (f-j) AgNPs.

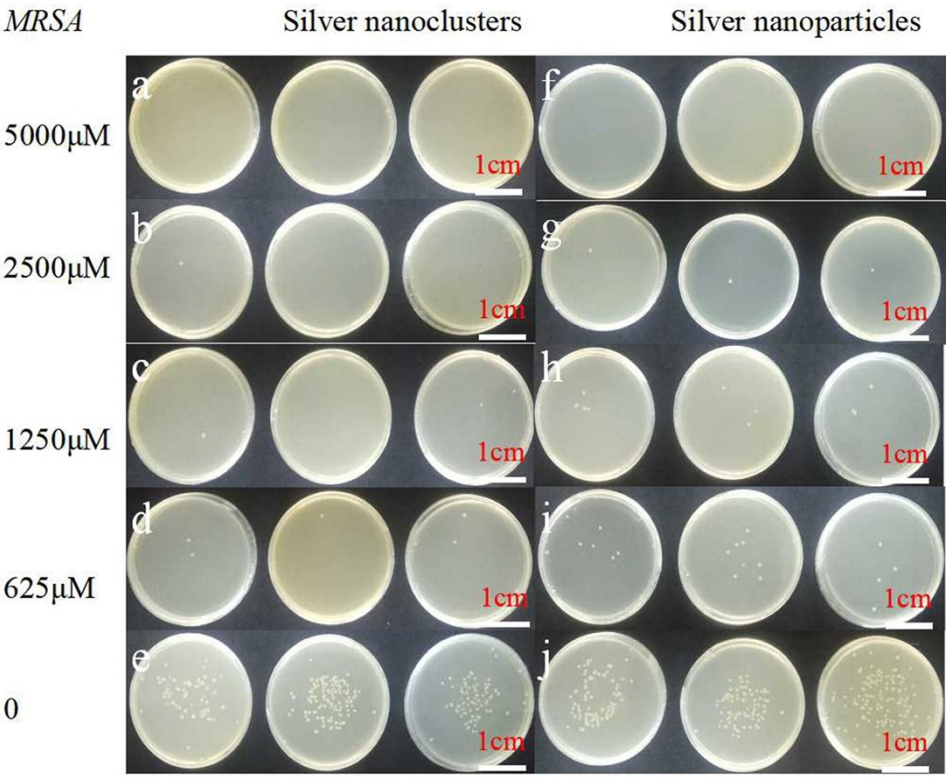

Figure S4. Antimicrobial plate counting photos of *MRSA* in the same concentration gradients of (a-e) AgNCs and (f-j) AgNPs.

