

**BILATERAL TOTAL HIP AND KNEE ARTHROPLASTY IN A PATIENT WITH RHEUMATOID ARTHRITIS. A CASE REPORT**

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Rheumatoid arthritis (RA) is a chronic, inflammatory autoimmune disorder of unknown etiology characterized by synovial hyperplasia and resulting joint destruction. Despite reduced needs for total joint arthroplasty in the treatment of end-stage damage of the hip and knee in RA, many patients still require hip and knee arthroplasty to restore the hip function and quality of life.

We present the surgical treatment of young RA patient with bilateral total hip and bilateral knee arthroplasty at the Clinic of Orthopaedics and Traumatology Clinical Center Niš. Male patient with seropositive RA was implanted with bilateral total hip and knee over a period of 4 years (2008 to 2011). At the time of the first left hip arthroplasty, the patient was 32 years old. Surgical treatment in all arthroplasty procedures passed without complications. At the control examination 3 years after the last surgery, the patient was walking without mobility aids. His walk was safe and stable. The post-operative scars on hips and knees were stable, with no signs of inflammation. The flexion of the knees was possible till 110 degrees, and the extension to the full capacity. The patient resumed his work and life activities, and now he works as a game warden. He normally performs everyday activities, including climbing to the watchtower.

Total hip and knee arthroplasty in rheumatoid arthritis patients with advanced joint destruction is a successful solution. *Acta Medica Medianae 2014;53(4):30-36.*

**Key words:** *rheumatoid arthritis, bilateral arthroplasty, hip, knee*

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**Introduction**

Rheumatoid arthritis (RA) is a chronic, inflammatory autoimmune disorder of unknown etiology characterized by synovial hyperplasia and resulting joint destruction (1).

Treatment of RA is specific, and depends on the stage of disease, subjective and objective complications, and can be medication, functional and operative (2). The medical treatment of RA has improved during the past 25 year, which decreased the rate of hip and knee surgery (3).

Despite the reduction in the need for total joint arthroplasty in the treatment of end-stage damage of the hip and knee in RA, many patients

still require hip and knee arthroplasty to restore the hip function and quality of life (4,5).

RA is the third most common indication for the hip and knee arthroplasty in Northern Europe and North America (6).

Seventeen percent of patients with RA undergo orthopaedic surgery within 5 years from the initial diagnosis and over one third of patients will need total hip or knee arthroplasty (3,7).

The aim of study was to present the surgical treatment of young RA patient with bilateral total hip and bilateral knee arthroplasty at the Clinic of Orthopaedics and Traumatology, Clinical Center Niš.

**Case report**

A 25-year-old patient was hospitalized in the Institute for Rheumatology in Belgrade, on December 12<sup>th</sup>, 1999, because of the pain and swelling of the knee, foot, right elbow which was in contracture, and because of the morning stiffness in peripheral ankles, in duration of one to two hours. The patient claimed that he got ill 5 years before, during the service in the army. He had pain in both feet, which lasted for 10-15 days. After

the application of non-steroidal anti-inflammatory drugs, the discomfort disappeared.

Two years later, he got pains and swelling in both knees, and morning paralysis in the peripheral ankles. Since then, both of his knees were punctuated several times. During the last year he had the swelling of the right elbow, which was in contracture. During the last few months he was also complaining of the pain in the groins, which intensified in the left groin during walking. He was treated several times by orthopedists, and occasionally was treated with corticosteroids. Since the childhood he had been complaining of the irritation in the eyes, and periodical irritation while urinating.

In the personal anamnesis, he claimed that he could not apply for the Military Academy because of the high blood pressure, which was not treated. He had the appendix surgery and the tonsil surgery, too.

Objective findings on admission: clinical examination was normal, except for the hypertension TA 155/105mmHg.

The signs of arthritis of both knees and hydrops of the right knee were found after the rheumatologist's examination. The contracture of the right elbow and the arthritis of the MTP ankles of the feet were present, too. The x-rays of the feet and pelvis showed clear signs of RA.

