



# A JAK of All Trades

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## Background

- Janus kinase (JAK) inhibitors are a novel class of medications revolutionizing the treatment of inflammatory skin conditions
- Targeting the JAK-STAT signaling pathway, these small molecule inhibitors interrupt cytokine signaling and immune response.<sup>1</sup>
- Upadacitinib is a JAK inhibitor that primarily inhibits JAK1<sup>2</sup> and is approved to treat atopic dermatitis (AD).<sup>3</sup>

## Purpose

We report a case of severe AD with new onset hypertrophic lichen sclerosis (LS) in the setting of mast cell activation syndrome (MCAS) that all improved with upadacitinib.

## Initial Presentation

- **Patient:** A 12-year-old female with a complex past medical history of MCAS, AD, and autoimmune thyroiditis presented in October 2022 with new, non-symptomatic plaques on the labia minora and peri-anal skin
- **Duration:** 4 months
- **Relevant History:** Clinically diagnosed LS of the vulvar and perianal skin diagnosed in 2021

## Initial Exam

- The perianal skin, labia minora, and clitoral hood skin showed white, lichenified, slightly rugous plaques (Figure 1)
- The remainder of the physical examination showed numerous pink, lichenified plaques in the bilateral anti-cubital fossa (Figure 2) and popliteal skin were noted, consistent with worsening AD despite maximum dupilumab dose (300mg every other week)

## Initial Tests and Plan

- Given the change in morphology of the genital lesions compared to her previous LS, a punch biopsy was performed
- **Pathology:** Consistent with hypertrophic LS
- **Plan:** Restart clobetasol 0.05% ointment treatment to the labia minora, clitoral hood, and peri-anal skin. Additionally, as her AD was no longer responding to dupilumab, she was switched to upadacitinib 15mg daily

## Clinical Follow Up

- She was instructed to follow up in 3 months but was lost to follow up until December 2023
- After one year on upadacitinib, she showed substantial improvement in her AD, MCAS, and hypertrophic LS
- **AD:** She reported minimal eczematous patches, though she was experiencing a minor flare due to running out of upadacitinib (Figure 3)
- **MCAS:** She reported a decrease in the frequency and severity of MCAS-related headaches and GI symptoms
- **Hypertrophic LS:** Dramatically improved compared to the previous year (Figure 4), attributed to upadacitinib as she had not been applying topical medications



Figure 1: Perianal skin showing white, lichenified, slightly rugous plaques, with the labia minora and clitoral hood showing white atrophic plaques (10/25/22)



Figure 4: Areas surrounding urethra, labia minora, anus are without pallor, erythema, or edema (12/6/23)

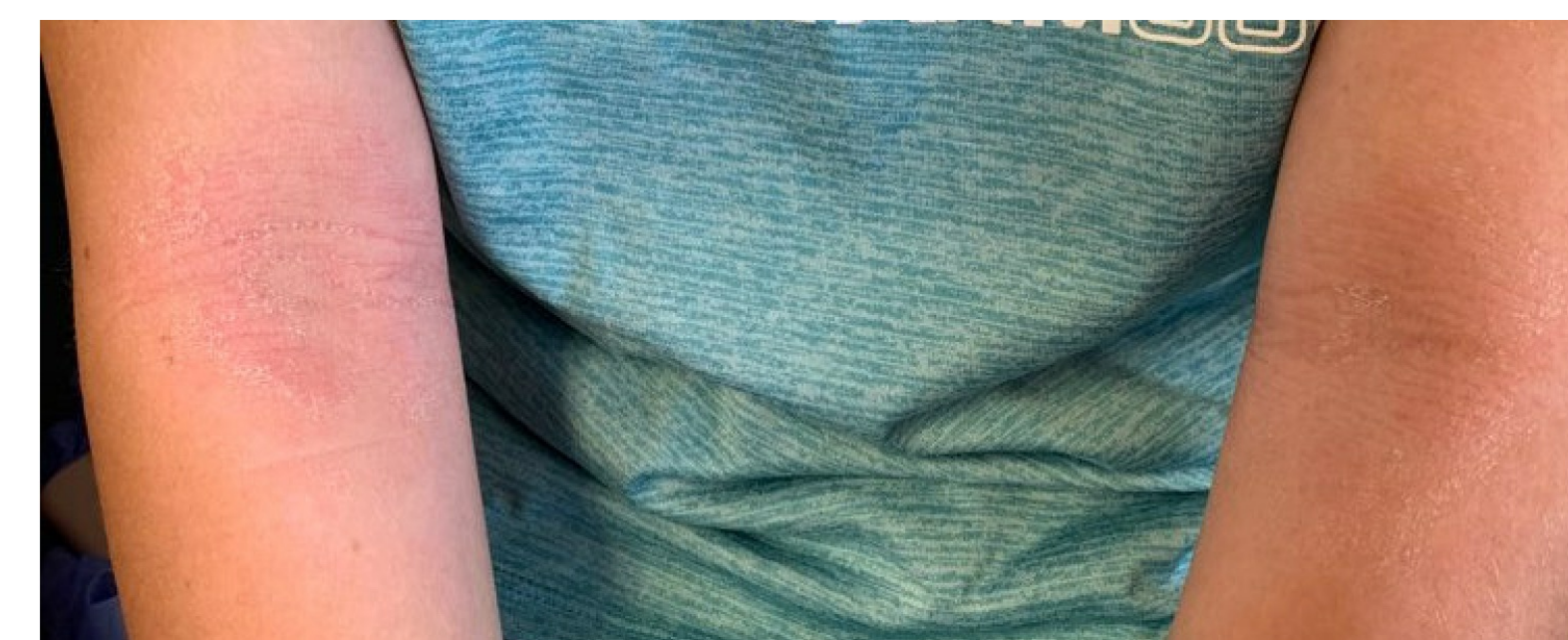


Figure 2: Erythematous, lichenified eczematous plaques with overlying xerosis on the antecubital fossa while on dupilumab (10/25/22)



Figure 3: Mildly erythematous and eczematous plaques in the antecubital fossa following a two-week interruption in upadacitinib treatment (12/6/23)

## Discussion

- While upadacitinib is known to be an effective treatment for AD, there is limited data regarding the effect of JAK inhibitors on MCAS and LS.
  - Upon review, there were five case reports in the literature documenting improvements in LS with JAK inhibitors
  - Furthermore, there were two case reports in the literature documenting improvements in MCAS with JAK inhibitors
- As research continues, the role of JAK inhibitors is expanding, with potential applications in a growing list of cutaneous diseases
- We present this case to highlight the potential use of JAK inhibitors in individuals with MCAS and LS

## References

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