

Introduction

- High burden of Ehlers-Danlos syndrome (EDS) among transgender and nonbinary (TGNB) patients
 - EDS: a group of inherited collagen disorders that affect connective tissues
- EDS increases risk of surgical complications (bleeding, delayed wound healing, dehiscence)
 - EDS → unique challenge for gender-affirming surgery (GAS)
- Understanding the impact of EDS on GAS outcomes, perioperative complications, and patient satisfaction is of growing importance to inform preoperative counseling and surgical planning
 - EDS patients are presenting with questions about the impact of EDS on GAS outcomes, including chest masculinization surgery (CMS), the most frequently performed GAS
 - Current literature does not provide answers
- This study investigates the impact of EDS on complications and adverse aesthetic outcomes of CMS

Objectives

1. **Determine the prevalence** of Ehlers-Danlos Syndrome (EDS) among transgender and nonbinary (TGNB) patients receiving gender-affirming care at this institution.
2. **Characterize demographic and clinical features** of TGNB patients with EDS who undergo chest masculinization surgery (CMS).
3. **Assess incidence and types of postoperative complications** and aesthetic concerns experienced by TGNB patients with EDS following CMS and describe the postoperative timeline of complication development.
4. **Compare surgical outcomes of patients with vs. without EDS** for patients undergoing double-incision CMS, adjusting for confounders such as age, BMI, testosterone use, and smoking history.
5. **Evaluate the impact of EDS on the likelihood of requiring additional interventions** such as wound washout, debridement, or revision surgery.

Methods

- Single-institution, retrospective review of TGNB adults with EDS who presented between January 2017 - September 2024
- Descriptive statistics calculated on demographics, health histories, and GAS experiences
- Complications and adverse aesthetic outcomes described for those who underwent CMS
- Patients with EDS were compared to those without EDS who underwent double-incision CMS between March 2022 - July 2024 to assess the association of EDS with postoperative outcomes
 - Bivariate and multivariable logistic regression were conducted
 - Potential confounders of age, BMI, testosterone use, and past smoking history used as covariates

Results

Characteristic	Number (n)	Percent (%)
Gender		
Transgender man	47	26.6
Transgender woman	14	7.9
Nonbinary, assigned female at birth	113	63.8
Nonbinary, assigned male at birth	3	1.7
Race		
American Indian or Alaska Native	4	2.3
Asian	7	4.0
Black or African American	4	2.3
White	157	88.7
Multiracial	1	0.6
Race not listed	4	2.3
Ethnicity		
Hispanic or Latino	10	5.6
Not Hispanic or Latino	167	94.4

Table 1. Patient Demographics of TGNB Adults with EDS
Demographic characteristics of TGNB patients over 18 with Ehlers-Danlos Syndrome who sought gender-affirming care at this institution between January 2017-September 2024.