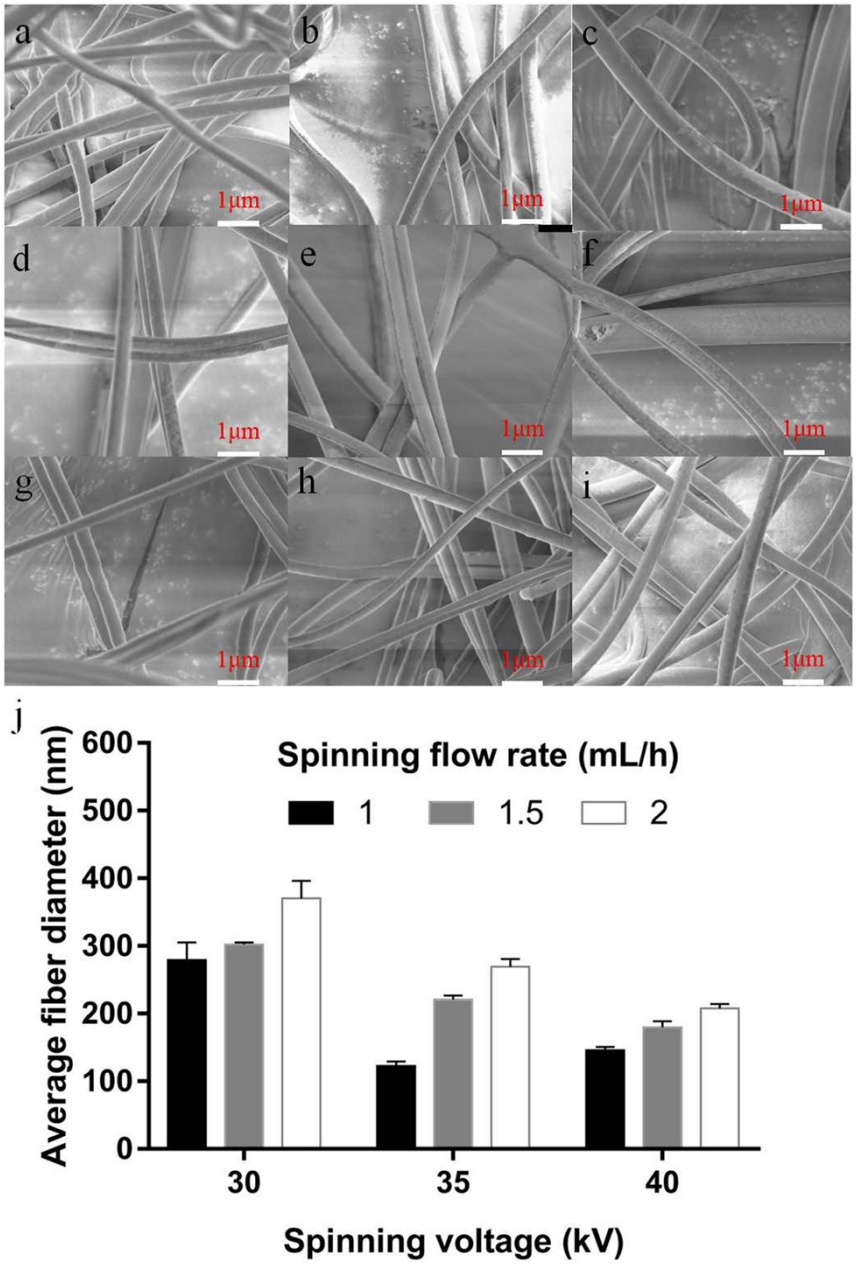

Figure S5. (a-i) The SEM images and (j) corresponding diameters of SiO_2 nanofibers that were prepared at different spinning voltages and different spinning flow rates: (a) Voltage: 30kV, flow rate: 1mL/h; (b) 30, 1.5; (c) 30, 2; (d) 35, 1; (e) 35, 1.5; (f) 35, 2; (g) 40, 1; (h) 40, 1.5; (i) 40, 2.

