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The Impact of Antileukemic Treatment on Joint Osteonecrosis in Adolescents with Acute Lymphoblastic Leukemia

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Faculty Disclosure Information

- Nothing to disclosure.



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Joint osteonecrosis is a condition where bone tissue dies due to insufficient blood supply, leading to

joint pain

dysfunction

joint collapse



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It commonly
affects areas
like

the hip

knee

shoulder

Can be linked
to factors
such as

trauma

corticosteroid
use

certain medical
conditions,
including
leukemia

The incidence of osteonecrosis following treatment for acute lymphoblastic leukemia (ALL) in adolescents varies, but studies suggest it can range from 10% to 30%. ¹



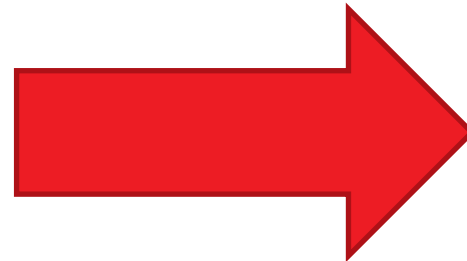
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The treatment of acute lymphoblastic leukemia (ALL) in adolescents can lead to osteonecrosis for several reasons:

- Corticosteroid Use
- Chemotherapy Effects
- Radiation Therapy
- Increased Bone Fragility
- Metabolic Changes