Lab analysis: SE-49, HB-11. 2, Le-10.8, TR-434, SGOT-17.9, SGPT-14.0, Glik.-5.15, Fibr.-5.0, Fibr. 5.0, Creatinin 80, Urine b.o., RW +1/40, Latex +1/320.

The synovial liquid was slightly blurry in the puncture, L-10.0, ragoc +, crystals O, segm. 90, RW+1/80, Latex+1/640.

According to the anamnesis, clinical, radiological and lab results, it was concluded that the diagnosis was seropositive rheumatoid arthritis. The following therapy was prescribed: Drg. Diclofenak a 100mg 1x1, Sulfasalasin a 500mg 2x2, Prinorm 1x0.5 tbl., during the following 15 days. He was advised to continue with exercise, and the control was scheduled in two months in this institution.

Because of the persistent pain and the limitation of movements of the hip joints, the patient was hospitalized at the Clinic of Orthopedics and Traumatology in Niš, on November 24<sup>th</sup>, 2008, because of the implantation of total prosthesis of the left hip (Figure 1.).

Because of the high values of urea and cretin, the nephrologist was consulted, who further required the kidney ultrasound, and prescribed the therapy. The total cementless prosthesis of the left hip was implanted under general endotracheal anesthesia. Postoperative X-ray showed good orientation of the prosthesis (Figure 2.).

The early postoperative recovery passed normally. The patient was capable of walking with underarm crutches with false weight-bearing on the operated leg. The patient was discharged from hospital, with the recommendation



Figure 1. X-ray of the hips of the patient with rheumatoid arthritis before surgery

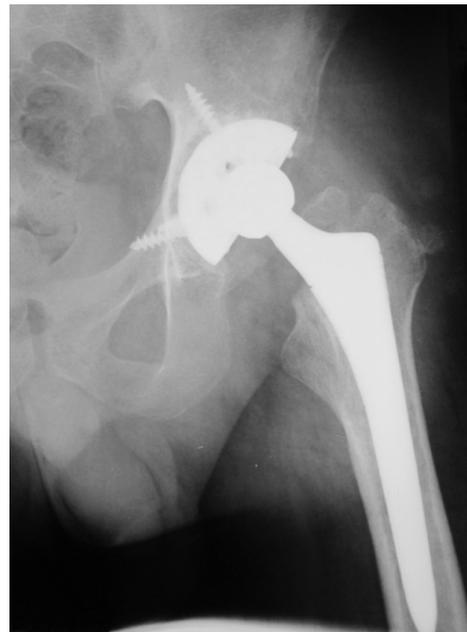


Figure 2. X-ray of the left hip after total hip replacement (cementless prosthesis)



Figure 3. X-ray of the pelvis after bilateral total hip replacement



Figure 4. Anteroposterior view and lateral X-ray after bilateral total knee replacement

