# 人工皮膚之可能材質？論靈芝薄膜對傷口癒合之影響

## A Possible Material for Artificial Skin ? The Effect of

中文摘要

本研究以具有幾丁質成份之松杉靈芝子實體經萃取後之廢渣所製成的薄膜進行實驗。目的在於測試其是否有促進傷口癒合之效果。此靈芝薄膜之化學組成爲 60% 葡萄糖 (glucan)及 40% 乙醯葡萄糖氨 (N-acetyl-D-glucosamine) 的共聚多糖體。 實驗動物爲體重 300-410 克之雌性 Wistar 大白鼠 15 隻；經麻醉後剃毛，於背部雙側進行全皮膚 (Fullthickness) 之切除，切除面積爲 2 x 2 cm2。 分別於一側覆蓋靈芝多孔性膜，另一側則以紗布覆蓋；然後將實驗動物飼養於動物室中。其後每四天觀察傷口之復原情形、記錄傷口面積之大小。並以組織切片方式觀察傷口於術後第四天、第七天和第十六天時組織之增生情況。另外將靈芝多孔性膜及紗布分別植入皮下，於十四天後觀察其和組織間的交互作用。 傷口面積所得之數據結果經 paired Student''s T test 檢定後，顯示覆蓋靈芝薄膜之傷口面積於術後的第四、八、十二、十六、二十天均顯著小於紗布組 ($P<0.05$)。 於組織切片中觀察，靈芝薄膜具有吸引多形性白血球聚集的效果，和紗布組所引起的以巨大性細胞爲主之異物性反應顯著不同。並且靈芝薄膜所覆蓋傷口之組織增生情況較紗布組爲佳。我們結論是靈芝多孔性膜具有促進傷口癒合之效果，可考慮臨床進一步的運用。

英文摘要

Purposes: We use a new Ganoderma membrane, which is made from extracted wasteof fruiting body derived from Ganoderma tsugae, to evaluate the effect of as awound dressing. Chemical analysis revealed the Ganoderma membrane is acopolymer of glucose(60%) and N-acetyl-D-glucosamine(40%). Animals: FemaleWistar rats weighing 300-400g were used. After anesthetized with ketamine andpentobarbital by intraperitoneal injection, dorsal skin hairs were removedwith electric clipper. Two wounds as mirror-image were made on the back bydissecting 2*2 cm2 skins in full thickness. Ganoderma membrane was applied onone wound randomly and gauze was used on the other. These animals were cagedindividually with neck collars, and fed regular rat chow and water ad libitum.The wound areas were measured on the 4th, 8th, 12th, 16th, 20th day afterthese procedures. Histological examinations of wounds

were also performed onthe 4th, 7th, 16th day postoperatively. Implantation of these materials wasdone to reveal the interaction of tissue and dressing. These area data wereanalyzed with paired Student''s T test. Results: The Ganoderma wound areas weresignificant smaller than gauze''s. Histological observation shows Ganodermamembrane induces mild inflammation and attracts polymorphonuclear leukocytes'' aggregation around the margin. These are many macrophages and giant cellsinfiltrating gauze (foreign body reaction). Conclusion: The healing ofGanoderma wound is more smooth than gauze''s. It costs to perform further teststo evaluate the possible clinical application due to the enhanced woundhealing effect of Ganoderma membrane.