EARLY EXPERIENCE WITH TARIC TOTAL ANKLE ARTHROPLASTY, UBTALAR FUSION, AND MODIFIED BROSTROM IN PATIENTS WITH RHEUMATOID ARTHRITIS

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ABSTRACT

Rheumatoid arthritis (RA), a chronic inflammatory disease, primarily affects synovial joints, leading to progressive joint damage, pain, and physical limitations. (1) RA frequently involves the feet and ankles, where synovitis results in pain, stiffness, and joint destruction, often altering foot mechanics and heightening fall risk, thereby diminishing quality of life. (2) Although clinical exams help in identifying synovitis, their accuracy in RA assessment can be limited.(1) Historically, end-stage rheumatoid ankle arthritis has been managed with ankle arthrodesis to achieve pain relief and joint stability. (2) However, Total Ankle Arthroplasty (TAA) offers a promising alternative by preserving ankle motion and potentially mitigating osteoarthritis in adjacent joints.(3) This case report details a 57-year-old female with right ankle osteoarthritis due to RA, diagnosed eight years prior via rheumatoid factor positivity, successfully managed with a combined approach of TAA, subtalar fusion, and a modified Brostrom-Gould (BG) repair to enhance function and alleviate pain.

Keywords*: Total Ankle Replacement; Subtalar Arthrodesis; Modified Brostrom; Rheumatoid Arthritis*

INTRODUCTION

Rheumatoid arthritis (RA) is a systemic, chronic, autoimmune, and polyarticular disease that causes inflammation primarily affecting the synovial joints, with progressive degeneration and erosion of cartilage, leading to pain and functional limitations[2,4]. An ankle joint arthrodesis has historically been the gold standard therapy for end-stage rheumatoid ankle arthritis since RA is a typical inflammatory arthritis that may be connected to the high prevalence of postoperative problems.[2,5,6] Total ankle arthroplasty (TAA) is becoming more popular as a treatment for end-stage ankle arthritis because to its biomechanical brilliance and improve clinical outcomes[3,5,7].

Here, we present our first experience of TAR Associated with Subtalar Arthrodesis and Modified Brostrom Procedures of a Female with Osteoarthritis Ankle et cause Rheumatoid Arthritis in Indonesia.

CASE DESCRIPTION

A 57-year-old female sought consult due to a right ankle pain for 2 years and had gotten worse in the last 6 months. The patient had a history of Rheumatoid Arthritis since she was young but was only diagnosed 8 years ago, so far the patient consume NSAID to relief her right ankle pain.

Examination showed swelling in the lateral and medial malleoli of right ankle, pain in movement for internal rotation Ankle X-Ray showed Subtalar osteoarthritis.

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Figure 1. Clinical picture of the ankle patient's seen in 3 positions, swollen in the right ankle (a) Anterior view, (b) Posterior view, (c) Medial View.