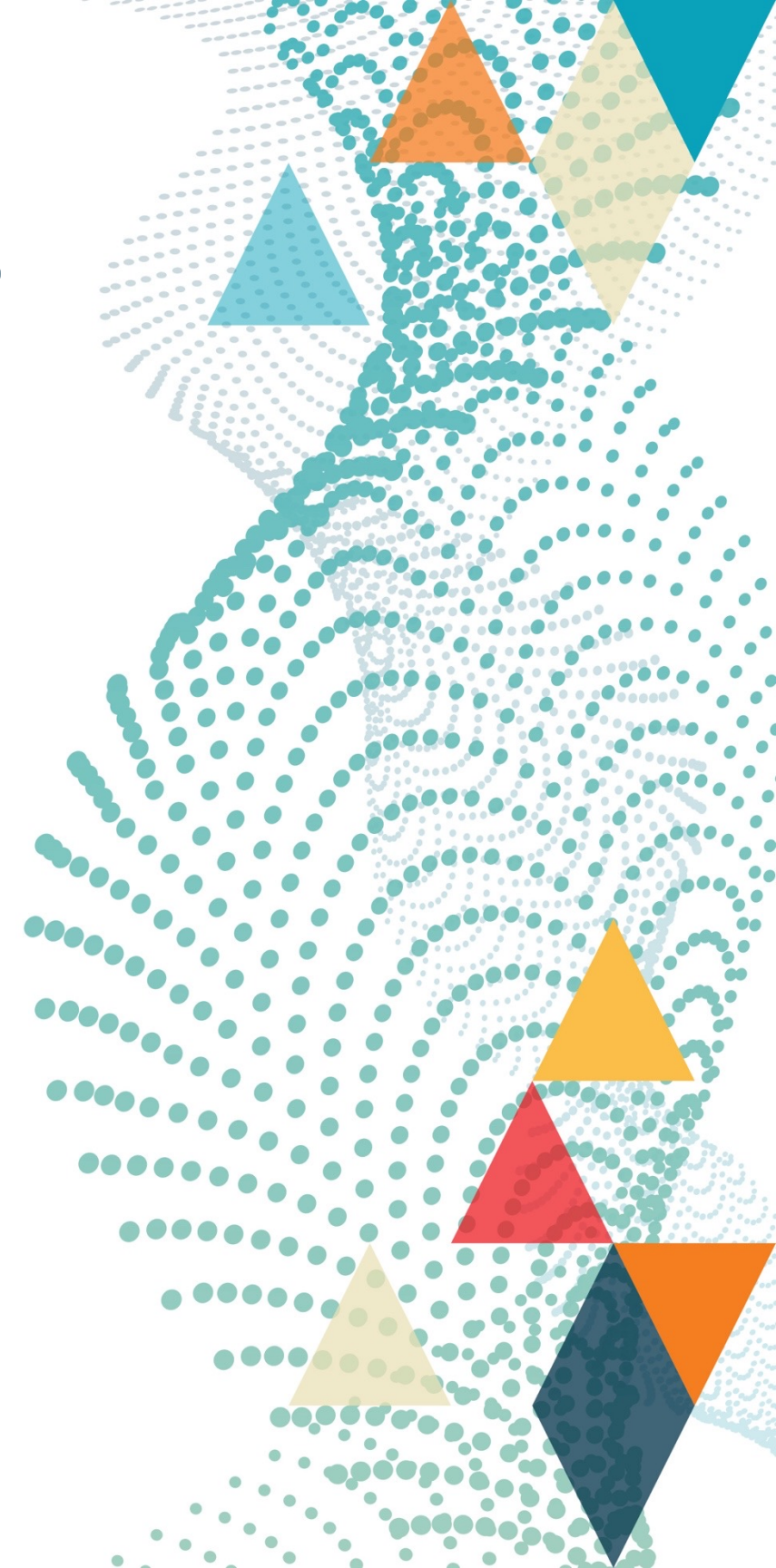
insufficient
blood supply²



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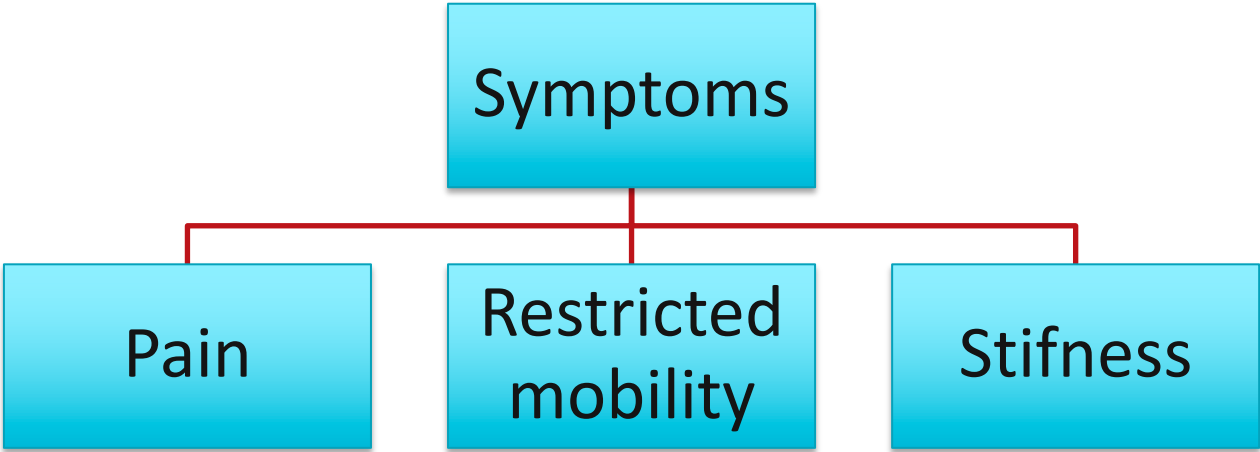