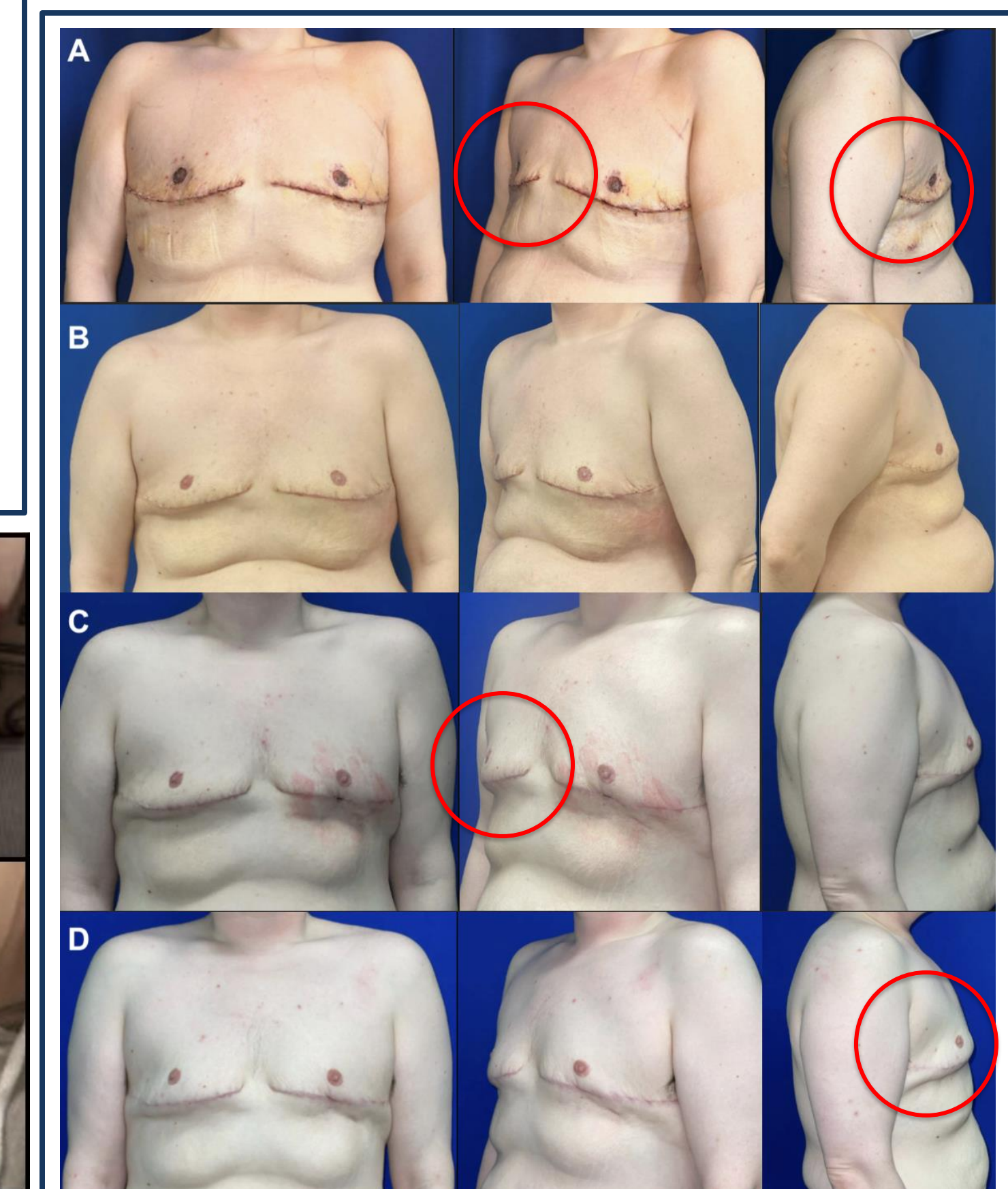


Figure 2 (above). Tissue Redundancy Development Over Time
Postoperative images of CMS results for one patient (A) 1 week, (B) 5 weeks, (C) 10 weeks, and (D) 4 months postoperatively. Red circles highlight areas of tissue redundancy over time.

Figure 1 (left). Scar Widening, Tissue Redundancy Development, and Wound Healing Over Time
Postoperative images of CMS results for one patient (A) 2 weeks, (B) 3 weeks, (C) 4 weeks, (D) 6 weeks, (E) 11 weeks, and (F) 4 months postoperatively. The development of wound dehiscence and scar widening of the vertical scars is shown at (G) 3 weeks, (H) 4 weeks, and (I) 6 weeks postop. Notable striae, a common occurrence in patients with EDS, appeared at 4 months postop (F).

- Prevalence of EDS among TGNB adults who accessed gender-affirming care during this period: 1.9% (n=177/9316)
- 14 underwent CMS with a mean (standard deviation) age of 25.1 (6.0) years old and mean body mass index (BMI) of 30.6 (6.9)
 - 78.6% (n=11) used exogenous testosterone, average of 17.6 (13.6) months before surgery
 - 71.4% (n=10) had a concurrent diagnosis of postural orthostatic tachycardia syndrome (consistent with prior literature)
 - Median CMS follow-up: 4.0 months
- Compared to 89 CMS patients without EDS, post-CMS patients with EDS had a significantly greater odds of experiencing (adjusted odds ratio [95% confidence interval]):
 - Wound dehiscence (5.9 [1.2-27.4], p=0.02)
 - Wound washout or debridement (9.5 [1.0-102.9], p=0.04)
 - Revision surgery for excess tissue removal (7.0 [1.5-33.7], p=0.01)
- Patients with EDS did not have a significantly greater odds of experiencing wound infection, scar widening, or standing cone deformities
- No significant difference in age, BMI, smoking history, or testosterone use
- No intraoperative or major postoperative complications such as sepsis, deep vein thrombosis, or pulmonary embolism occurred for any CMS patients with EDS

