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Introduction & Aim

Infected nonunion of subtrochanteric femoral fractures in adolescents is a **rare** and **highly challenging complication**, particularly after repeated fixation failure.

The presence of **uncommon pathogens** adds diagnostic and therapeutic complexity and may compromise outcomes.

We present a complex case aiming to highlight the effectiveness of a **staged, multidisciplinary approach** combining radical debridement, targeted antibiotic therapy, and bone transport for limb reconstruction.

Methods

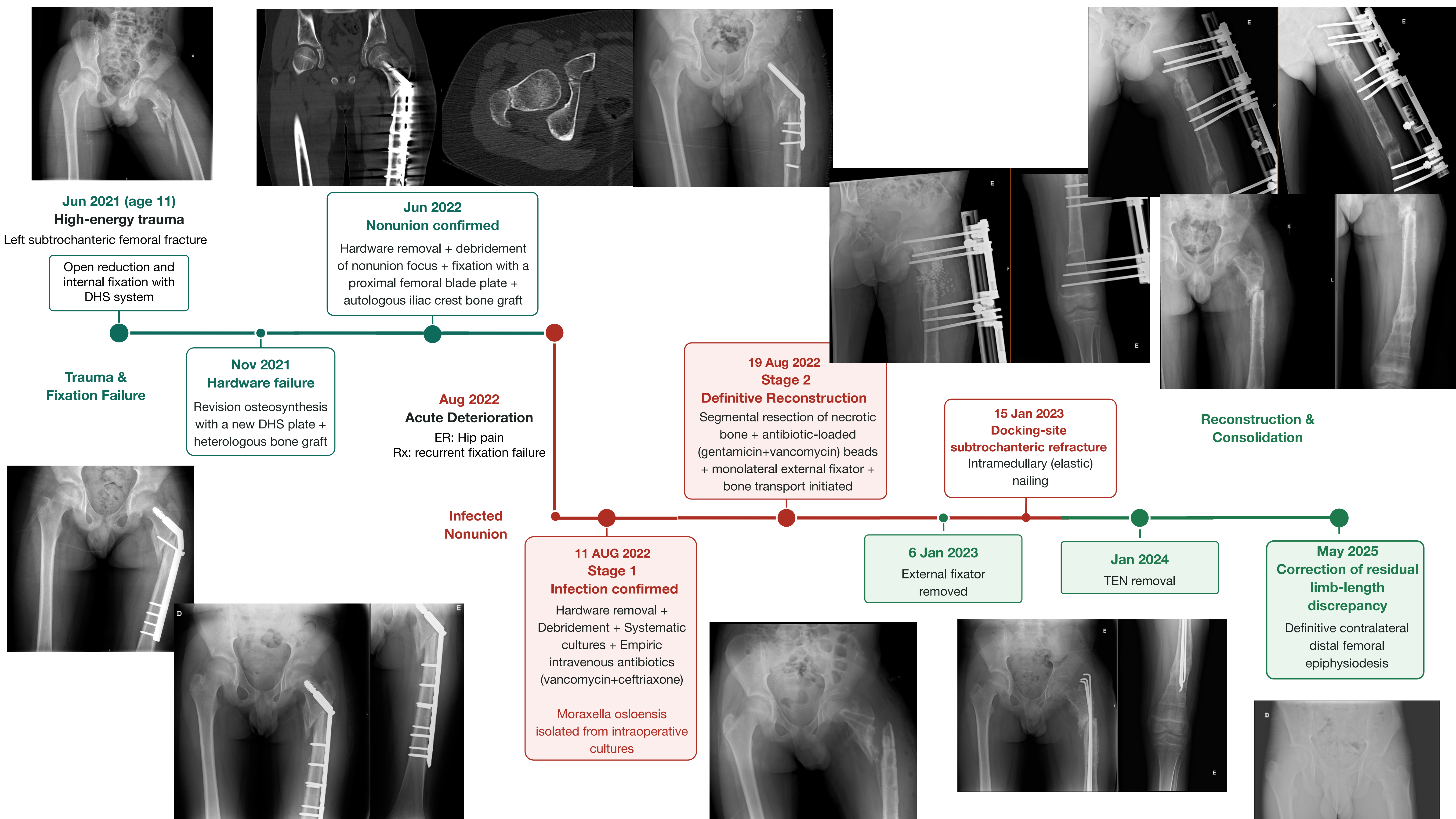
Male adolescent with a high-energy subtrochanteric femoral fracture, treated with multiple surgical procedures due to fixation failure and progression to nonunion. Clinical deterioration raised suspicion of deep infection, subsequently confirmed by intraoperative cultures.

Two-stage protocol:

(1) hardware removal and aggressive debridement with systematic microbiological sampling;

(2) definitive reconstruction with segmental resection and bone transport using a monolateral external fixator, alongside culture-directed intravenous antibiotic therapy within a multidisciplinary strategy

Case Course — From Fixation Failure to Infected Nonunion and Limb Reconstruction



What the Literature Shows

Who is at Risk

Nonunion after operative fixation of paediatric femoral shaft fractures is uncommon overall, but risk rises with comminution, external fixation, and repeated surgery.

In subtrochanteric fractures specifically, varus malalignment, loss of medial cortical support, and early nail dynamisation are the strongest independent predictors of nonunion.

High-energy mechanism plus multiple prior fixation attempts, as in this case, compounds the risk of both nonunion and secondary infection.

Moraxella osloensis: A Rare Pathogen

M. osloensis is a skin/mucosal commensal only rarely implicated in invasive disease – fewer than 40 cases of clinically significant infection have been reported in total.

Reported presentations include endocarditis, meningitis, septic arthritis and osteomyelitis; osteoarticular infection remains exceptionally rare, particularly in adolescents.

Key Results

Persistent **subtrochanteric nonunion**, particularly in the setting of **repeated hardware failure**, should prompt a **high index of suspicion for an underlying low-grade chronic infection**, warranting early and exhaustive diagnostic evaluation

A structured **two-stage approach**—radical hardware removal and aggressive debridement, followed by definitive biological reconstruction via bone transport—is highly effective in achieving both complete infection eradication and successful limb salvage.

Active and **systematic intraoperative sampling** (multiple tissue and fluid cultures) **during revision surgeries** is **mandatory**.