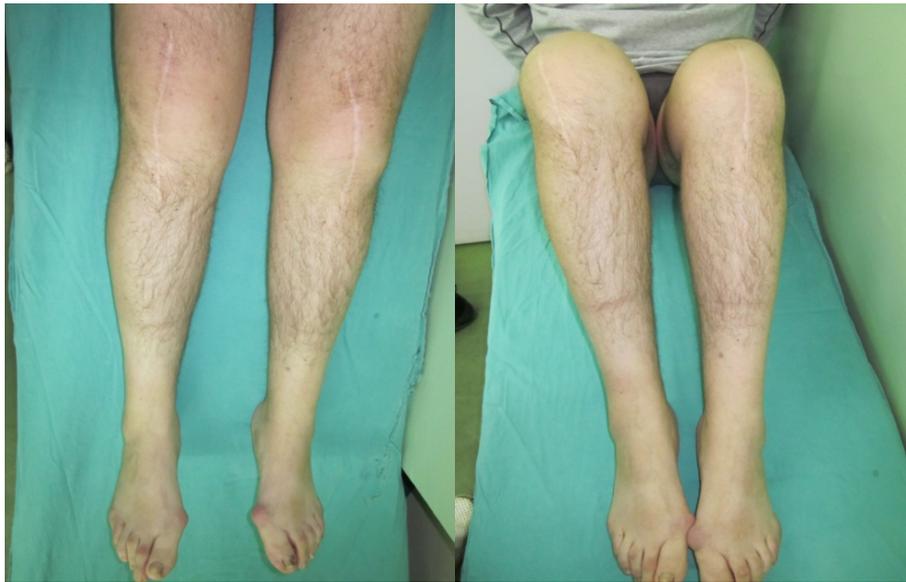


Figure 5. Control examination 3 years after the last surgery

to conduct the physical treatment in the competent institution.

Because of permanent pain and limitation of movements in the right hip, the patient was hospitalized at the Clinic of Orthopedics and Traumatology in Niš, on July 7<sup>th</sup>, 2009, due to the implantation of total prosthesis of the right hip.

The total cementless prosthesis of the left hip, type Stryker, was implanted under general endotracheal anesthesia. The operative and the postoperative recovery passed normally. The wound was in the phase of healing. The stitches were not removed. Control x-ray showed good orientation of the prosthesis components (Figure 3.).

The early postoperative recovery passed normally. The patient was capable of walking with underarm crutches with false weight-bearing on the operated leg. The patient was discharged from

hospital, with antiplatelet and analgesic therapy. The hospital physical therapy was recommended.

Because of the chronic pain and limitation of movements in the left knee, the patient was hospitalized at the Clinic of Orthopedics and Traumatology in Niš on May 11<sup>th</sup>, 2010 due to the implantation of total prosthesis of the left knee.

The total cemented prosthesis of the left knee was implanted under the spinal anesthesia. The wound was in the phase of healing, stitches were not removed. Control x-rayed showed good orientation of the prosthesis.

The patient was discharged from the hospital with the recommendation to receive the physical treatment at the Clinic for Physical Therapy of the Clinical Center Niš. The antiplatelet and the analgesic therapies were applied. He was allowed to walk, with full weight-bearing on the operated leg.

The patient was hospitalized at the Clinic for Physical Therapy of the Clinical Center Niš on June 6<sup>th</sup>, 2010, because of the difficulty walking and limited movements of the left knee after the operation. After hospitalization, the patient was able to walk independently with forearm crutches with weight-bearing on the operated leg. In the area of left tibia, the postoperative scar had no signs of inflammation. There was the contracture of the left knee, the flexion was possible to 70 degrees, and the extension was possible almost to the full capacity. The mobility of the left hip and the left ankle joint was limited to the medium level. The GMS of left extremities was weakened. During the hospitalization, kinesi-, hydro-, work, electro- and magnetic therapy were applied. Medication therapy was continued with: Tbl. Prinorm 2x1/2, tbl. Salazopyn 500 2x2, tbl. Folan 2x1 (once a week), Metotrexat 2.5 2x2 (once a week), Diklofenak duo 1x1. At the discharge, the patient was able to walk with the help of crutches, with full weight-bearing. Walking was possible at flat terrains, and also up the stairs. The mobility of the left knee increased; flexion was possible up to 90 degrees. The total muscle power of the left leg was increased.

Because of the chronic pain and limitation of movements in the right knee, the patient was hospitalized at the Orthopedics Clinic in Niš on May 25<sup>th</sup>, 2011, due to the implantation of total prosthesis of the right knee.

The total cemented prosthesis of the right knee was done under spinal anesthesia. The postoperative recovery passed normally. The wound was in the phase of healing, stitches were not removed. Control X-rays showed good orientation of the prosthesis (Figure 4).

The patient was activated with underarm crutches. The antiplatelet as well as analgesic therapy were prescribed. For the purposes of the continuation of treatment, the patient was transferred to the Clinic for Physical Therapy of the Clinical Center Niš.

