

How Imaging Helps Diagnose and Treat Arthritis

Introduction

Arthritis is a widespread condition that affects millions of people across all age groups, often limiting daily function and diminishing overall quality of life. It involves inflammation and structural changes within the joints, resulting in pain, stiffness, swelling, and reduced mobility.¹ Diagnostic imaging is essential for identifying these joint changes, helping clinicians determine the type and severity of arthritis. A clear understanding of arthritis includes recognizing how it affects the joints, how its forms differ, and how imaging reveals characteristic patterns that support precise diagnosis and effective treatment planning.

More Information

Arthritis can occur in any joint, but it most commonly affects the:

- Hands
- Knees
- Feet
- Hips
- Lower back¹

There are more than 100 types of arthritis, including:

- Osteoarthritis: natural wear-and-tear of joints
- Rheumatoid arthritis: immune system mistakenly attacks joints
- Gout: sharp uric acid crystals build up in joints
- Post-traumatic arthritis: after an injury damages joint structures¹

Diagnosing Arthritis

1. Physical examination
 1. Evaluation of the spine, joints, skin, and eyes
2. Laboratory analysis
 1. Blood tests to detect evidence of inflammation
 2. Joint fluid analysis when infection is suspected
3. Imaging techniques
 1. X-ray: assess cartilage loss, bone alignment, and structural changes
 2. Computer Tomography (CT): provide detailed views of deeper joints (spine and pelvis)
 3. Magnetic Resonance Imaging (MRI): visualize bone and soft tissues; detect subtle abnormalities
 4. Ultrasound (US): evaluate superficial joints and surrounding soft tissues²

