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BILATERAL ACHILLES TENDON RUPTURE FOLLOWING A FALL FROM HEIGHT: CASE REPORT

I Gede Bramantya Surya Mahendra[1*], Dyah Purnaning[2]
[1]Faculty Of Medicine, Universitas Mataram, Jl. Majapahit No.62, Gomong, Selaparang, Mataram, Nusa Tenggara Barat 83115, Indonesia
[2]Department of Orthopaedics and Traumatology, Rumah Sakit Umum Daerah Provinsi Nusa Tenggara Barat, Jl. Prabu Rangkasari, Dasan Cermen, Sandubaya, Mataram, Nusa Tenggara Barat 84371, Indonesia
*gedebramantya82@gmail.com

ABSTRACT
Achilles tendon rupture is an injury characterized by partial or complete disruption of the Achilles tendon, commonly caused by trauma or a sudden change in foot position. This condition accounts for approximately 20% of all major tendon ruptures. This study aims to present and analyze a rare case of bilateral Achilles tendon rupture, emphasizing the clinical presentation, diagnostic challenges, and management considerations. Men are at 2–12 times higher risk than women, with the incidence increasing between the ages of 40 and 59 years. Diagnosis is established through history taking, physical examination, and imaging modalities such as ultrasonography or MRI. We report a case of a 53-year-old male who presented with pain and swelling in both posterior ankles for the past three months, following a fall from a height of approximately four meters. The patient experienced limited mobility and required a walking aid. Physical examination revealed bilateral edema, a palpable defect in the Achilles tendon, tenderness, a positive Thompson test, and weakness of plantar flexion. MRI confirmed bilateral Achilles tendon rupture. The patient had previously undergone conservative management, including the application of an ankle strap and administration of nonsteroidal anti-inflammatory drugs, with no improvement. Bilateral Achilles tendon rupture is a rare condition, typically resulting from high-energy trauma. Delayed diagnosis and treatment may increase the risk of complications and long-term disability. Management options include conservative or surgical approaches, selected based on patient age, extent of rupture, and activity level. Bilateral Achilles tendon rupture following a fall from height is an uncommon case, highlighting the importance of prompt diagnosis and appropriate treatment to prevent permanent functional impairment.

Keywords: achilles tendon rupture; bilateral; trauma

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INTRODUCTION

Tendons are dense connective tissues that connect muscles to bones and play a crucial role in human movement. This structure enables the transmission of muscle contraction forces to bones, thereby supporting functional activities such as walking, running, and jumping. Injuries to tendons can lead to significant biomechanical impairment and a decrease in patients' quality of life. One of the most commonly injured tendons is the Achilles tendon. It is formed by the confluence of three muscles: the gastrocnemius, soleus, and plantaris, which insert onto the calcaneus. The Achilles tendon is the strongest and thickest tendon in the human body, measuring approximately 15 cm in length, and it plays an essential role in plantarflexion, walking, running, and jumping (Noor, 2020).

Achilles tendon rupture refers to a partial or complete tear that occurs due to trauma or a sudden change in foot position, particularly during maximal passive dorsiflexion. This condition can result from direct trauma caused by blunt or sharp objects to the distal lower leg. The most common mechanism of injury occurs during high-energy sports activities, whereas spontaneous ruptures typically occur in tendons with chronic degeneration(Park et al., 2020). Epidemiologically, Achilles tendon ruptures account for approximately 20% of all major tendon ruptures, with an estimated prevalence of 11 to 37 cases per 100,000 population per year. Men have a 2- to 12-fold higher risk compared to women, with the highest incidence observed in individuals aged 40–59 years. This

injury often occurs in physically active individuals with decreased tendon elasticity (Park et al., 2020).

