عنوان مقاله:

The Most Appropriate Reconstruction Method Following Giant Cell Tumor Curettage: A Biomechanical Approach

محل انتشار:

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خلاصه مقاله:

Giant cell tumor (GCT) is a primary and benign tumor of bone, albeit locally aggressive in some cases, such as in the epi-metaphyseal region of long bones, predominantly the distal end of femur and proximal end of tibia (1). There are a variety of treatments for a bone affected by GCT, ranging from chemotherapy, radiotherapy, embolization, and cryosurgery, to surgery with the use of chemical or thermal adjuvant (2). Even with advances in new chemotropic drugs, surgery is still the most effective treatment for this kind of tumor (3). The surgery often involves defect reconstruction following tumor removal (4). The aims of treatment are removing the tumor and reconstructing the bone defect in order to decrease the risk of recurrence, and restore limb function, respectively. To achieve these goals, reconstruction is usually accompanied with PMMA bone cement infilling (4). The high heat generated during PMMA polymerization in the body can kill the remaining cancer cells, and hence the chance of recurrence decreases (5). In addition, filling the cavity with bone cement provides immediate stability, enabling patients to return to their daily activities soon (6). The major drawbacks of the technique of curettage and cementation is the high fracture risk, due to the early loading of the bone, and the insufficient fixation of the cement in the cavity (7). Hence, several methods have been developed to fix the bone cement in order to prevent the postoperative fracture. Pattijn et.al packed the cement with a titanium membrane which was attached to the periosteum with small screws (7). The membrane can make early normal functioning of patients possible, since it partially restore the strength and stiffness of the bone. Cement augmentation with internal fixation is another method to decrease the risk of postoperative fractures (6, 8, 9).

کلمات کلیدی:

Giant cell tumor, orthopedic biomechanics, finite element method