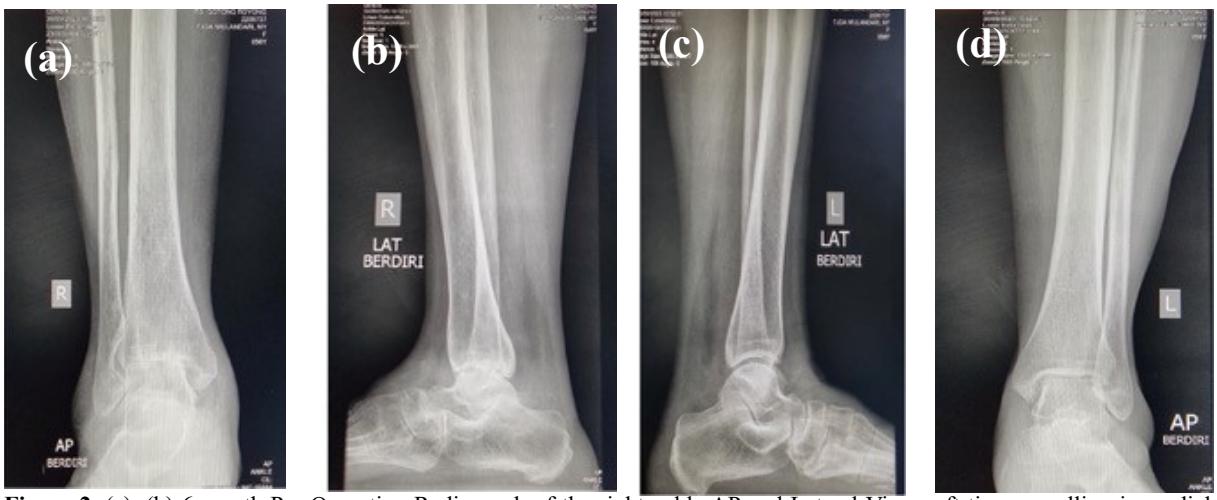

Figure 2. (a), (b) 6 month Pre Operation Radiograph of the right ankle AP and Lateral View soft tissue swelling in medial and lateral ankle joint, Irregularity of the articular facies with the formation of pseudocysts accompanied by narrowing of the talocrural articularis cavity Osteoarthritis talocruralis. (c), (d) Radiograph of the left ankle AP and Lateral View There is soft tissue swelling lateral to the joint, there were no visible abnormalities in the articular facies, articular cavity and bones.

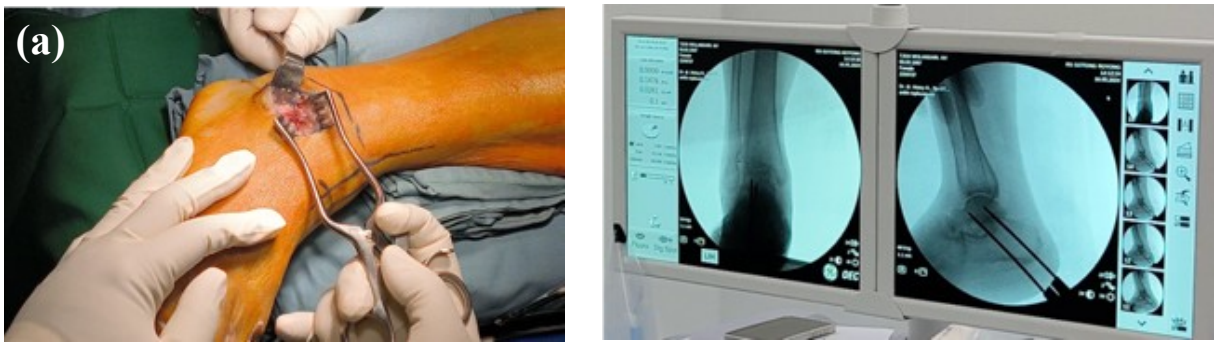

Figure 3. Subtalar arthrodesis with sinus tarsi Approach (a) Gross appearance of right ankle preparation for arthrodesis, (b) C arm view Subtalar Arthrodesis of the right ankle.

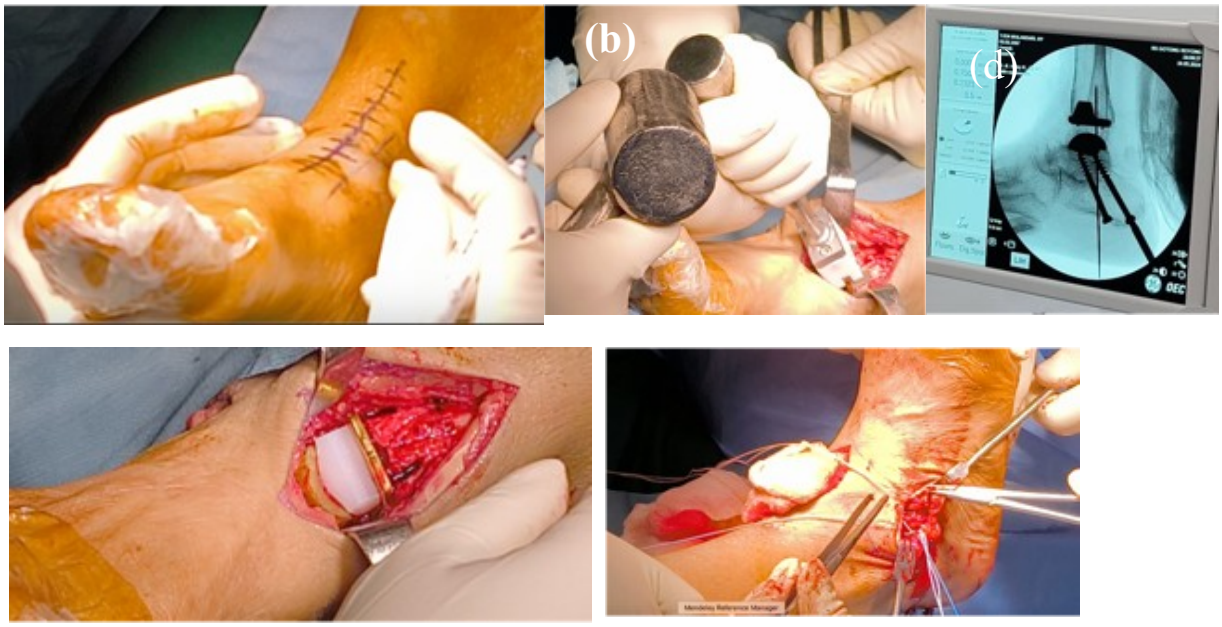

Figure 4. (a),(b),(c) Total Ankle Arthroplasty anterior Approach. (d) C arm view after insert PE Implant. (e) modified brostrom to decrease lateral instability.

