

SUMMARY

RANCANG BANGUN SISTEM LASER GALLIUM ALUMINIUM ARSENIDE UNTUK TERAPI PENYEMBUHAN LUKA PASCA PENCABUTAN GIGI

DESIGN AND CONSTRUCTION
GALLIUM ALUMINIUM ARSENIDE LASER SYSTEM
FOR WOUND HEALING THERAPY AFTER TEETH
EXTRACTION

Created by Perdana, Buyung Prakarsa

Subject : Kedokteran alat dan perlengkapan, Terapi

Keyword : Perancangan sistem laser; performansi; terapi laser

Description :

Laser merupakan berkas gelombang elektromagnetik yang dapat berinteraksi dengan jaringan biologi (biologic tissue). Inilah yang dijadikan sebuah dasar penggunaan laser untuk berbagai macam penyembuhan luka. Oleh karena itu, pada penelitian ini akan dirancang sistem laser semikonduktor GaAlAs yang akan digunakan untuk terapi penyembuhan luka pasca pencabutan gigi pada marmut dengan pengamatan dikhususkan pada pertumbuhan sel fibroblas dan pembuluh darah kapiler. Metodologi penelitian yang dilakukan adalah: pembuatan power supply sebagai instrumen pembangkit laser semikonduktor GaAlAs, mendapatkan performansi laser semikonduktor GaAlAs, membandingkan daya keluaran berkas laser menggunakan fotodetektor dan power meter, dan terapi penyembuhan luka menggunakan laser semikonduktor GaAlAs dengan daya 3 miliwatt selama 15 detik pada kelompok marmut perlakuan. Hasil terapi untuk hari ke 3, ke 7, dan ke 10 pada marmut perlakuan menunjukkan pertambahan jumlah sel fibroblas dan pembuluh darah kapiler yang lebih banyak dibandingkan dengan marmut non perlakuan. Dapat diambil kesimpulan bahwa terapi dengan menggunakan laser semikonduktor GaAlAs dapat mempercepat pertumbuhan sel fibroblas dan pembuluh darah kapiler.

Description Alt:

Laser was the electromagnetic wave beam that could make some interactions with biologic tissue. This reason was made as a basic principle of using laser for wounds healing. Therefore, in this research will be designed a GaAlAs laser system which will be used for therapy on wound healing after teeth extraction to the guinea-pig with observation was set aside in the growth of the fibroblast cell and capillary blood vessels. The methodology of the research was: the made of power

supply as the instrument for generating GaAlAs semiconductor laser, got performances of GaAlAs semiconductor laser, compared the output power of laser beam using photodetector and power meter, and wound healing therapy using the GaAlAs semiconductor laser with 3 miliwatt of power for 15 seconds to the guinea-pig treated sub group.

Results of therapy on the 3rd, 7th, and 10th day for the treated guinea-pig showed the increase in the number of fibroblas cells and capillary blood vessels compared by the non treated guinea-pig. Could be taken by the conclusion that therapy of GaAlAs semiconductor laser could speed up the growth of the fibroblas cell and capillary blood vessels.

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Thank You,

Nur Hasan