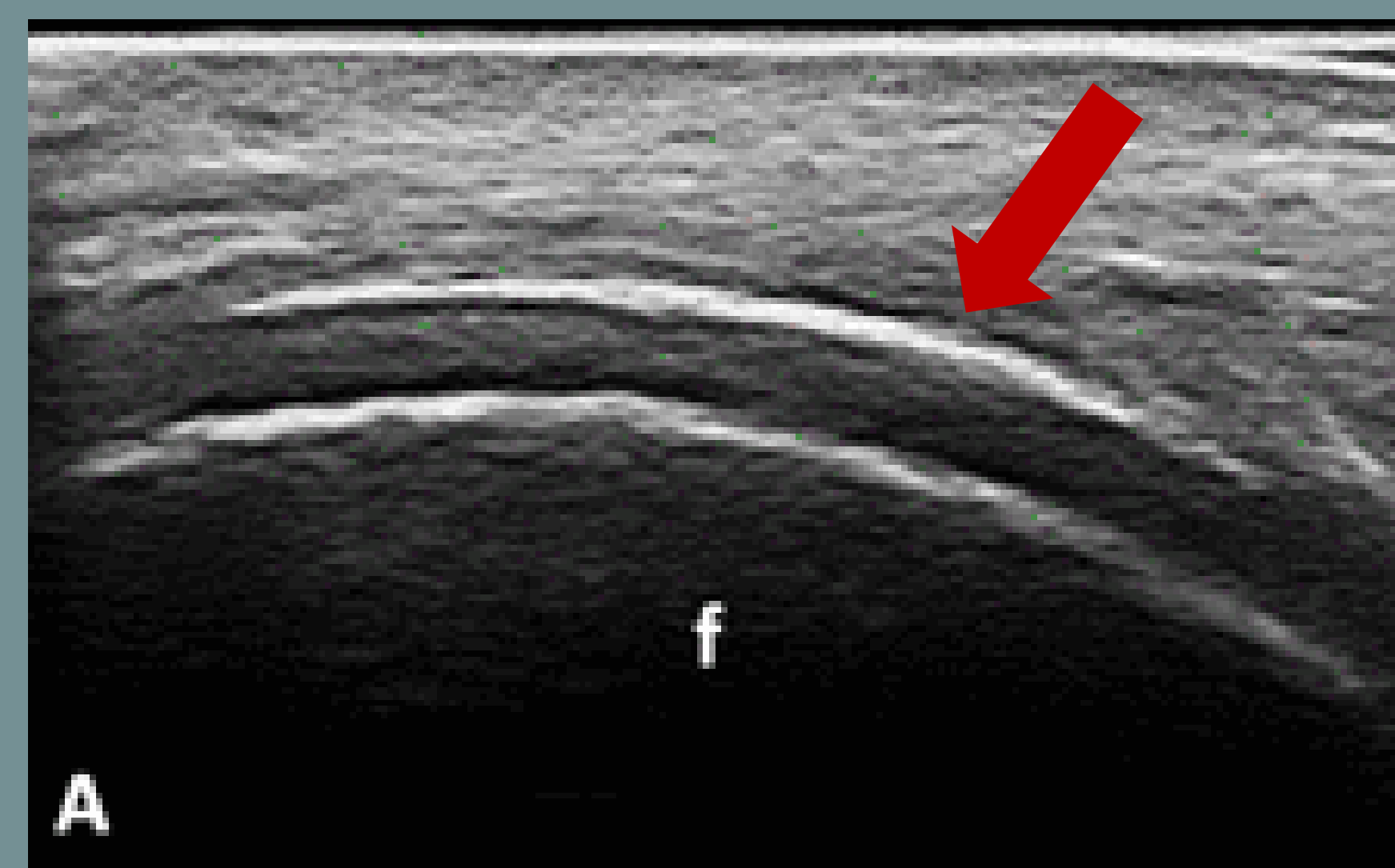


Figure 4: double contour line indicating gout on US⁵

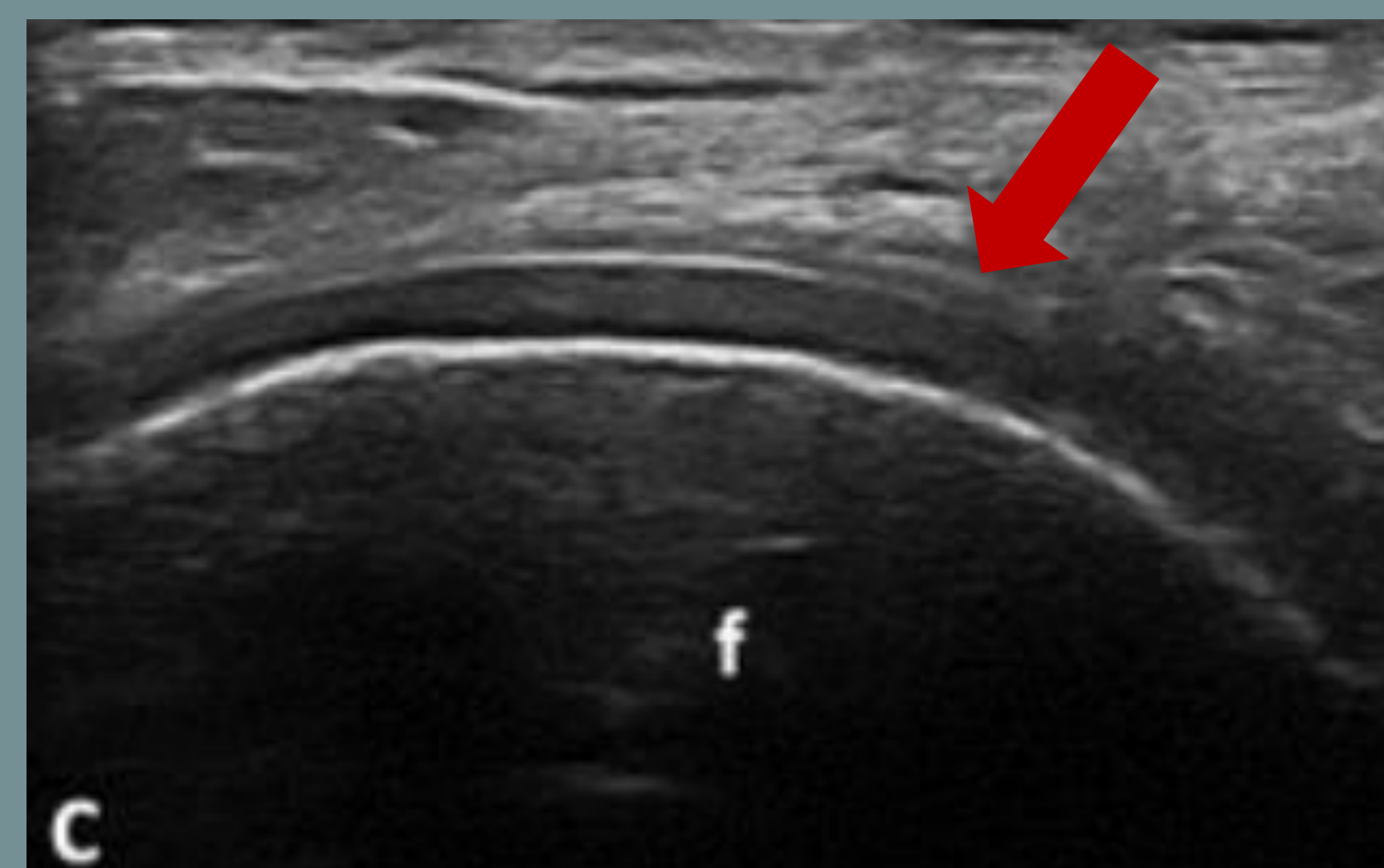


Figure 5: normal US appearance of hyaline cartilage⁵

Treatment

1. Depends on the type and severity of arthritis
 1. Medications
 2. Physical therapy
 3. Surgical procedures (joint replacement or fusion)²