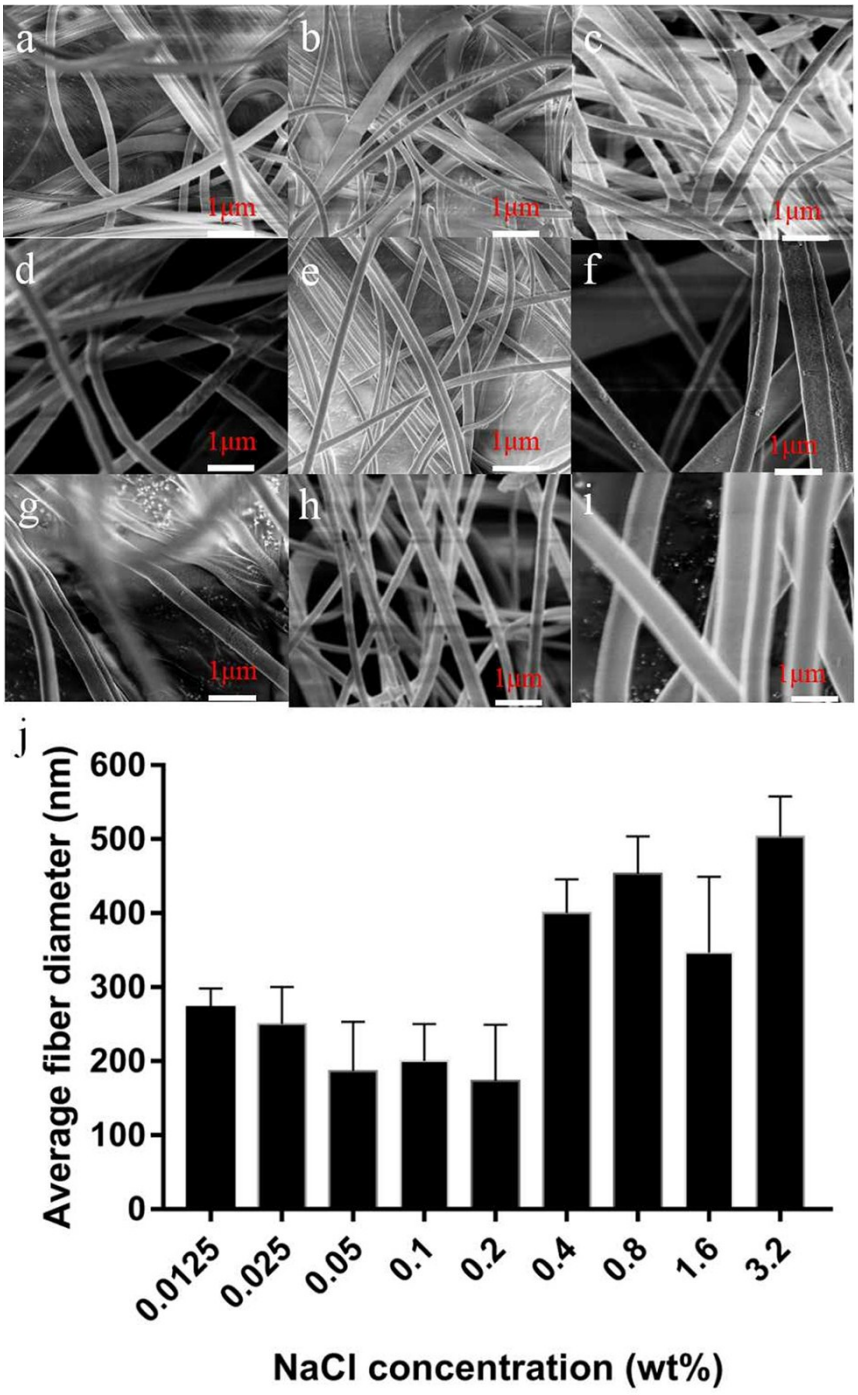

Figure S6. (a-i) The SEM images and (j) corresponding diameters of SiO_2 nanofibers that were prepared from precursor solutions of different NaCl concentrations: (a) NaCl: 0.0125; (b) 0.025; (c) 0.05; (d) 0.1; (e) 0.2; (f) 0.4; (g) 0.8; (h) 1.6; (i) 3.2.