Figure 5 (a),(b),(c) 3 weeks post Operation (a),(b) clinical picture seen in 2 position, (c),(d) AP, Lateral view radiograph of the right , (e) 4th months Postoperative clinical picture.

Total Ankle Prosthesis with Subtalar Fusion Modified Brostrom-Gould (BG) repair was chosen because the patient was experiencing end stage ankle arthritis so total ankle prosthesis was chosen, subtalar arthrodesis became the treatment choice because there was OA in the subtalar joint area, after total ankle prosthesis lateral instability occurred so modified Brostrom-Gould (BG) repair became an option to reduce lateral instability.

DISCUSSION

Rheumatoid arthritis (RA) in the subtalar joint is less common compared to other joints with synovial fluid. Nevertheless, the gradual deterioration of this joint can lead to flatfoot due to a combination of factors, including joint capsule damage, ligament deterioration, and increased pronation forces. In patients with RA and ankle osteoarthritis, traditional treatments such as ankle arthrodesis are often employed. However, Total Ankle Arthroplasty (TAA) is gaining popularity due

to its ability to preserve ankle motion and prevent osteoarthritis in adjacent joints.[6,8]

The occurrence of rheumatoid arthritis in the subtalar joint is less common compared to other joints with synovial fluid. Nevertheless, the gradual deterioration in this joint can result in flatfoot due to a combined impact that includes the deterioration of the joint capsule, ligaments, and increased pronation forces.[2,8]

This report discusses a 57-year-old female patient with rheumatoid arthritis who presented with right ankle osteoarthritis. The patient underwent Total Ankle Arthroplasty (TAA) using the TARIC implant, combined with subtalar fusion to address subtalar arthritis, and a modified Brostrom-Gould (BG) repair to manage lateral instability.

Surgical Procedure Details:

1. Ankle Arthroplasty (TAA): The procedure began with an anterior ankle incision, mobilizing the tibialis anterior tendon to expose the tibiotalar joint. The damaged articular cartilage from the osteoarthritic joint was removed, and the bone was prepared to accommodate the implant, using a specially designed jig. The TARIC implant was inserted with careful attention to anatomical alignment to ensure optimal load distribution and preserved ankle mobility.
2. Subtalar Arthrodesis: After the ankle implant was secured, the focus shifted to the subtalar joint. The subtalar joint was exposed, and the degenerated cartilage was removed. The talus and calcaneus were prepared for fusion. Cannulated screws were used for fixation, ensuring adequate compression and proper fusion. The alignment of the foot was carefully checked to prevent further flatfoot deformity.
3. Lateral ligament reconstruction with Brostrom-Gould (BG) repair is an effective procedure for the treatment of lateral ankle instability during total ankle replacement procedure. Secure fixation with suture anchors enables early rehabilitation and immediate protected full weightbearing, without compromise of clinical outcomes. Comparing with ATLAS (Anatomic Lateral Ankle Stabilization) at short-term follow-up, anatomic reconstruction produced better outcomes than the traditional BG procedure. Additional comparative studies between techniques to address instability in the TAA population are warranted.
4. Closure and Recovery: Once the procedures were completed, the wound was closed in layers with drains placed to reduce fluid buildup. The patient was placed in a posterior splint for immobilization and allowed limited weight-bearing immediately postoperatively, following the rehabilitation protocol.

