

# GENU RECURVATUM AS A COMPLICATION AFTER TOTAL KNEE ARTHROPLASTY

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**SUMMARY** – A 73-year-old female patient underwent total knee arthroplasty for arthrosis. After surgery, recurvatum instability over 55° occurred. Two years later, primary endoprosthesis was removed and a revision endoprosthesis implanted. However, complete deformity occurred again. Two years later, the thickest revision polyethylene tibial implant was implanted on the same endoprosthesis. In spite of using knee orthosis, recurvatum deformity returned. Seven months later, new revision rotating hinge prosthesis was implanted. This procedure seems to have solved the problem. The knee deformity in this specific case was larger than the deformity in cases reported so far, and it was solved after three surgical procedures. Rotating hinge prosthesis seems to be the method of choice for immediate repair of recurvatum instability after total knee arthroplasty.

**Key words:** *Knee alloarthroplasty, complications; Genu recurvatum*

## Introduction

Besides deep venous thrombosis and infection<sup>1,2</sup>, the complications following knee endoprosthesis implantation include instability of the knee, although it is quite rare. It is manifested as flexion-extension instability, genu recurvatum and global instability<sup>3,4</sup>. This rare complication and surgical methods of its treatment are scarce<sup>5-8</sup>.

## Case Report

A 73-year-old woman was implanted total cement knee endoprosthesis in 2005 at another medical institution (Fig. 1a-b). As soon as she started standing and walking, the knee was distorted backwards, and finally she was confined to a wheelchair. She was referred to our department in December 2007 with severe recurvatum deformity, over 55° under loading (Fig. 2). Col-

lateral ligaments were quite strong, and there was no posterior instability. The patient underwent surgical procedure and total revision endoprosthesis was implanted (Nex Gen Complete Knee Solution, Zimmer, Warsaw, USA). In the early postoperative period, the axis of the leg was satisfactory in LL projection, but as soon as she started walking the recurvatum returned,



*Fig. 1a-b. AP and LL x-rays of the left knee after total knee arthroplasty.*

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*Fig. 2. Recurvatum of the knee after total knee arthroplasty.*

in two months reaching the same extent as before the surgery (Fig. 3a-b). In April 2010, we implanted

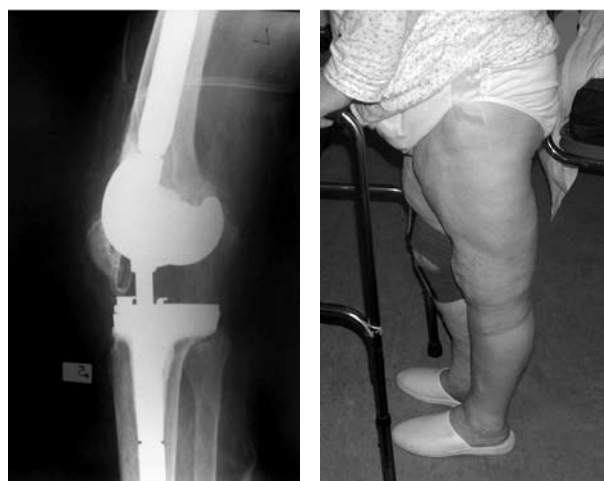


*Fig. 3a-b. One month after revision total knee arthroplasty, recurvatum of the knee occurred in the same way as before the operation.*

the thickest possible polyethylene tibial implant (23 mm) on the same previously implanted revision endoprosthesis. After the operation, the patient used a knee orthosis for 6 weeks, which prevented full extension. However, the recurvatum developed again and reached the same extent as before the first surgery. In December 2010, we implanted a new revision endoprosthesis (NexGen, Complete Knee Solution, Rotating Hinge Knee, Zimmer, Warsaw, USA). The early postoperative x-rays (Fig. 4 a-b) were satisfactory, and the recurvatum did not recur after full return to normal ambulation.

### Discussion

Pathologic recurvatum of the knee is rare. Among the patients implanted a knee endoprosthesis, less than 1% of them had recurvatum before the surgery and if the neuromuscular disease is present, recurvatum usually disappears after knee endoprosthesis implantation<sup>7</sup>. However, even though it occurs rarely, recurvatum knee deformity can occur in patients who did not have the recurvatum prior to the surgery, as a complication after endoprosthesis implantation<sup>6-8</sup>. Prior to the surgery, our patient had neither recurvatum nor neuromuscular disease. She had knee arthrosis with mild flexion contracture. After making the first step, her knee would “move” backwards into recurvatum. In supine position, the recurvatum was somewhere around 40°, which increased to over 55° in



*Fig. 4a-b. After implanting the rotating hinge knee endoprosthesis, recurvatum disappeared.*

standing position. The patient was not able to walk. Collateral ligaments were quite tense, but during varus and valgus stress test, it was possible to "open" the knee joint for a few millimeters, indicating that the polyethylene tibial implant should have been a few millimeters thicker. X-rays showed good leg axis in AP projection, and in LL projection it seemed that tibial plateau was cut under appropriate angle. Bone fragments were visible behind the femur condyle (Fig. 1b). During the surgery, we found stable collateral ligaments, with delicate looseness of a few millimeters. After removal of primary endoprosthesis, we noticed the tissue towards the back-knee pitch to be distorted towards the joint space. Revision endoprosthesis was implanted. Collateral ligaments were strained. However, just after the patient started walking, the recurvatum reappeared to 20°, and a month later it reached the previous extent (Fig. 3). Reoperation was proposed and the thickest polyethylene tibial implant (23 mm) was implanted. It was expected to solve the problem, if the orthosis was used in the mild flexion posture. However, a month and a half after this surgery and after using the orthosis, the knee position deteriorated again and the finding was the same as before the surgery. Now, we decided to implant the hinge rotating model. Cases described so far<sup>7,8</sup> had a smaller recurvatum degree (10–45°) than our patient (over 55°). Taking into consideration that our patient is obese, we hope that partial mechanical loosening or damaging of the endoprosthesis will not happen. The early postoperative stage shows good position of the knee in extension without recurvatum. LL projection x-ray looks good, without recurvatum.

We were not able to explain how it was possible to damage the posterior joint capsule to such an extent during the first operation that it caused so drastic and recurring complications that disabled the patient. The experience with this case indicates that implantation of the hinge rotating model could be the method of choice for immediate repair of any recurvatum developing after primary implantation of knee endoprosthesis, thus avoiding further complications and unnecessary surgeries.

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## Sažetak

## REKURVATUM KOLJENA KAO KOMPLIKACIJA TOTALNE ENDOPROTEZE KOLJENA

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U radu se prikazuje 73-godišnja bolesnica kojoj je ugrađena totalna endoproteza koljena zbog artroze. Nakon operacije nastao je recurvatum deformitet od preko 55°. Dvije godine kasnije odstranjena je primarna i ugrađena revizijska endoproteza koljena. Međutim, deformitet se je ponovno pojavio. Dvije godine kasnije na istu je endoprotezu ugrađen najdeblji polietilenski umetak. Unatoč nošenju koljenske ortoze recurvatum koljena se je ponovno pojavio. Sedam mjeseci kasnije ugrađena je nova revizijska *rotating hinge* endoproteza. Izgleda da je ovom operacijom riješen problem recurvatuma. Deformitet je u ove bolesnice bio jači od drugih objavljenih slučajeva, a riješen je nakon tri operacijska zahvata. Izgleda da je *rotating hinge* endoproteza trebala biti metoda izbora odmah nakon pojave recurvatuma deformiteta.

Ključne riječi: *Endoproteza koljena, komplikacije; Recurvatum koljena*