Figure 1: X-ray of rheumatoid arthritis³

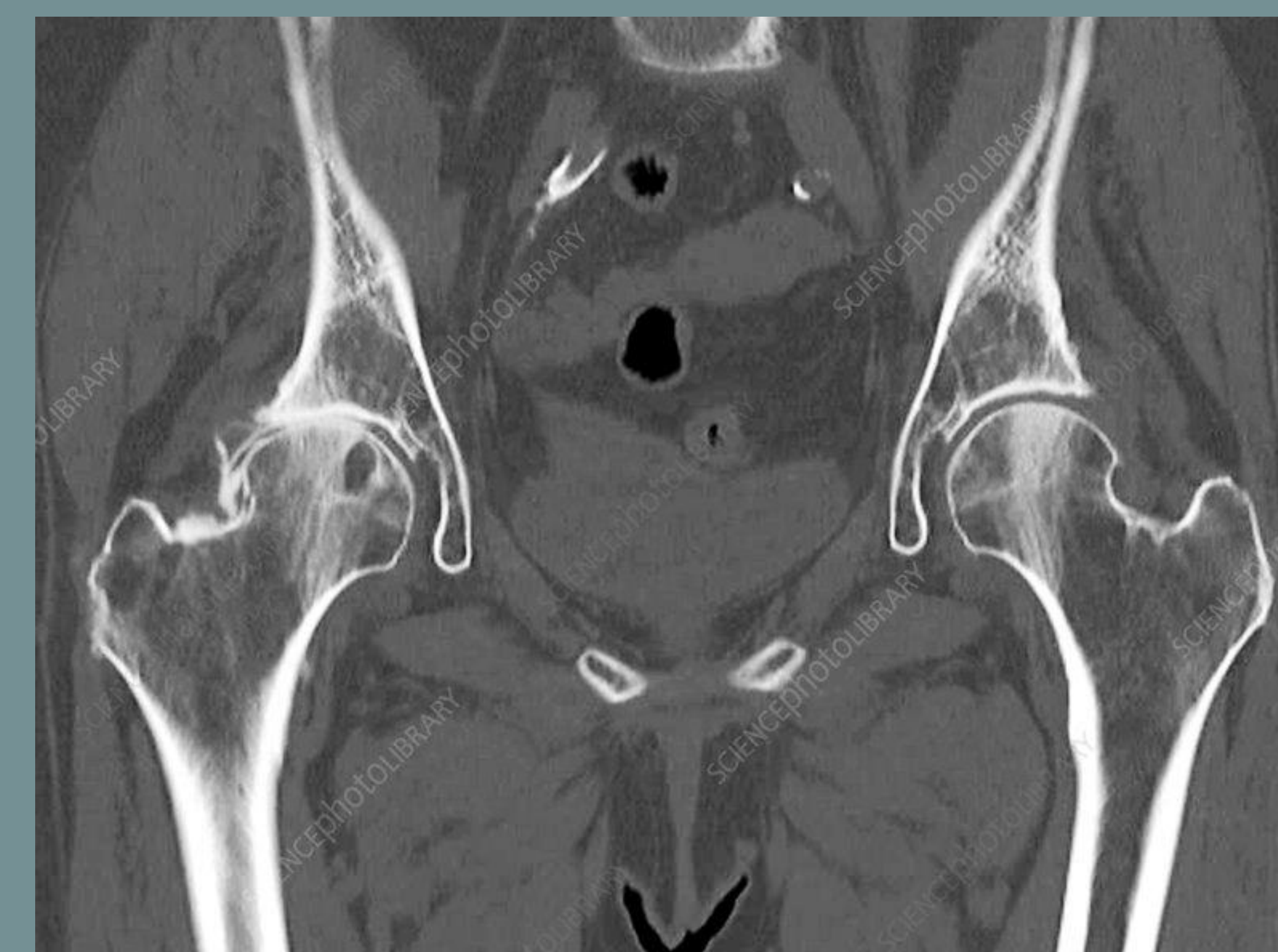


Figure 2: CT of osteoarthritis in the right hip⁴



Figure 3: MRI of arthritis in the knee⁶

Imaging Characteristics

- Joint space narrowing
- Bone erosions
- Demineralization
- Soft-tissue swelling
- Subluxation/dislocation
- Calcifications
- Bone production⁷

