

肥皂膜中震波渦流交互作用之可視化研究

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摘要

本論文分為兩個部份第一部份為”肥皂膜中震波渦流交互作用之可視化研究”;第二部份為”體外震波治療對兔子軟骨組織增生之探討”。第一部份的研究,是以低成本的”肥皂膜震波管”進行震波渦流交互作用的可視化研究,實驗方法是利用渦流產生機制與不同濃度之肥皂溶液,在皂膜震波管內產生渦流,並在震波與渦流交互作用時,以傳統單一照片之高速攝影術(Single-Shot High-Speed Flash Photography)來拍攝震波與渦流交互作用時的流場,並進行交互作用現象的可視化分析。第二部份是以動物實驗的方式,來探討體外震波治療儀對兔子軟骨組織修復的情形,研究中以16之紐西蘭白兔作為研究對象,以軟骨下骨鑽洞的方式模擬退化性關節炎,並以左腳為對照組不打震波,右腳為控制組施打震波,在施打震波後第4、8、12、24週犧牲,取其軟骨組織做組織檢查。結果發現,在巨觀檢查中,有施打震波的軟骨比沒施打震波的軟骨明顯較好;但在組織檢查並沒有太大的改變,反而有骨化的現象,值得以後深入探討。

關鍵詞:肥皂膜;震波;渦流;交互作用;體外震波;軟骨;修復

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