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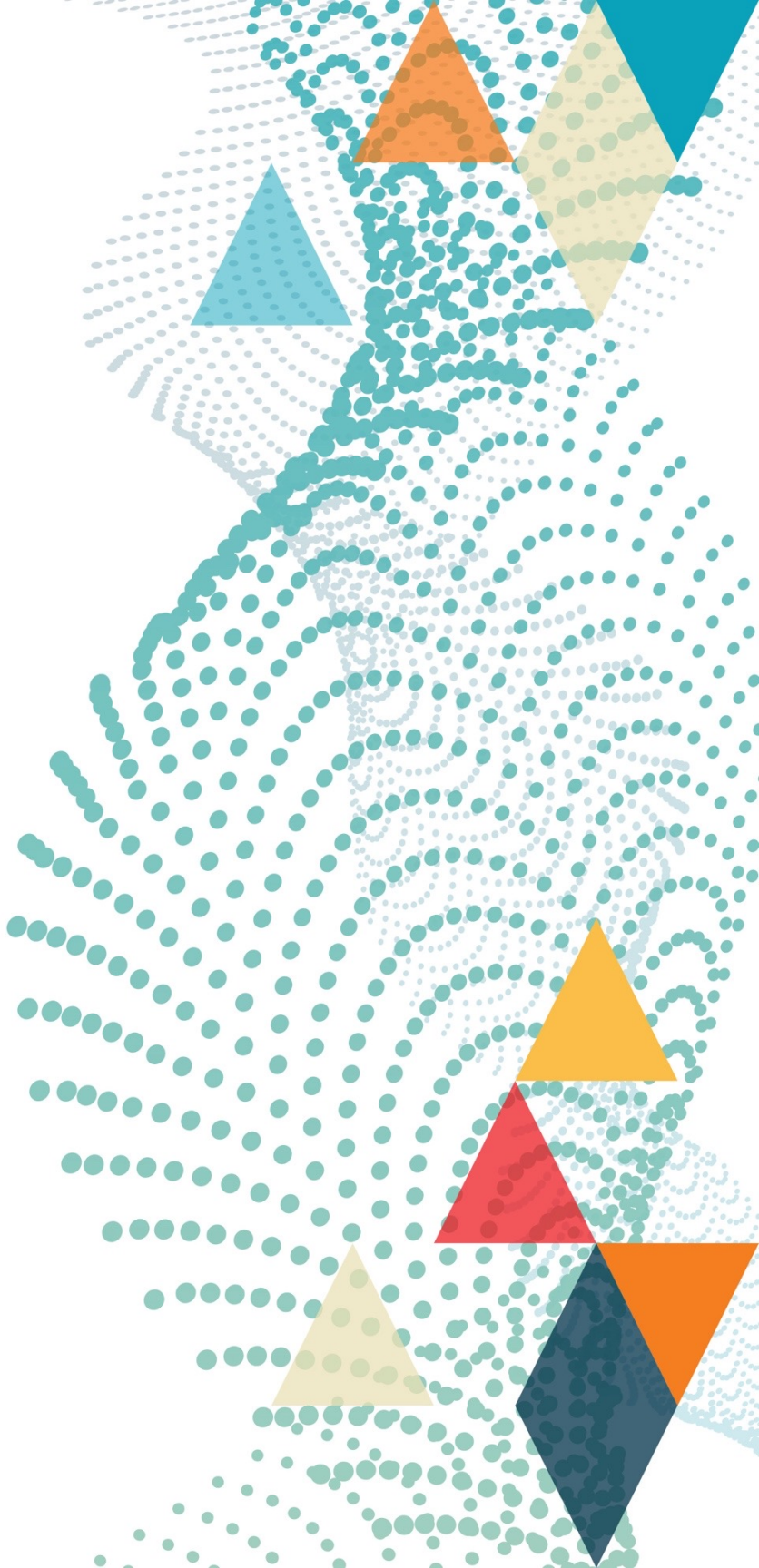


Case 1

17-year-old female
presenting with
osteonecrosis affecting
multiple joints: hips,
shoulders, knees, and
elbows

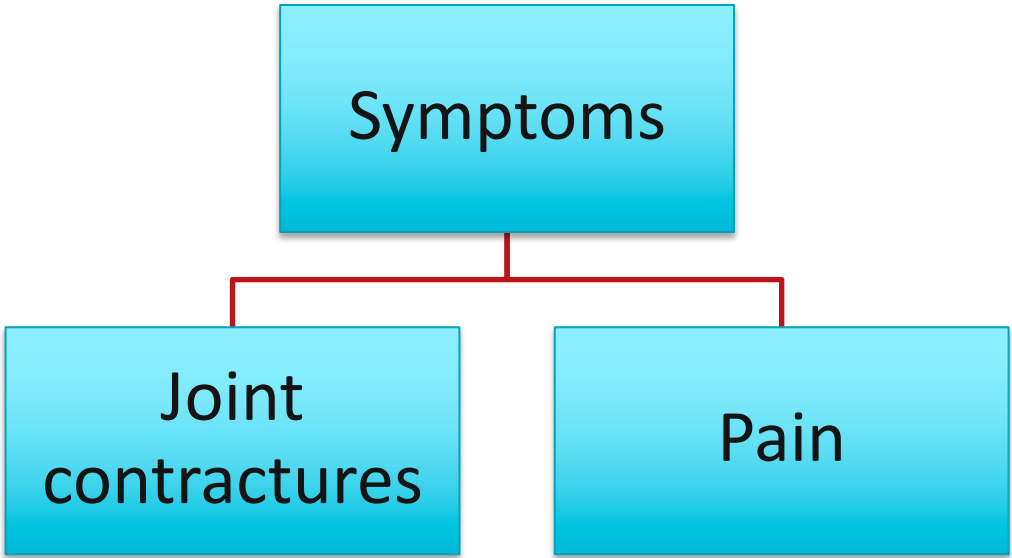


Score	Scale	Pre-Op (Poor Function)	Post-Op
WOMAC Hip	0–96	68 (Severe OA pain)	14 (Mild symptoms)
Oxford Knee Score	12–60	23 (Severe disability)	51 (Near-normal)
Constant-Murley (CMS)	0–100	32 (Pain/stiffness)	89 (Full function)