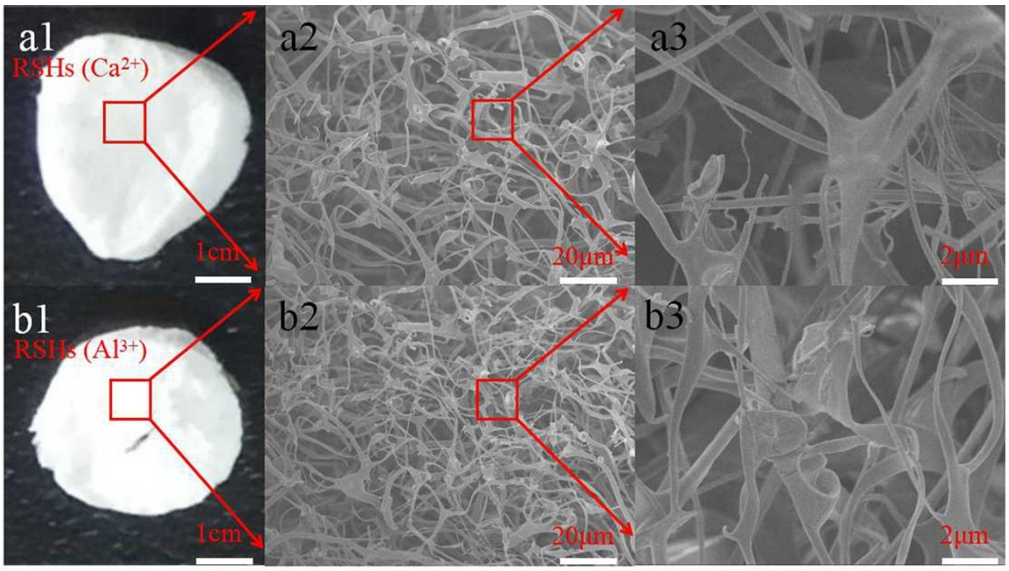

Figure S7. Optical and SEM images of (a1-a3) RSHs crosslinked by calcium ions and (b1-b3) RSHs crosslinked by aluminum ions.

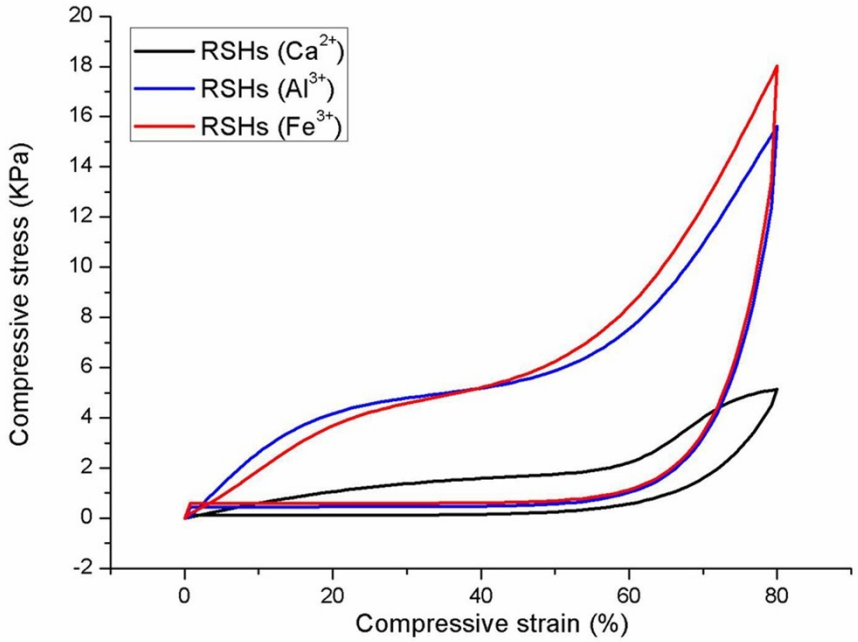

Figure S8. Compressive σ versus ε curves for RSHs crosslinked by three metal ions.

Figure S9. Physical image of the IWCHs. In view of cost and material of 3D printing, we did not print the ideal syringe of containing baffles and chutes in actual experiments. However, from the results of animal experiments, we can know that the current used syringe still able to complete the task of assisting hemostasis better.

