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Local, sustained delivery of Triamcinolone with an accurate control dose for prevention of fibrosis around silicone implants

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Silicone implants have been widely used in clinical settings for augmentation and reconstruction surgery; however, capsular contracture caused by excessive fibrosis is one of the serious complications. Triamcinolone Acetonide (TA), a steroidal drug, is known to reduce capsular contracture around silicone implants via overall suppression of inflammatory cells and cytokines. However, the therapeutic window is narrow and thus, when exposed too much, the drug may cause the side effects, such as delayed wound healing and muscle atrophy. Therefore, we hypothesized that local, sustained delivery of TA with an accurately controlled dose can properly prevent fibrotic capsule formation around silicone implants without the drug side effects. To test this hypothesis, we coated the surface of the shells of the silicone implants, already in clinical use with TA. Our results revealed that the total loading amount of TA in silicone implants could be determined by regulating the concentration of drug solution used for spray-coating to give two distinct samples of the TA_IM_1 and TA_IM_2. The coated implants herein could release TA in a sustained manner for 12 weeks but at a different release rate in drug amount. Currently, we are performing the *in vivo* experiments by implanting a variety of the prepared samples in rats to find the optimal drug dose and release profile. The tissue samples are biopsied at scheduled times until 12 weeks, which are stained to assess the capsule thickness, collagen density, various inflammatory cells and cytokines for evaluation of fibrosis, and also the muscle and skin thickness for evaluation of drug side effects.

Biography

Beom Su Jeon is a Bioengineering MS student at Seoul National University, Republic of Korea. He has received his BSE in Biomedical Engineering from Chung-Ang University. His current research focuses on the development of drug-loaded medical devices for various applications.

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