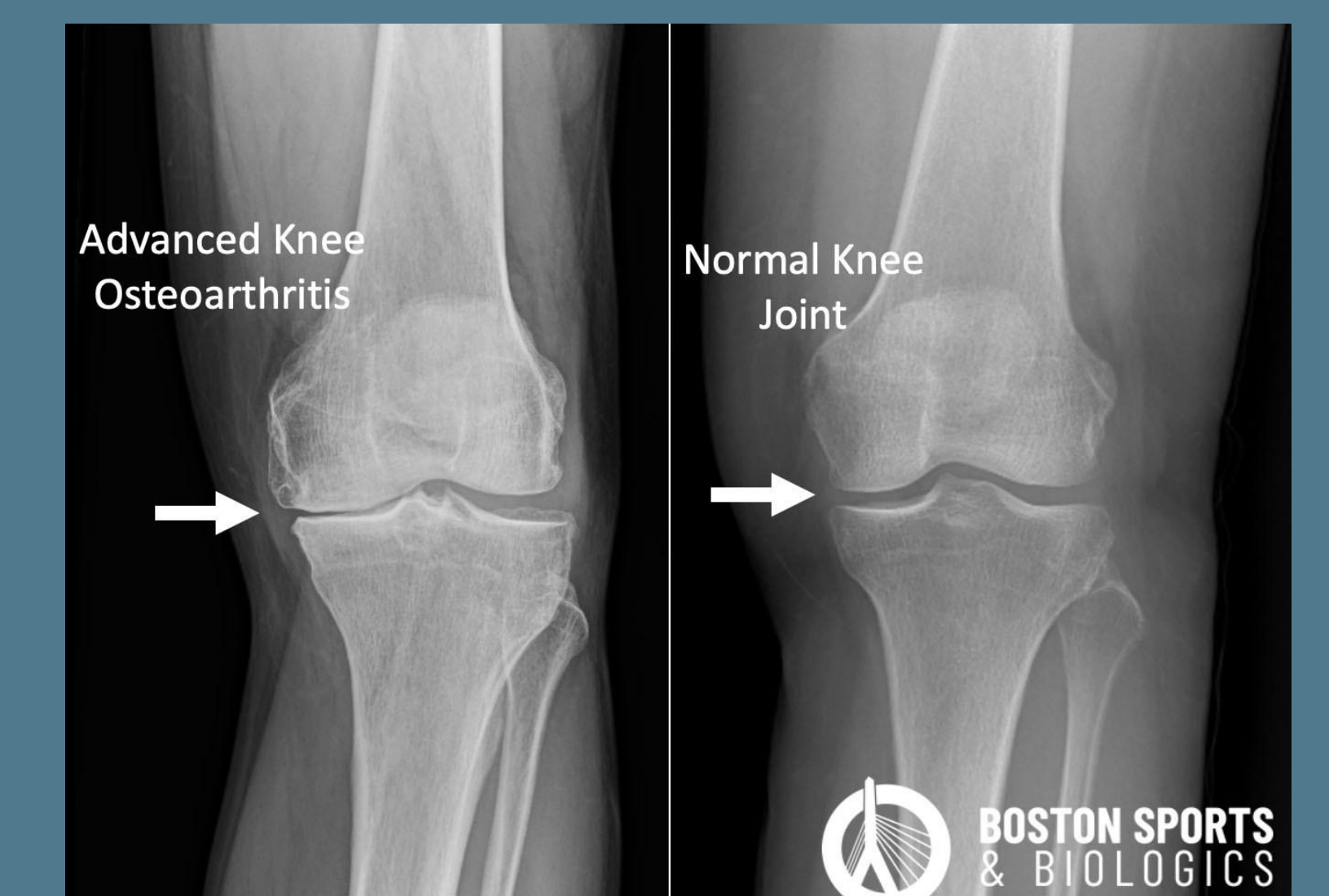


Figure 6: arthritis X-ray vs normal X-ray⁸

References

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