Clinical manifestations of Achilles tendon rupture include sudden pain, often accompanied by a “popping” sound or a sensation similar to being kicked in the calf, swelling, a palpable tendon defect, weakened plantarflexion, and a positive Thompson test. Despite these characteristic symptoms, approximately 25% of cases experience delayed diagnosis, which can increase the risk of complications and worsen prognosis(Ismunandar et al., 2021; Tarantino et al., 2020). Management of Achilles tendon rupture can be either conservative or surgical, depending on the patient’s age, activity level, and severity of the tear. Delayed treatment often complicates reconstructive procedures, increases the risk of complications, and leads to poorer outcomes (Wisnu, 2021). Based on this background, this article reports a rare case of bilateral Achilles tendon rupture following a fall from height in a 53-year-old male patient. This condition is uncommon and requires prompt diagnosis and appropriate management to prevent long-term functional impairment of the lower extremities. This study aims to present and analyze a rare case of bilateral Achilles tendon rupture, emphasizing the clinical presentation, diagnostic challenges, and management considerations.

METHOD

This study is a descriptive case report involving a 53-year-old male diagnosed with bilateral Achilles tendon rupture following a fall from height. The patient was referred from Adikarsa Praya Hospital and received further treatment at West Nusa Tenggara Provincial Hospital. Data were obtained through a comprehensive medical history, physical examination, diagnostic imaging, and review of medical records. The medical history included the chief complaint, history of present illness, past medical history, medication history, and social history. A thorough physical examination was performed, encompassing both general status and local examination of the lower extremities. The assessed parameters included the presence of edema, open wounds, Thompson test results, palpation for Achilles tendon defects, tenderness, arterial pulse strength (posterior popliteal, posterior tibial, and dorsalis pedis arteries), active and passive range of motion (ROM), as well as plantarflexion and dorsiflexion muscle strength using the Medical Research Council (MRC) scale. Imaging studies were performed using Magnetic Resonance Imaging (MRI) to confirm bilateral Achilles tendon rupture. Clinical data, physical examination findings, and imaging results were analyzed descriptively and presented in narrative form with clinical photographs. Initial management included bilateral ankle strap application and administration of nonsteroidal anti-inflammatory drugs (NSAIDs). This case report was prepared in accordance with the CARE (Case Report) guidelines.

RESULT

The patient is a 53-year-old male referred from Adikarsa Praya Hospital with complaints of pain in both posterior ankles for the past three months. The pain in the posterior ankle region was persistent, causing the patient to be unable to walk and requiring the use of a cane. The pain worsened with walking and improved with rest. The patient also reported swelling in both posterior ankles for the same duration, which similarly worsened with walking and improved with rest. The symptoms began after the patient fell from a height of approximately 4 meters while working on building a wall at home three months ago. The wooden ladder the patient was sitting on broke, causing him to fall. Both ankles struck a wooden beam below and were subsequently hit again by falling wood. The patient denied other symptoms such as fever. Bowel and urinary functions were normal.

The patient was previously referred to Yatofa Hospital, where he was treated with bilateral ankle straps, meloxicam, and bed rest for one month; however, symptoms did not improve. The patient had never experienced similar complaints before and had no history of hypertension, diabetes

mellitus, or other chronic illnesses. There was no history of prior surgery or allergies. No similar complaints were reported in the family. The patient works as a daily laborer. The patient was in good general condition with a Glasgow Coma Scale (GCS) score of E4V5M6, fully conscious, and vital signs within normal limits. Head and neck examination was unremarkable, as were thoracic and abdominal examinations. Upper and lower extremities were warm with a capillary refill time (CRT) of less than 2 seconds. On the left lower extremity, there was edema in the Achilles tendon region (Figure 1), no open wounds, and a positive Thompson test (Figure 2). A palpable gap was noted between the Achilles tendon ends, with no tenderness on palpation of the tendon region. Pulses (popliteal, posterior tibial, and dorsalis pedis arteries) were strong. Active range of motion (ROM) was limited with pain on dorsiflexion and plantarflexion; passive ROM was also painful. Muscle strength for plantarflexion was graded 3/5 and for dorsiflexion 4/5. Similar findings were noted in the right lower extremity, including edema in the Achilles tendon region (Figure 1), no open wounds, positive Thompson test, a palpable gap in the tendon, no tenderness, strong arterial pulses, painful active and passive ROM, and muscle strength of 3/5 for plantarflexion and 4/5 for dorsiflexion.

