

Functional assessment of endoprosthetic knee reconstructions after bone tumor resection

Background

With the help of advanced medical support, limb salvage procedures for patients with bone tumors have become increasingly popular. The importance of gait function as a functional outcome in lower extremity tumor patients has become a crucial component in orthopedic treatment.

Questions/Purposes

We wanted to assess (1) the comparison of functional outcomes in patients according to their original site (distal femur or proximal tibia); (2) the differences in gait function between patients with endoprosthetic knee reconstructions and healthy subjects; (3) the compensations of ipsilateral adjacent joints, and, (4) the pattern of contralateral lower extremity joints.

Methods

We performed functional assessment test as 3D gait analysis and pedobarography for 17 patients who underwent knee endoprosthetic replacement after tumor resection on our center between 2001 and 2012. These patients (nine for distal femur origin, eight for proximal tibia origin) underwent evaluation in laboratory at a mean of 45.8 months after their replacement. During the study period, our indications for this analysis included patients with more than 15 years old, without neurologic musculoskeletal pathology that affected gait function. Also 8 matched healthy subjects were compared with the patients by using Dunnett's test. MSTs and SF-36 were checked to evaluate clinical outcome.

Results

There were no significant outcomes between the patients according to original tumor site. Patients who underwent knee reconstruction after tumor resection were showed decreased walking velocity, ipsilateral step length, and both ground reaction force. Also decreased single support time, maximum ankle joint power and minimal hip joint power at ipsilateral limb showed patients tended to walk slowly to protect themselves rather than compensation. Decreased back and forth ground reaction force, maximal dorsiflexion and minimal ankle joint power at contralateral limb showed protected walking posture.

Conclusions

Decreased gait functions let us know that those patients tended to walk slowly to reduce weight bearing. Patients who underwent tumor prosthesis around knee tended to walk slowly at their preferred life style. But, the further analysis is needed to verify the gait pattern and special care for secondary dysfunction of the patients.

Level of Evidence

Level III, therapeutic study.