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INTRODUCTION

Children with unilateral vocal cord immobility (VCI) after cardiac surgery frequently develop swallowing dysfunction. Potential for spontaneous recovery often leads to pursuit of temporary interventions to minimize dysphagia. The benefit of injection laryngoplasty (IL) beyond conservative management remains poorly understood.

PURPOSE

To compare pre- and post-procedure flexible fiberoptic laryngoscopies (FFL) and video fluoroscopic swallow studies (VFSS) for children with unilateral VCI after cardiac surgery undergoing IL versus observation.

METHODS

A retrospective case control study included consecutive children <18 years old between 2012 and 2022 at Children's Medical Center with VCI after cardiac surgery. Included children had unilateral VCI and a history of major cardiac surgery with 2 or more VFSS over time to document objective improvement in dysphagia. Children without any pre- or post-procedure VFSS were excluded.

The intervention group had a direct laryngoscopy with vocal cord medialization by IL. The control group did not have an IL.

The primary objective compared rates of aspiration resolution and secondary objectives assessed time to resolution of aspiration on swallow study, liberation of diet, and liberation of G tube dependence.

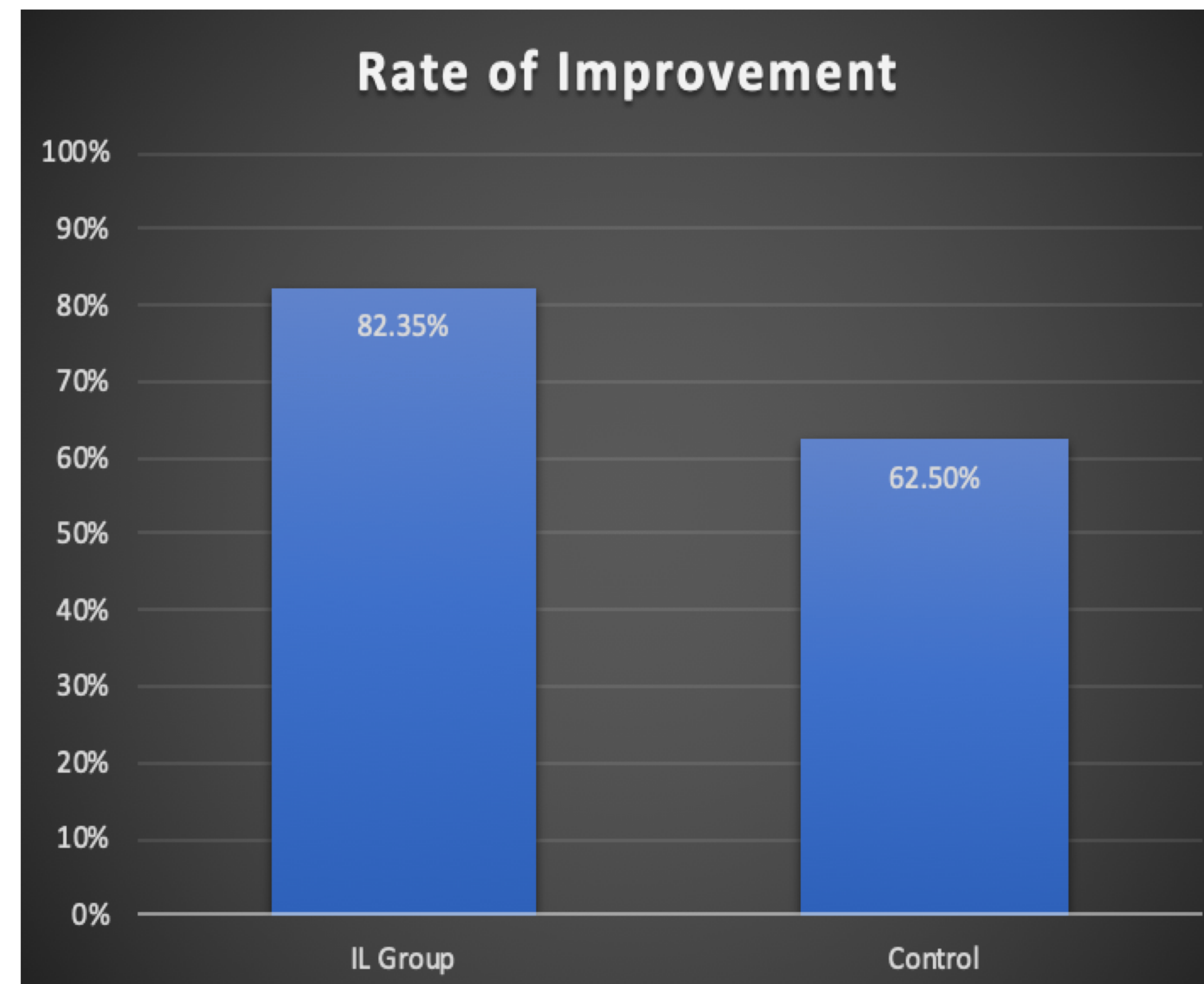


Figure 1. Improvement Rates of Aspiration

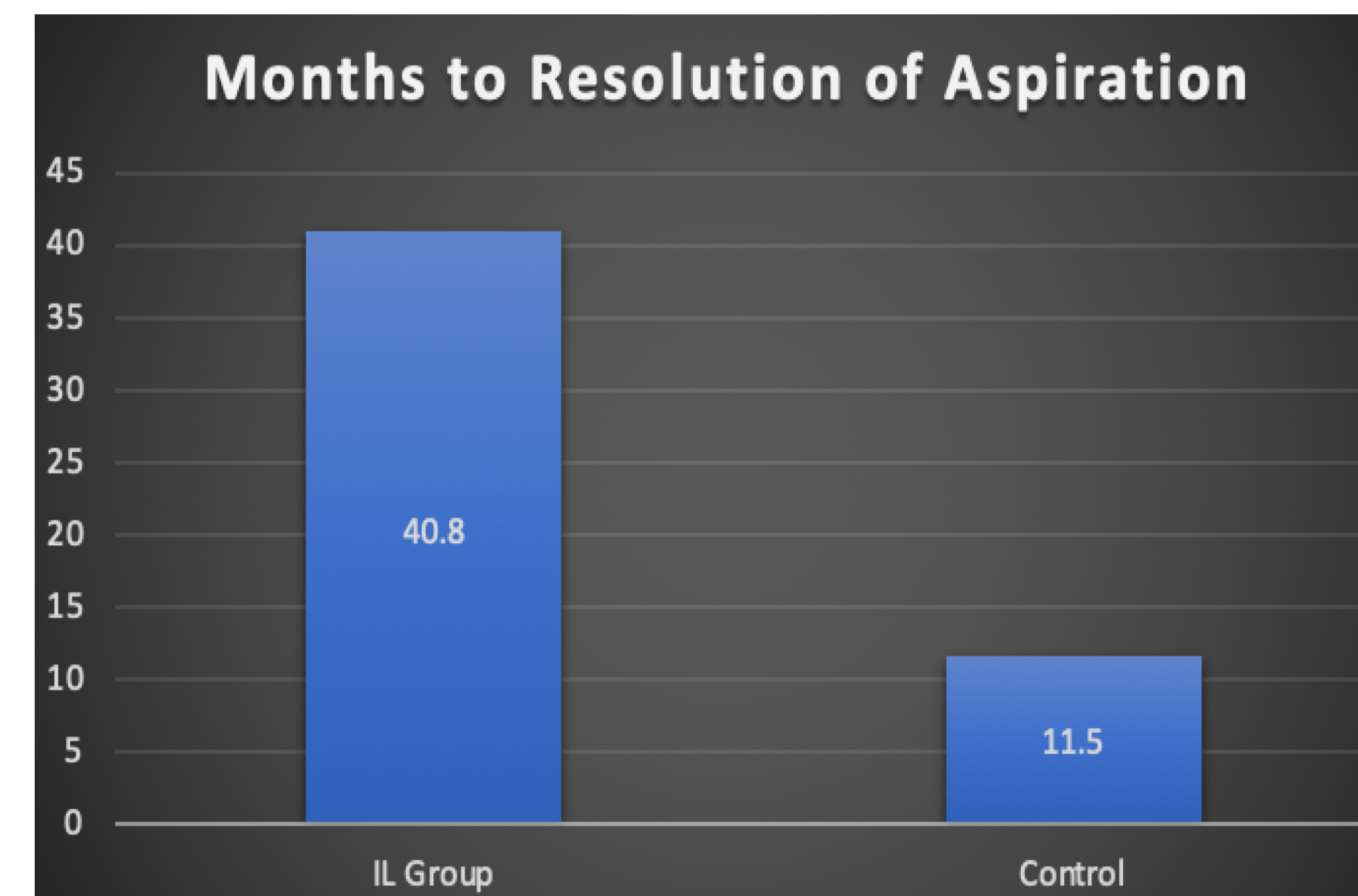


Figure 2. Time from Onset of VCI to Improvement

RESULTS

- Mean age at cardiac surgery was 4.6 months (SD: 10.3)
- 17 children obtained IL at 29.0 months (SD: 17.8)
- Dysphagia improvement in the injection group was 14/17 (82%) and 10/16 (63%) for the control group (Figure 1) ($P=.26$).