Figure 1. Edema in the Achilles tendon region

Figure 2. Positive Thompson test. No plantarflexion observed upon compression of the gastrocnemius region.

On bilateral ankle Magnetic Resonance Imaging (MRI) without contrast performed on June 20, 2024, bilateral Achilles tendon rupture was identified, characterized by discontinuity of tendon fibers accompanied by increased signal intensity at the injury site, indicating soft tissue edema (Figure 3). Additionally, bilateral posterior talofibular ligament sprain was detected without evidence of complete rupture. No bone fractures or ankle joint dislocations were observed. Based on clinical findings, physical examination, and imaging results, the patient was diagnosed with bilateral Achilles tendon rupture accompanied by bilateral posterior talofibular ligament sprain. Considering the persistent pain, limited mobility, and MRI findings confirming tendon rupture, the patient was scheduled for bilateral Achilles tendon reconstruction and repair.

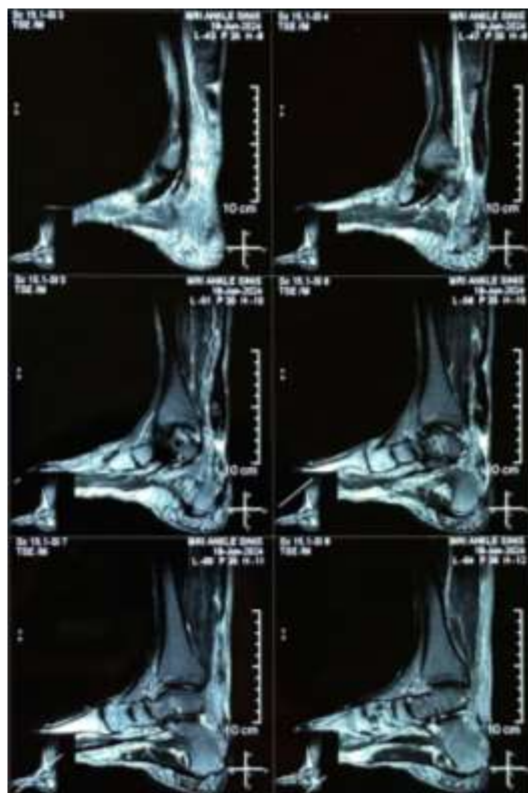

Figure 3. Bilateral ankle MRI without contrast showing bilateral Achilles

DISCUSSION

A 53-year-old male patient presented to the West Nusa Tenggara Provincial General Hospital (RSUD Provinsi NTB) with complaints of pain and swelling in both posterior ankles, which had persisted for approximately three months. The symptoms began following a workplace accident, in which the patient fell from a height of approximately four meters while building a house wall. After the incident, the patient experienced a sudden onset of severe pain in the posterior region of both ankles, accompanied by bilateral swelling. The pain was persistent and interfered with daily activities. The patient was unable to walk normally and required a cane for mobility.

Male gender has been shown to be associated with a 2- to 12-fold increased risk of Achilles tendon rupture compared to females(Park et al., 2020) (Park et al., 2020). The incidence of Achilles tendon rupture increases significantly among individuals aged 40 to 59 years(Briggs-Price et al., 2024). Common causes of Achilles tendon rupture include direct trauma, sports-related injuries, and motor vehicle accidents(Nair et al., 2023). Typical symptoms in patients with Achilles tendon rupture include sudden and severe pain in the back of the ankle, accompanied by swelling, difficulty walking, and inability to stand on the toes (Nasrul, 2019). In most cases, patients lose the ability to walk unaided immediately after the injury occurs(Wisnu, 2021).

On physical examination of the left lower extremity, edema was observed in the Achilles tendon region, a positive Thompson test, a palpable defect along the tendon, and restricted motion with pain during both active and passive range of motion (ROM), including dorsiflexion and plantarflexion. Muscle strength was graded 3/5 for plantarflexion and 4/5 for dorsiflexion. Similar findings were noted in the right lower extremity, including edema in the Achilles tendon region, a positive Thompson test, a palpable tendon defect, limited and painful active and passive ROM, with plantarflexion strength of 3/5 and dorsiflexion strength of 4/5.