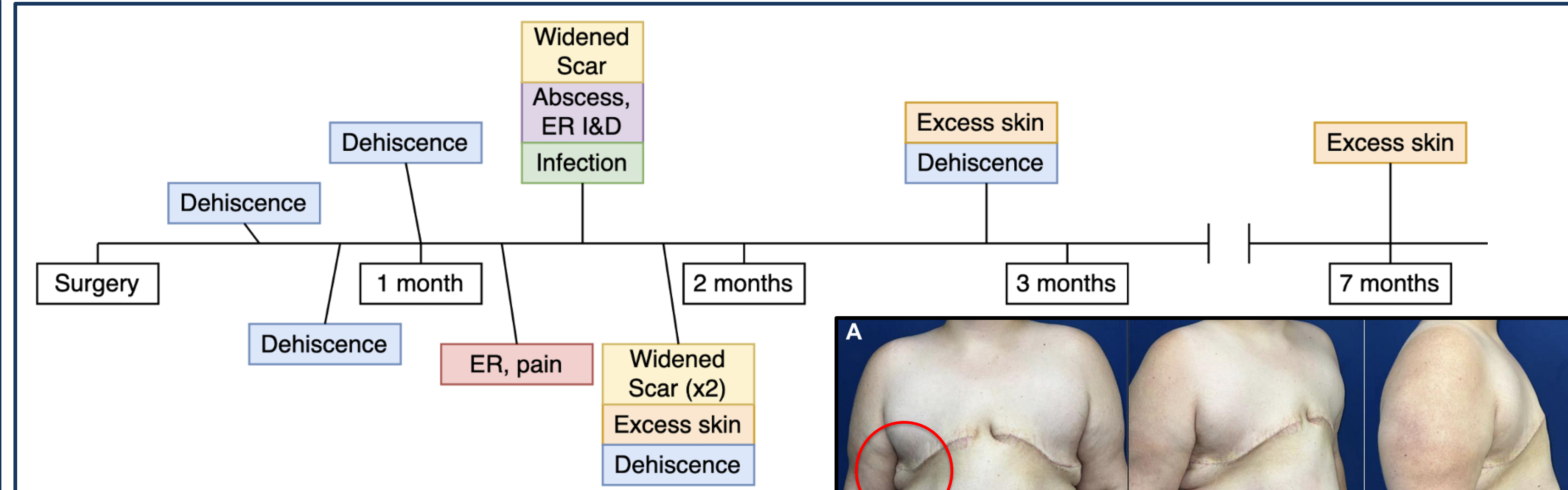
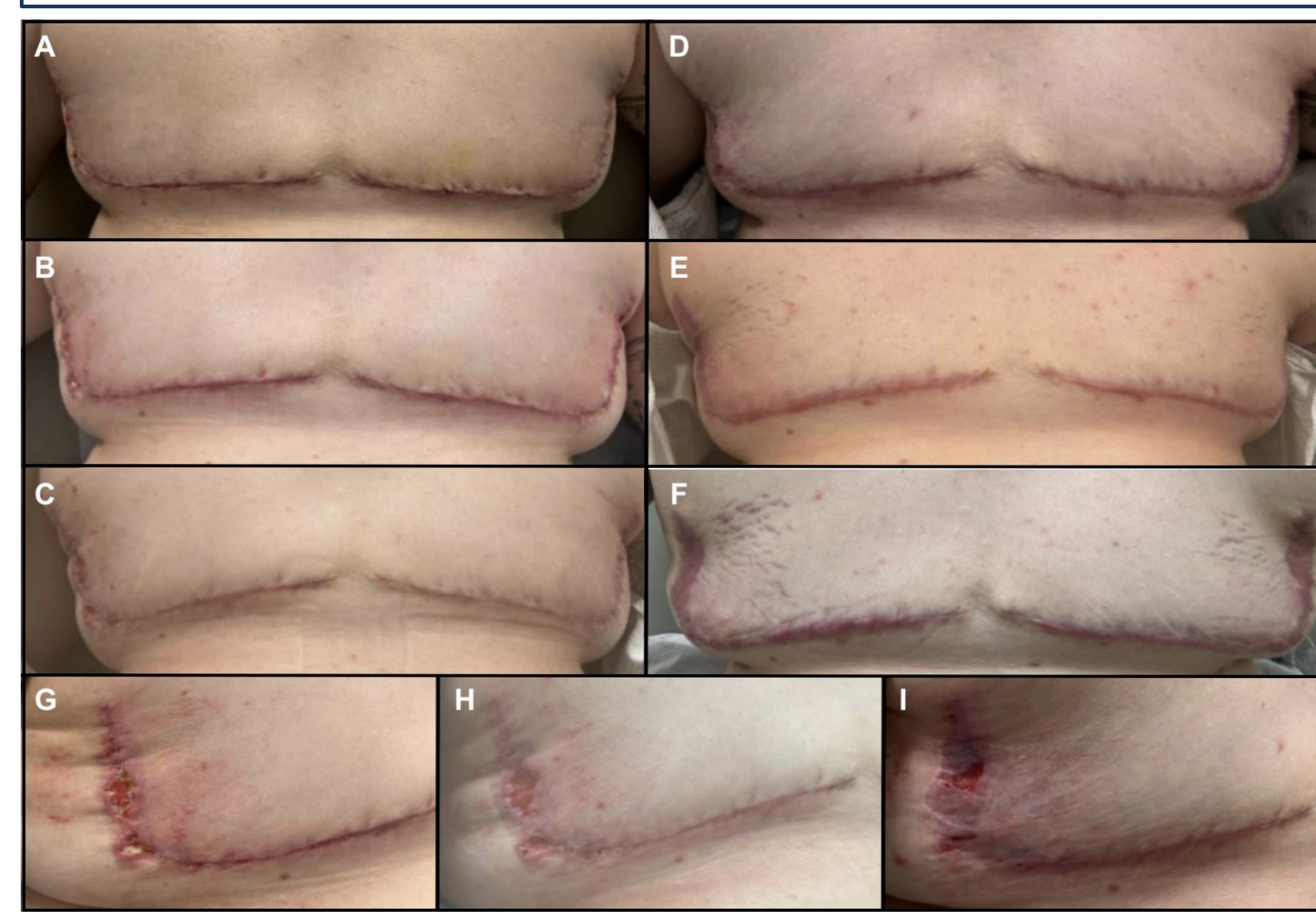