- Time resolution of aspiration on VFSS from the initial diagnosis of VCI was 11.5 months (SD: 11.8) for the control group and 40.8 months (SD: 24.4) for the injection group with (Figure 2) ($P=0.001$).
- No intraoperative or postoperative complications with IL were documented. There were also no documented long-term sequelae.

CONCLUSIONS

- IL can potentially provide improvement in objective swallowing outcomes while having a low rate of complications.
- Rates of aspiration resolution were no different, but an additional procedure may result in longer time to instrumental assessments.
- This study did not find any long-term adverse effects in patients receiving repetitive injections, which was previously not studied.
- This is the largest retrospective case series to date with 33 total patients split into a control and intervention group. However, it is still limited by a small sample size.
- The IL group showed higher rates of improvement that may be significant with a higher number of patients.

REFERENCES

- Orzell S, Joseph R, Ongkasuwan J, Bedwell J, Shin J, Raol N. Outcomes of Vocal Fold Motion Impairment and Dysphagia after Pediatric Cardiothoracic Surgery: A Systematic Review. *Otolaryngol Head Neck Surg.* 2019;161(5):754-763. doi:10.1177/0194599819858594
- Meister KD, Johnson A, Sidell DR. Injection Laryngoplasty for Children with Unilateral Vocal Fold Paralysis: Procedural Limitations and Swallow Outcomes. *Otolaryngol Head Neck Surg.* 2019;160(3):540-545. doi:10.1177/0194599818813002
- Ayoub N, Balakrishnan K, Meister K, et al. Safety and effectiveness of vocal fold injection laryngoplasty in infants less than one year of age. *Int J Pediatr Otorhinolaryngol.* 2023;168:111542. doi:10.1016/j.ijporl.2023.111542
- Bertelsen C, Jacobson L, Osterbauer B, Hochstim C. Safety and efficacy of Early injection laryngoplasty in pediatric patients. *Laryngoscope.* 2019;129(7):1699-1705. doi:10.1002/lary.27436