Subtalar arthrodesis is frequently utilized in the management of posttraumatic subtalar arthritis, rheumatoid arthritis, posterior tibial tendon dysfunction, tarsal coalition, and primary subtalar arthritis, with reported fusion rates between 84% and 100%. Multiple studies have indicated that fusion is often necessary due to the progression of subtalar arthritis following ipsilateral tibiotalar arthrodesis.[9]

Studies directly comparing TAA with AA have reported a variety of outcome measures Seven studies comparing two treatments examined gait analysis. General findings include improved walking ability upstairs, downstairs, and on uneven surfaces. Specifically, patients using TAA had a more balanced gait than patients using AA.[9]

Lateral ligament reconstruction with ATFL and CFL advancement is an effective procedure for the treatment of chronic lat- eral ankle instability. Secure fixation with suture anchors enables early rehabilitation and immediate protected full weightbearing, without compromise of clinical outcomes.[9]

This combined approach presents a promising alternative to total arthrodesis for patients with RA and ankle osteoarthritis. In this case, the patient showed significant improvements in joint function, with better walking ability and improved control on uneven surfaces. The use of TARIC TAA allowed the preservation of essential joint motion, while subtalar fusion prevented further progression of subtalar arthritis. The modified Brostrom-Gould (BG) repair ensured adequate lateral stability, allowing for early rehabilitation and optimal outcomes.[10]

Traditional treatment for end-stage rheumatoid ankle arthritis has been ankle joint arthrodesis, but total ankle arthroplasty (TAA) is gaining favor due to its potential to preserve ankle motion and prevent osteoarthritis in adjacent joints. Surgeons should remember that TAA is not for every patient and that the appropriate indication, based on the evidence available, is fundamental to obtaining durable and predictable outcomes. A thorough knowledge of ankle anatomy, pathologic anatomy and biomechanics together with a careful preoperative planning are mandatory to successful technical performance of total ankle replacement surgery. This case study reports on a 57-year-old female with RA presenting with right ankle osteoarthritis, managed using TAR combined with subtalar arthrodesis and a modified Brostrom-Gould (BG) repair to address lateral instability. This approach demonstrates an alternative to arthrodesis, offering pain relief, improved joint function, and enhanced clinical outcomes.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

REFERENCES

1. Enache L, Popescu CC, Micu MC, Cojocaru A, Șuța VC, Șuța M, et al. Ankle involvement in rheumatoid arthritis – A comparison of inflammatory signs on musculoskeletal ultrasound and magnetic resonance imaging. Med Ultrason. 2019;21(3):265–72.
2. Cho BK, An MY, Ahn BH. Comparison of Clinical Outcomes After Total Ankle Arthroplasty Between End-Stage Osteoarthritis and Rheumatoid Arthritis. Foot Ankle Int. 2021 May 1;42(5):589–97.
3. Alsayel F, Alttahir M, Mosca M, Barg A, Herrera-pérez M, Valderrabano V. Mobile anatomical total ankle arthroplasty—improvement of talus recentralization. J Clin Med. 2021 Feb 1;10(3):1–12.
4. Ortega-Avila AB, Moreno-Velasco A, Cervera-Garvi P, Martinez-Rico M, Chicharro-Luna E, Gijon-Noqueron G. Surgical treatment for the ankle and foot in patients with rheumatoid arthritis: A systematic review. Vol. 9, Journal of Clinical Medicine. MDPI; 2020.
5. Lawton CD, Butler BA, Dekker RG, Prescott A, Kadakia AR. Total ankle arthroplasty versus ankle arthrodesis-a comparison of outcomes over the last decade. Vol. 12, Journal of Orthopaedic Surgery and Research. BioMed Central Ltd.; 2017.
6. Hirao M, Hashimoto J, Tsuboi H, Ebina K, Nampei A, Noguchi T, et al. Total Ankle Arthroplasty for Rheumatoid Arthritis in Japanese Patients. JBJS Open Access. 2017 Dec 1;2(4):E0033.
7. Mousavian A, Baradaran A, Schon LC, Daniel J, Pedowitz D, Kachooei AR. Total Ankle Replacement Outcome in Patients With Inflammatory Versus Noninflammatory Arthritis: A Systematic Review and Meta-analysis. Vol. 16, Foot and Ankle Specialist. SAGE Publications Ltd; 2023. p. 314–24.
8. Wakabayashi H, Nakata K, Nishimura A, Hasegawa M, Sudo A. The Onset of Subtalar Joint Monoarthritis in a Patient with Rheumatoid Arthritis. Diagnostics. 2022 Oct 1;12(10).
9. Usuelli FG, Maccario C, Manzi L, Gross CE. Clinical Outcome and Fusion Rate Following Simultaneous Subtalar Fusion and Total Ankle Arthroplasty. Foot Ankle Int. 2016 Jul 1;37(7):696–702.
10. Herrera-Pérez M, Valderrabano V, Godoy-Santos AL, de César Netto C, González-Martín D, Tejero S. Ankle osteoarthritis: comprehensive review and treatment algorithm proposal. EFORT Open Rev. 2022;7(7):448–59.