

Efek Injeksi Subkutan Epigallocatechin-3-Gallate (EGCG) Terhadap Viabilitas *Extended Random Skin Flap* Tikus Wistar

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Latar Belakang: *Skin flap* banyak digunakan di bidang operasi plastik, namun flap nekrotik juga umum terjadi. Berdasarkan penelitian sebelumnya, Epigallocatechin-3-gallate (EGCG), polifenol utama dalam teh hijau, telah dikenal memiliki antikanker, antibakteri, anti-hiperglikemik, anti-inflamasi, analgesik, antioksidan, antifibrotik, dan peningkatan neovaskularisasi. Efek potensial ini dapat dimanfaatkan untuk meningkatkan viabilitas flap.

Tujuan: Membuktikan injeksi epigallocatechin-3-gallate (EGCG) subkutan dapat meningkatkan viabilitas *extended random skin flap* pada tikus wistar.

Bahan dan Metode: Flap dielevasi pada punggung tikus dengan ukuran 1x4 cm kemudian dikembalikan ke posisi awalnya dan diberi film transparan di bed resipien. Ada 2 kelompok; Masing-masing kelompok terdiri dari 18 subjek. Kelompok 1 sebagai kontrol, tanpa perlakuan. Kelompok 2 diberi injeksi subkutan EGCG 40mg / kg / hari. Pada hari ke 5 dilakukan pengamatan *bleeding point* di 4 cm, 3cm, 2 cm, dan 1 cm dari pedikel. Juga dilakukan pengukuran luas *survival area* flap menggunakan visitrax kemudian pengambilan specimen untuk mengevaluasi jumlah kapiler dan imunohistokimia VEGF di bawah mikroskop.

Hasil: Injeksi subkutan EGCG pada *extended random skin flap* meningkatkan *bleeding point* di area 2 dan 3 cm dari pedikel secara signifikan, meningkatkan persentase luas *survival area* flap, dan peningkatan jumlah kapiler secara histologis di daerah 1 dan 2 cm dari pedikel, dan meningkatkan ekspresi VEGF secara signifikan.

Diskusi: Injeksi EGCG subkutan dapat meningkatkan *bleeding point* artinya meningkatkan blood flow sampe area 3 cm dari pedikel. Juga mempercepat neovaskularisasi sampai area 2 cm dari pedikel dibuktikan dari jumlah kapiler yang lebih banyak dan peningkatan ekspresi VEGF. Dengan peningkatan blood flow dan neovaskularisasi yang lebih cepat dapat meningkatkan viabilitas flap.

Simpulan: Injeksi epigallocatechin-3-gallate (EGCG) subkutan dapat meningkatkan viabilitas *extended random skin flap* pada tikus wistar.

Kata kunci: Epigallocatechin-3-Gallate, *extended random skin flap*, *bleeding point*, *blood flow*, *survival area*, viabilitas flap, neovaskularisasi, kapiler, VEGF, injeksi, subkutan

Effect of Epigallocatechin-3-Gallate (EGCG) Subcutaneous Injection to Increase Viability of Extended Random Skin Flap

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Background: Skin flap is widely used in the field of plastic surgery, but the necrotic flap is also common. Based on the previous studies Epigallocatechin-3-gallate (EGCG), a major polyphenols in green tea, has been known to have anticancer, antibacterial, antihyperglycemic, anti-inflammatory, analgesic, antioxidant, antifibrotic effect, and increase neovascularization. These potential effects can be utilized to improve the viability of the flap.

Objective: To prove EGCG subcutaneous injection can improve the viability of extended random skin flap of wistar rats.

Material and Method: Flap was elevated on the backs of mice with a size of 1x4 cm then it was returned to its original position and given the transparent film on the recipient bed. There are 2 groups; each group consists of 18 subjects. Group 1 as control, without any treatment. Group 2 is given subcutaneous injection of EGCG 40mg / kg / day. On the 5th day, we observed the bleeding point in 4 cm, 3cm, 2 cm, and 1 cm from pedicle. We also measured the size of survival area of the flap with visitrax and collect specimens to evaluate the amount of capillary and VEGF immunohistochemistry under microscope

Result : EGCG subcutaneous injection of extended random skin flap increased bleeding points in the 2 and 3 cm area of the pedicle significantly, increasing the percentage of survival of the flap area significantly, and histologically increasing the capillaries in areas 1 and 2 cm of pedicles significantly, and increasing VEGF expression significantly.

Discussion: Subcutaneous EGCG injection increases the bleeding point meaning it increases the blood flow until 3 cm area from pedicle. It also speeds up neovascularization until 2 cm area from the pedicle as evidenced by the increased amount of capillaries and VEGF expression. Increased blood flow and faster neovascularization can improve flap viability.

Conclusion : EGCG subcutaneous injection can improve the viability of extended random skin flap of wistar rats.

Keywords: Epigallocatechin-3-Gallate, extended random skin flap, bleeding point, blood flow, survival flap, neovascularization, capillary, VEGF, viability