骨－髕骨韌帶－骨與骨－前十字韌帶－骨移植之生物力學研究

Biomechanical Study of Bone-Patellar Tendon-Bone and Bone-ACL-Bone Grafts

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摘要

本研究探討骨－髕骨韌帶－骨與骨－前十字韌帶－骨作爲前十字韌帶重建的移植材料的生物力學特性，研究方法以20隻Rottweier狗爲實驗對象，其中18隻爲實驗組，2隻爲控制組，實驗組又區分爲第一組：重建後三個月；第二組：六個月；第三組：十二個月犧牲做拉伸實驗以比較這兩種移植材料的最大抗拉強度。在骨－髕骨韌帶－骨組最大的抗拉強度三個月爲117.1牛頓、六個月爲232.8牛頓、十二個月爲777.4牛頓；在骨－前十字韌帶－骨組最大的抗拉強度三個月爲458.7牛頓、六個月爲814.8牛頓、十二個月爲1064.1牛頓；而控制組前十字韌帶最大抗拉強度爲1461.7牛頓。本研究證實骨－前十字韌帶－骨作爲前十字韌帶的重建材料比骨－髕骨韌帶－骨在生物力學的特性上較佳。

Abstract

Twenty Rottweier dogs were included to investigate the biomechanical behaviors of bone-patellar tendon-bone and bone-ACL-bone grafts for ACL reconstruction. Those dogs were further divided into three experimental groups and one control group. The group Ⅰ was sacrificed three months after ACL reconstruction, the group Ⅱ, six months and the group Ⅲ, twelve months. For bone-patellar tendon-bone graft, the mean maximum tensile strength was 117.1 N in the group Ⅰ, 232.8 N in the group Ⅱ and 777.4 N in the group Ⅲ. For bone-ACL-bone autograft, the mean maximum tensile strength was 458.7 N in the group Ⅰ, 814.4 N in the group Ⅱ and 1064.1 N in the group Ⅲ. The mean maximum tensile strength was 1461.7 N in the control group. This study revealed the bone-ACL-bone graft has a better result than bone-patellar tendon-bone graft for ACL reconstruction in the dog model.