The patient was hospitalized at the Clinic for Physical Therapy of the Clinical Center Niš on February 2<sup>nd</sup>, 2011, after the implementation of endoprosthesis of the right knee.

On admission, the patient was active using the forearm crutches, with weight-bearing on the operated leg. The contracture of right knee was present, flexion was possible to 60 degrees, and extension was possible almost to the full capacity. The mobility of hips was limited to the medium level. The GMS of lower extremities was weakened. During hospitalization, kinesi-, hydro -, work, electro- and magnetic therapy were applied. Medication therapy was also continued. At the discharge, the patient was able to walk on his own, with the help of crutches, with full weight-bearing. Walking was possible over flat terrains, and also up the stairs. The mobility of the right knee increased; the flexion was possible to 90 degrees. The total muscle power of the right leg also increased.

At the control examination done on January 21<sup>st</sup> 2014, the patient was walking without aids. His walk was safe and stable. The postoperative scars on hips and knees were stable, with no signs of inflammation. The flexion of the knees was possible up to 110 degrees, and extension was possible to the full capacity (Figure 5.).

The patient returned to his work and life activities, and now he works as a game warden (Figure 6.). He normally performs everyday activities, including climbing to the watchtower.



Figure 6. After four operations, the patient resumed his work and life activities

## Discussion

RA is generally treated by medications, including nonsteroidal anti-inflammatory drugs (NSAIDs), glucocorticoids and disease-modifying antirheumatic medications.

Many patients with RA still require total hip and knee arthroplasty in the management of end-stage damage of the hip and knee (3).

NSAIDs can be associated with increased bleeding risk and therapy should be discontinued one week prior to surgery (8).

Chronic use of glucocorticoids leads to poor bone quality, weakening of the immune system and impaired wound healing (9).

Patients with RA are two times more likely to develop postoperative infection after total hip and knee replacement (10). Bongartz et al. in their study concluded that patients with RA 5 year after primary total knee replacement had 3 times more infections than patients with osteoarthritis (4.2% compared to 1.4%) (11). Somayaji et al. in their study found that the use of corticosteroids increased the risk of postoperative infection in RA patients undergoing large joint arthroplasty espe-

cially at doses over 15mg/day (12).

Surgical wound healing is also a major problem for patients with RA after total hip and knee arthroplasty (9). Many drugs used in the treatment of rheumatoid arthritis (corticosteroids, methotrexate, TNF- $\alpha$  inhibitor) reduce the wound healing. The British Society of Rheumatology advises that medication treatment may be restarted post-operatively if there is no evidence of infection and wound healing is satisfactory (13). Because of the problem of wound healing in patients with RA, perfect sterile operative technique, careful intra-operative skin and subcutaneous tissue handling and tight closure of operative wound are essential.

The risk of deep vein thrombosis in patients with RA undergoing hip or knee surgery is 3 to 10 times lower than in patients with osteoarthritis (14).

There are technical operative challenges during the total hip and knee arthroplasty in patients with RA which are not present in patients with osteoarthritis. Patients with RA have poor bone and soft tissue quality.

Main technical problems during total hip arthroplasty in patients with RA are bone loss, osteopenia and acetabular protrusion. Controversies still exist which type of prosthesis should be used in patients with RA (cemented or uncemented).

Ejnisman et al. in their study compared the use of uncemented implants in total hip arthroplasty in patients with RA and osteoarthritis. Their results are as follows: no difference was found in osseointegration rates (both femoral and acetabular components) in both groups; the rates of revision surgery and survival of prostheses also did not show significant differences (15).

Finnish arthroplasty register (analysis of 2,557 primary total hip replacement using various type of hip prosthesis in patients with RA) shows the best survival with uncemented proximally circumferentially porous-coated stems (89% survival at 15 years) and cemented all-polyethylene cups (80% survival at 15 years) (16).