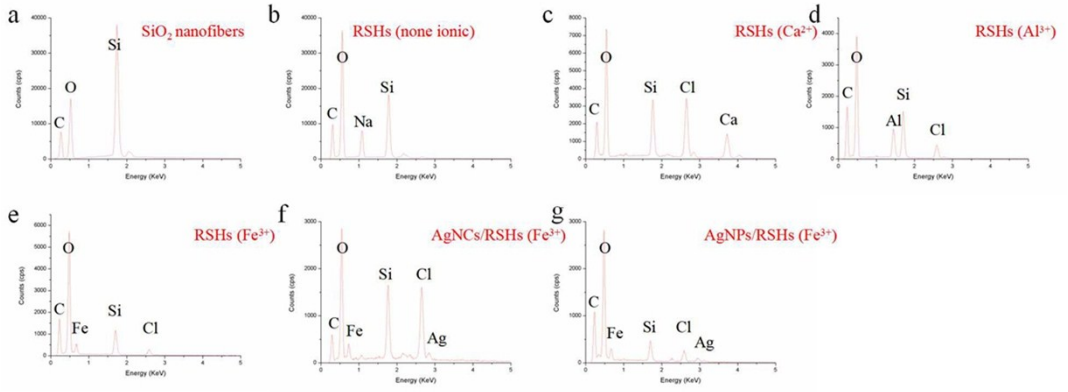

Figure S10. Elemental analysis spectrum of (a) SiO_2 nanofibers, (b) RSHs crosslinked by none ions, (c-e) RSHs crosslinked by three metal ions, (f) AgNCs/RSHs, and (g) AgNPs/RSHs.

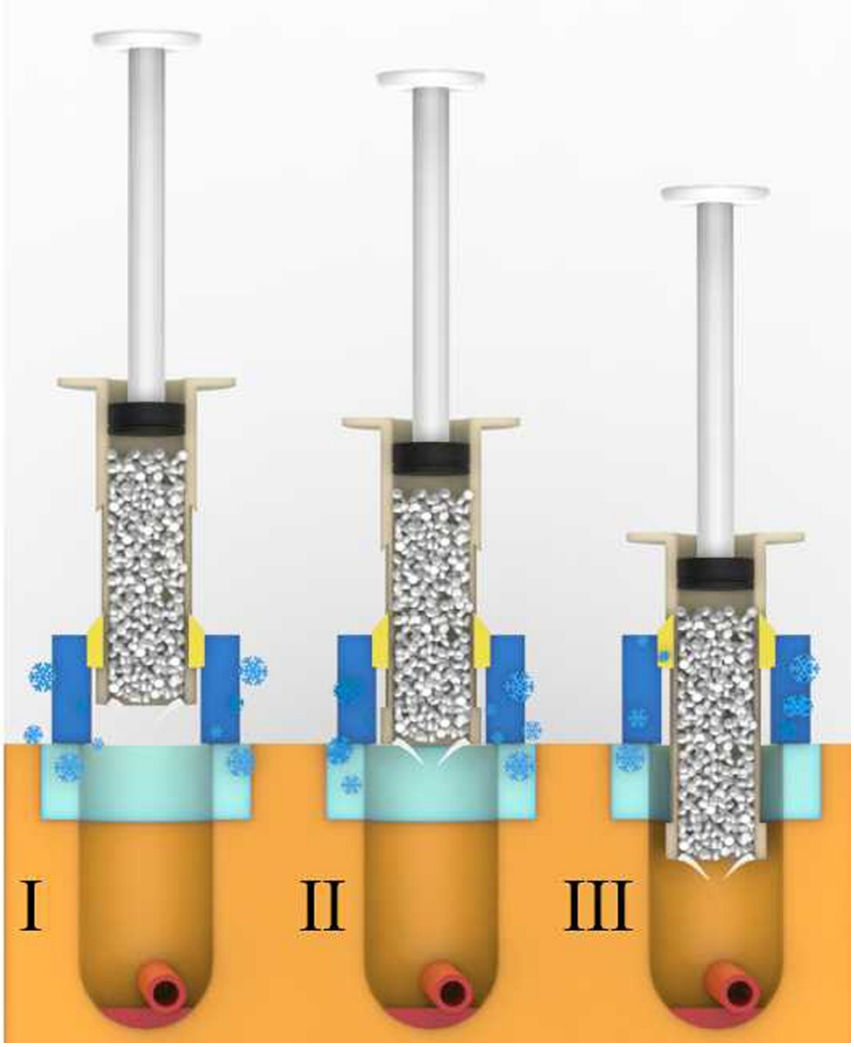

Figure S11. Schematic diagram of the process where the syringe can be freely inserted into the wound.