In patients with Achilles tendon rupture, physical examination typically reveals a palpable gap along the tendon. According to McNeilan & Jones (2017) tendon palpation to detect this defect demonstrates a sensitivity of 73% and a specificity of 89%. The Thompson test is considered one of the most reliable clinical assessments, with a reported sensitivity of 96% and specificity of 93%, making it highly valuable for confirming the diagnosis of Achilles tendon rupture. Additionally, patients generally experience difficulty performing plantarflexion due to disruption of tendon continuity; however, the movement may not be completely absent, depending on the extent of the rupture and compensatory activity from other muscles(Wisnu, 2021).

Achilles tendon rupture caused by trauma, such as a fall from height, is a significant injury typically characterized by acute pain and a sensation similar to being struck in the back of the ankle. This type of injury commonly occurs in active individuals, particularly those engaged in sports or strenuous physical activities(Utashima et al., 2020;Tarantino et al., 2020). The injury mechanism usually involves sudden dorsiflexion or excessive tension on the ankle, which can be exacerbated by pre-existing tendon conditions or inadequate warm-up. A fall from height, for instance, can exert sudden force on the Achilles tendon, leading to rupture. Patients often report hearing a "popping" sound accompanied by severe pain immediately after the injury, resembling the sensation of being kicked in the leg(Hartman et al., 2024; Wang et al., 2024)

Risk factors for this condition include individuals aged 30–50 years, particularly "weekend warriors" who participate in high-intensity activities sporadically (Shamrock & Varacallo, 2021), as well as predisposing conditions such as tendinosis, corticosteroid use, or the intake of certain medications like fluoroquinolones (Utashima et al., 2020). Diagnosis is generally based on clinical assessment, including the Thompson test to evaluate tendon continuity (Waldman, 2024). Management often requires surgical intervention, particularly in cases of complete rupture, to restore ankle function and mobility(Liu & Qu, 2020).

According to the American Academy of Orthopaedic Surgeons (AAOS), the diagnosis of Achilles tendon rupture can be established when two or more clinical signs are present, such as a positive Thompson test, decreased plantarflexion strength, a palpable gap distal to the insertion site, and a positive Matles test(Nasrul, 2019). The patient subsequently underwent Magnetic Resonance Imaging (MRI), which revealed bilateral Achilles tendon rupture characterized by discontinuity of the tendon fibers accompanied by soft tissue edema, as well as bilateral posterior talofibular ligament sprain. MRI is considered one of the gold standard diagnostic methods for confirming Achilles tendon rupture, with a reported sensitivity of 90.9% and specificity of 100% (Dams et al., 2017; Wisnu, 2021). Based on the combination of clinical history, physical examination, and imaging findings, the patient was diagnosed with bilateral Achilles tendon rupture accompanied by bilateral posterior talofibular ligament sprain. Given the persistent pain, limited mobility, and risk of complications if left untreated, the patient was scheduled to undergo bilateral Achilles tendon reconstruction. The gold standard technique for managing Achilles tendon rupture is open end-to-end repair using non-absorbable sutures, as this approach provides optimal tensile strength, minimizes the risk of rerupture, and supports functional recovery of the lower extremities (McNeilan & Jones, 2017).

CONCLUSION

Achilles tendon rupture is a condition characterized by the disruption of tendon continuity due to injury or trauma, with the highest incidence occurring between the ages of 40 and 59 years. Trauma is one of the most common causes of this injury. The typical clinical manifestation includes severe pain in the posterior aspect of the ankle, often resulting in inability to walk. Physical examination findings commonly include edema, a positive Thompson test, palpable tendon defect, pain, and weakness during plantarflexion. Magnetic Resonance Imaging (MRI) confirmed bilateral Achilles

tendon tears. The patient was diagnosed with bilateral Achilles tendon rupture and received management consistent with current evidence-based standards.

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