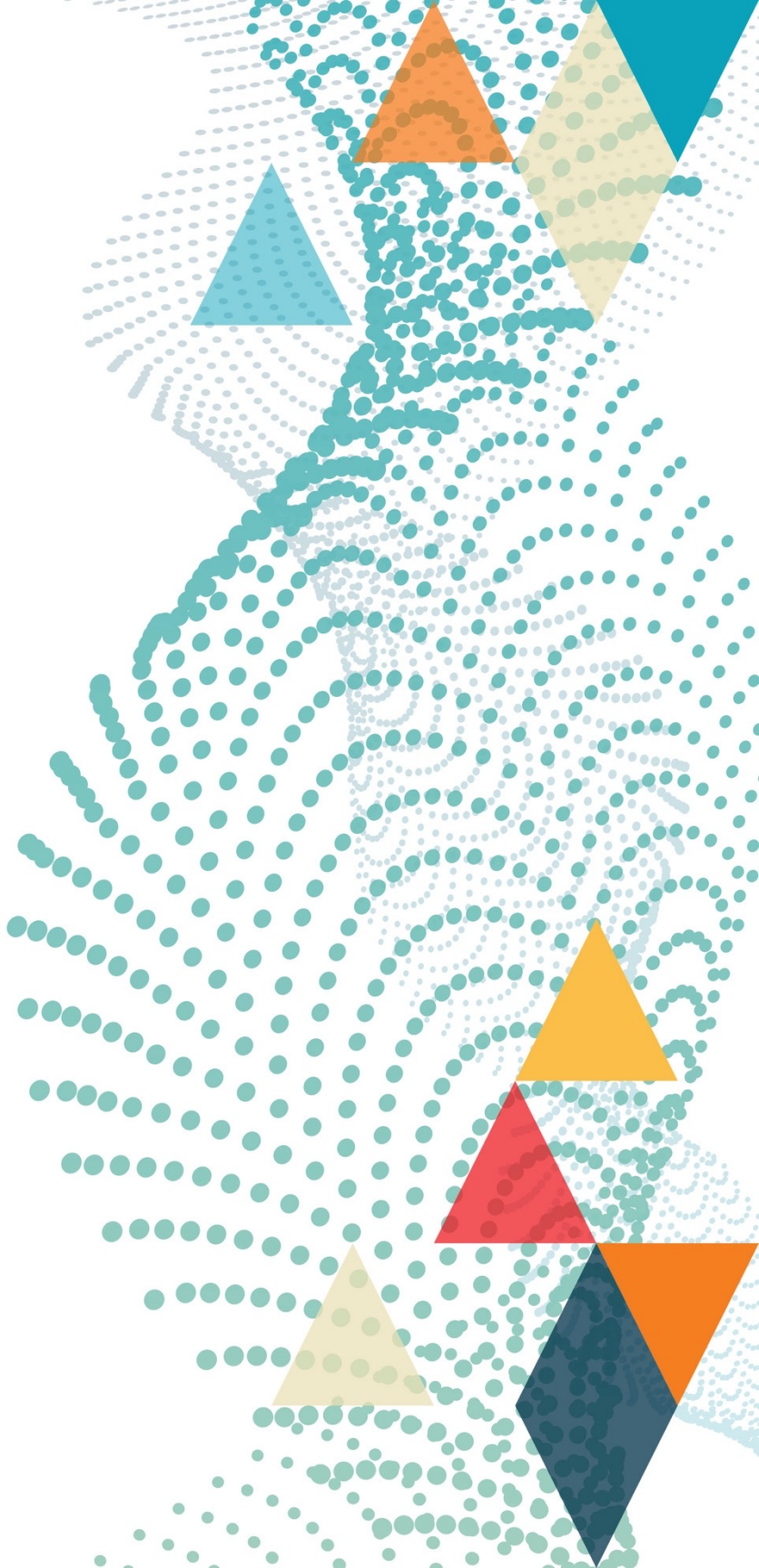


Case 2

16-year-old male,
demonstrated capitellar
osteonecrosis in both elbows
and talar osteonecrosis with
associated loose bodies.



