

Modiolus-based Dynamic Reconstruction For Transverse Facial Cleft: A Retrospective Cohort Study

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Objectives

Transverse facial cleft is a rare congenital craniofacial anomaly that significantly impacts both aesthetic appearance and functional integrity of the oral commissure. Current surgical techniques demonstrate suboptimal efficacy in restoring commissural morphology and facial symmetry. To further optimize surgical outcomes, we enhanced the conventional approach by incorporating anatomical reconstruction of the modiolus and orbicularis oris, and evaluated its long-term aesthetic outcomes in the symmetry of commissure compared with conventional methods.

Methods

This single-center cohort study retrospectively analyzed 20 patients who underwent unilateral transverse facial cleft repair between May 2015 and October 2023.

The cohort comprised two groups:

- (1) conventional repair group (n=9) and
- (2) priority modiolus reconstruction group (n=11).

Objective anthropometric measurements were obtained at preoperative, immediate postoperative, and long-term follow-up stages. Subjective evaluations were performed using Face-Q and Visual Analog Scale (VAS) questionnaires.

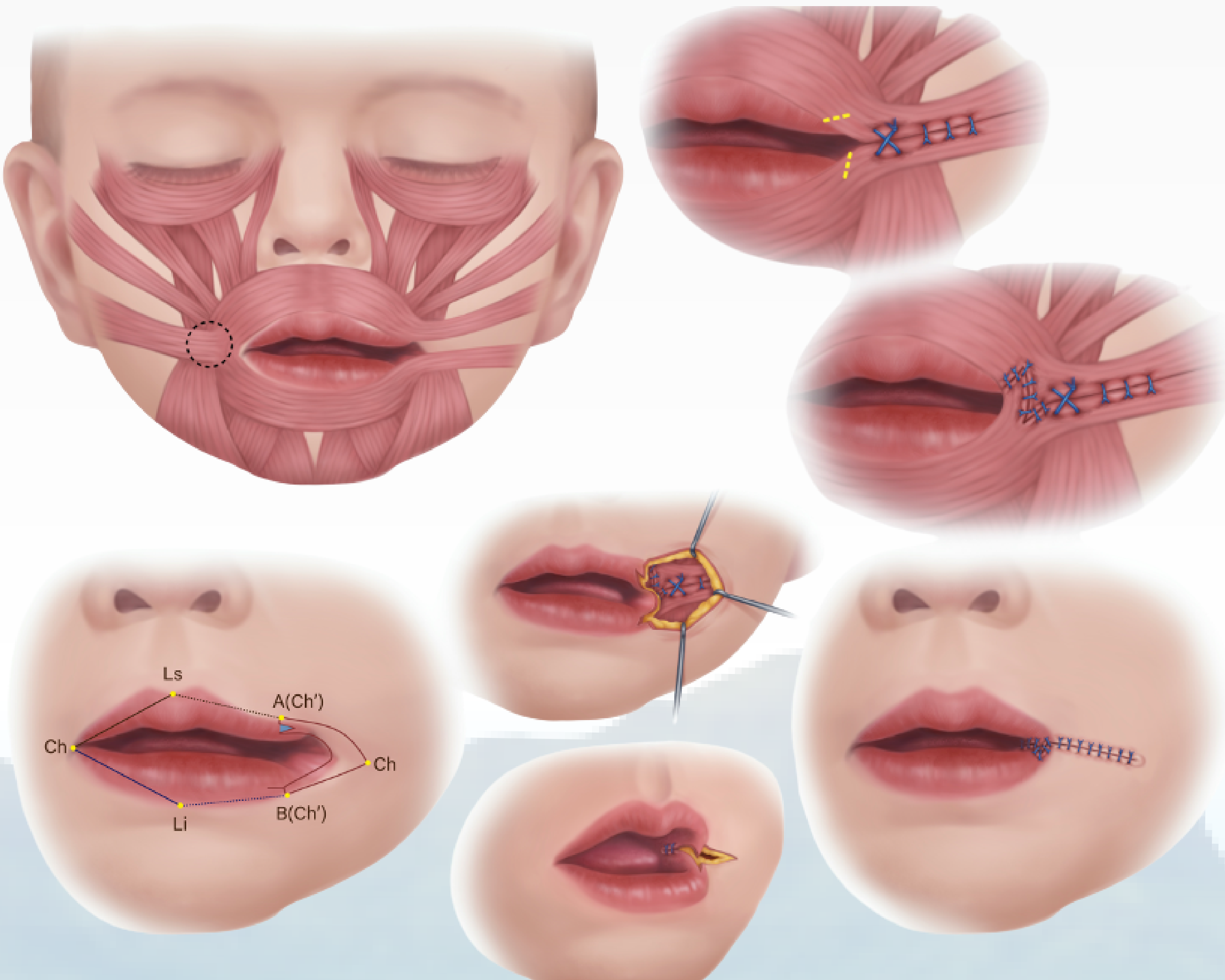


Fig1. Modiolus-based dynamic reconstruction for transverse facial cleft.