Figure 3 (above). Timeline of Outcomes
This timeline demonstrates an outline of when each new postoperative outcome was first noted by the clinical team for a TGNB patient with EDS following chest masculinization surgery. The break in the timeline between 3 months and 7 months represents a time block where no new complications or outcomes were noted.



Figure 4 (right). Tissue Redundancy Development Over Time and Outcome of Revision Surgery for Excess Tissue
Postoperative images of CMS results for one patient (A) 5 weeks and (B) 7 months postoperatively, following the initial surgery. The red circles highlight areas of tissue redundancy over time. Due to the development of tissue redundancy, the patient opted to undergo a second surgery to remove excess tissue. The bottom half of the image shows the results of the revision surgery (C) 1 month and (D) 1 year postop.

A total of 28.6% (n=4) of EDS patients underwent CMS revision surgery for excess tissue removal compared to 7.9% (n=7) of patients without EDS.

Conclusion

- No EDS patients experienced intraoperative or major postoperative complications
 - CMS remains a safe and effective procedure in patients with EDS
- Dehiscence and infection: noted 1-2 months post-CMS; skin redundancy: noted 2-7 months later
- No significant difference in occurrence of postop skin redundancy, scar widening, or infection, yet EDS patients were *significantly more likely* to require interventions such as revision surgery for excess skin and wound washout or debridement
 - While EDS may not increase occurrence of wound healing or aesthetic concerns, it may increase severity of these concerns, necessitating intervention; EDS patients should be counseled accordingly during preoperative consultation for CMS
 - Surgical planning: incisional reinforcement should be considered; extra care should be taken in postoperative monitoring and wound management