Score	Scale	Pre-Op (Poor Function)	Post-Op (Improved)
AOFAS Ankle-Hindfoot	0–100	46 (Severe pain, contractures)	87 (Stable, functional)
Mayo Elbow (MEPS)	0–100	54 (Stiffness, weakness)	92 (Pain-free, full use)





RESULTS



Reduction in quality of life.




<https://www.dreamstime.com/tired-bored-exhausted-person-man-low-life-vital-battery-energy-power-level-icon-flat-cartoon-graphic-illustration-poor-bad-image304179865>



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- Early diagnosis is crucial. Magnetic resonance imaging (MRI) has become a vital tool in our arsenal, allowing for the detection of osteonecrosis at its earliest stages, often before clinical symptoms manifest. ³



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Treatment options – Multidisciplinary approach

Conservative management strategies

- Medication
- Physical therapy

Surgical options

- Arthroscopy
- Total arthroplasty
- Core decompression

Case 1: We initially performed an arthroscopy of the shoulder and both elbows, followed a few years later by total arthroplasties of the following joints: both hips, shoulders and knees.

Case 2: Arthroscopy of both elbows was performed, during which loose bodies were removed, as well as arthroscopy of both ankles.



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Case 1

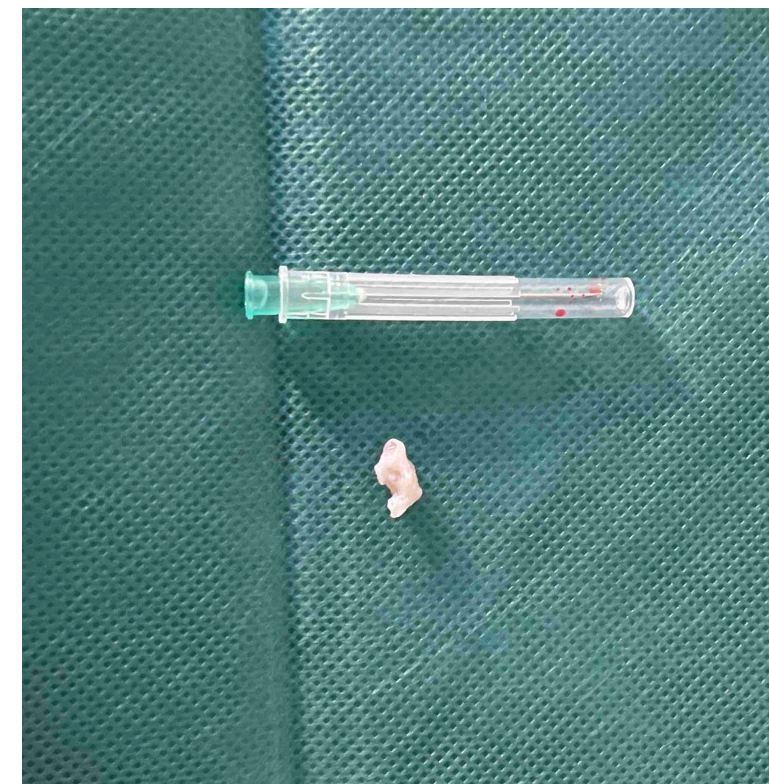


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Case 2



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References

- 1) **Kunstreich M, Kummer S, Laws HJ, Borkhardt A, Kuhlen M.** Osteonecrosis in children with acute lymphoblastic leukemia. *Haematologica*. 2016;101(11):1295-1305. doi:10.3324/haematol.2016.147595. PubMed PMID: 27742768; PMCID: PMC5394877.
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- 3) **Biddecì G, Bosco G, Varotto E, Corradin M, Geranio G, Tridello G, Pillon M, Carraro E, Garetto G, Assadi R, Gigante C, Putti MC.** Osteonecrosis in children and adolescents with acute lymphoblastic leukemia: early diagnosis and new treatment strategies. *Anticancer Res*. 2019 Mar;39(3):1259-1266. doi:10.21873/anticancer.13236.



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