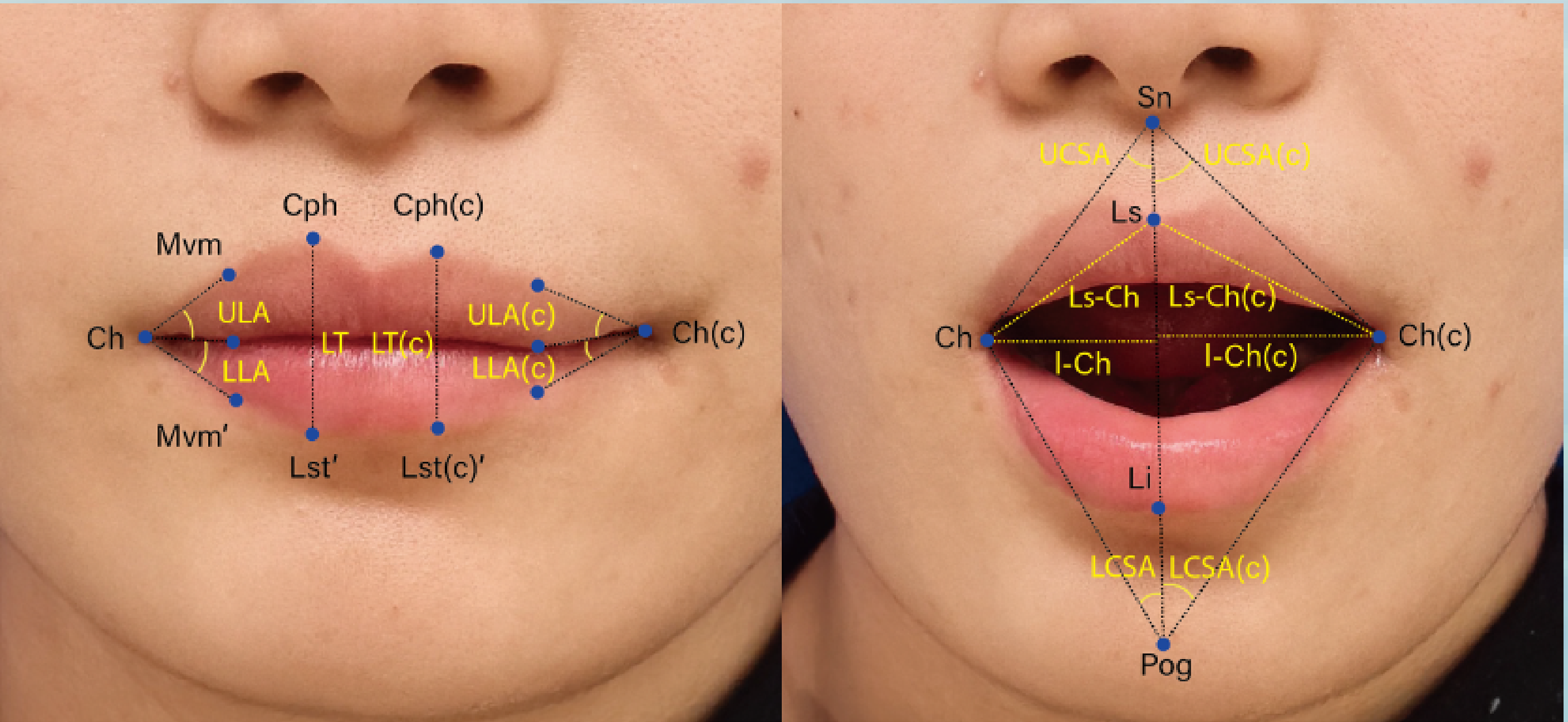


Figure 2. Schematic illustration of lip anthropometric measurements.

Results

Immediate postoperative assessment revealed significant improvement in the lower cheilion spread angle (Δ LCSA) in the modiolus reconstruction group compared to controls (8.22 ± 5.43 vs. 3.67 ± 2.99 , $p=0.045$). Long-term follow-up demonstrated statistically significant differences in four key perioral measurements: Δ UCSA (10.04 ± 6.83 vs. 4.56 ± 1.78 , $p=0.046$), Δ LCSA (9.47 ± 5.19 vs. 3.94 ± 2.78 , $p=0.014$), Δ Ls-Ch (9.75 ± 5.91 vs. 3.82 ± 1.95 , $p=0.004$) and Δ I-Ch (10.59 ± 5.41 vs. 3.89 ± 3.32 , $p=0.006$), indicating enhanced commissural symmetry, particularly during mouthopening. Professional evaluation using VAS for commissural symmetry were also significantly higher in the reconstruction group at long-term follow-up (7.78 ± 0.75 vs. 8.45 ± 0.58 , $p=0.042$).

Conclusion

In patients with unilateral transverse facial cleft, priority modiolus reconstruction effectively improves both static and dynamic symmetry of commissure compared with conventional repair, with maintained long-term outcomes.

