Koji Suzuki · Hiroshi Takagi · Masaaki Matsubara · Sadao Morita

Gait analysis in an osteoarthritis patient with restoration of the hip joint space following contralateral total hip arthroplasty: a case report

Received: May 7, 2003 / Accepted: August 5, 2003

Abstract We present the case of a patient who, after undergoing unilateral total hip arthroplasty (THA), achieved pain reduction in the contralateral hip accompanied by restoration of the radiographic joint space. We conducted gait analysis to clarify the dynamic factors affecting the natural course of osteoarthritis (OA). Our findings revealed that the patient walked with exaggerated adduction of the hip following the contralateral THA, causing substantial regeneration of joint loading.

Key words Gait analysis · Recovery · Total hip arthroplasty (THA)

Introduction

We sometimes treat patients with bilateral hip disease who, after undergoing unilateral total hip arthroplasty (THA), achieve pain reduction in the contralateral hip. The factors initiating osteoarthritis (OA) are debatable. Remarkable variability exists between patients and joints in the natural history of the disease. A dramatic spontaneous restoration of the apparent radiographic joint space has been reported in only a few cases involving the hip. In order to understand the biomechanical factors, we conducted a gait analysis of a patient with bilateral hip disease who, after undergoing unilateral THA, achieved pain reduction in the contralateral hip.

Case report

A 57-year-old woman weighing 42 kg presented with a 10-year history of activity-related bilateral hip pain. At the age of 3 years, she had been diagnosed as having developmental dysplasia of both hips, and this had been treated by closed reduction and casting. She had been minimally symptomatic until her early thirties, when initial radiographs showed advanced degenerative joint disease of both hips (Fig. 1). After 3 years of conservative treatment, the patient had undergone THA of the more symptomatic right side (Fig. 2). After recovery she had used a T-cane with her right hand, and during the same period she had noticed a steady diminution of the left hip pain. Serial anteroposterior radiographs had shown that this was accompanied by remodeling of the femoral head into an ellipse, and reformation of the joint space (Fig. 3b).

Fig. 1. Preoperative radiograph in a standing position, showing narrowing of both joint spaces
Throughout the entire course of her disease, the patient’s left hip had shown 10° of flexion contraction. However, the range of flexion gradually increased from 40° at initial presentation to 60° 1 year later. The patient initially had 5° of adduction contraction, but 1 year later this had increased to 10° of abduction and 10° of adduction. During follow-up, the patient took no analgesics. Six months later, her left hip was quite comfortable, and although she continued to have 10° of flexion contraction, she was easily able to achieve 60° of flexion.

In the period before the THA and 1 year after the THA, we conducted gait analysis with a type-9284 Kistler force plate (Kistler Instruments, Winterthur, Switzerland) and a 370 version 1.2 Vicon three-dimensional motion analysis system (Oxford Metrics, Oxford, UK), including five infra-red video cameras. The hip adduction angle and abduction moment during the gait cycle increased after contralateral THA (Fig. 4).

Discussion

We sometimes treat patients with bilateral hip disease who, after undergoing unilateral THA, achieve pain reduction in...