Norwegian arthroplasty register found that cemented total hip arthroplasty was superior to uncemented (with 10 year survival, 89% versus 81%) in patients with RA (6).

Acetabular protrusion and medial wall deficiency are common problems in the rheumatoid

hip surgery. Hirst described the Wrightington technique for bone grafting of acetabular floor using 2 mm discs cut from the femoral head (17). Greater protrusion may require additional bone grafting and use of cage.

Poor bone quality, avascular necrosis, deformity and contracture are the main technical problems during knee arthroplasty in patients with RA. Implant augmentation and bone grafting are often necessary (6).

Small bone cysts during knee arthroplasty in RA patients can be filled during cementation. Large bone cysts require filling with autologous graft from the bone cuts or allograft from morselized femoral head (9).

In RA patients, bone cuts have to be performed according to the anatomy and implant design, and appropriate ligament balancing is required. Very often, more bone cuts are needed to get the knee straight during operation in RA patients with severe flexion contracture (18). Incomplete intraoperative correction of severe flexion deformity leads to more residual flexion contracture postoperatively (19).

The use of a cruciate retaining (CR) versus a posterior-stabilized (PS) prosthesis in knee arthroplasty in RA patients is still controversial. Laskin et al. (178 RA patients and 8.2 year follow up) found a 50% instability rate with PCL retaining implants versus 1% instability rate with the PS prosthesis (20).

Cemented total knee prosthesis may be the preferred option in poor bone stock in patients with RA (6).

Shoji et al. (retrospective comparison study) found no difference in pain or functional outcome in RA patients undergoing total knee arthroplasty with and without patella resurfacing (21).

Total hip and knee arthroplasty in rheumatoid arthritis patients with advanced joint destruction are successful solution. This is confirmed by many long-term follow-up studies.

#### Acknowledgement

This paper is part of the project III 41017 Virtual human osteoarticular system and its application in preclinical and clinical practice, funded by the ministry of Education and Science of Republic of Serbia.

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## **OBOSTRANA ARTROPLASTIKA KUKA I KOLENA KOD PACIJENTA SA REUMATOIDNIM ARTRITISOM. PRIKAZ BOLESNIKA**

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Reumatoidni artritis (RA) je hronični, inflamatorni autoimuni poremećaj nepoznate etiologije koji se karakteriše sinovijalnom hiperplazijom i dovodi do razaranja zglobova. Uprkos smanjenju potrebe za artroplastikom velikih zglobova u lečenju teškog oštećenja zglobova kod RA, mnogi pacijenti i dalje zahtevaju ovu vrstu operacije, kako bi povratili funkciju zglobova i kvalitet života.

U radu se prikazuje hirurško lečenje pacijenta sa reumatoidnim artritisom na Klinici za ortopediju i traumatologiju Kliničkog centra Niš kod koga su implantirane obostrane totalne endoproteze kuka i kolena. Pacijentu muškog pola sa seropozitivnim RA implantirane su obostrane totalne endoproteze kuka i kolena u periodu od četiri godine (od 2008. do 2011.). U vremenu prve operacije artroplastike levog kuka pacijent je imao 32 godine. Hirurško lečenje tokom svih operacija implantacija endoproteza prošlo je bez komplikacija. Na kontrolnom pregledu, tri godine od poslednje operacije, pacijent normalno i stabilno hoda bez pomagala. Operativni ožiljci mirni. Fleksija oba kolena je moguća do 110 stepeni, a ekstenzija potpuna. Pacijent se vratio svojim životnim i radnim aktivnostima. Radi kao lovočuvnik i bez problema se penje na osmatračnicu.

Tatalna artroplastika kuka i kolena kod pacijenata sa reumatoidnim artritisom kod kojih postoji značajno oštećenje velikih zglobova predstavlja uspešno rešenje. *Acta Medica Medianae 2014;53(4):30-36.*

**Ključne reči:** reumatoidni artritis, bilateralna artroplastika, kuk, koleno