

Buccal Epithelium Hashed and Encapsulated in Scaffold-Hybrid Approach to Urethral Stricture (BHES-HAUS) – Preliminary Outcomes of Clinical Trial

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INTRODUCTION

- Urethral stricture affects men of all ages with **high recurrence rate** following minimally invasive interventions.
- Balloon dilatation, with or without drug coating or urethrotomy (DVIU) **leave a raw area at the stricture site without epithelial coverage**, exposing it to urine, triggering inflammation, myofibroblast activation, scarring, and disease recurrence[#].
- Cell therapy approaches using buccal epithelial cells, both in vitro cultivated BEES-HAUS in two-steps and minced tissue transplant in one-step have shown promise.
- We report the outcome of a simplified method: **BHES-HAUS** (Buccal Epithelium Hashed and Encapsulated in Scaffold-Hybrid Approach) using **Festigel** (Free-from- Excess Endotoxin-Scaffold of Thermo-responsive Intelli-GEL).

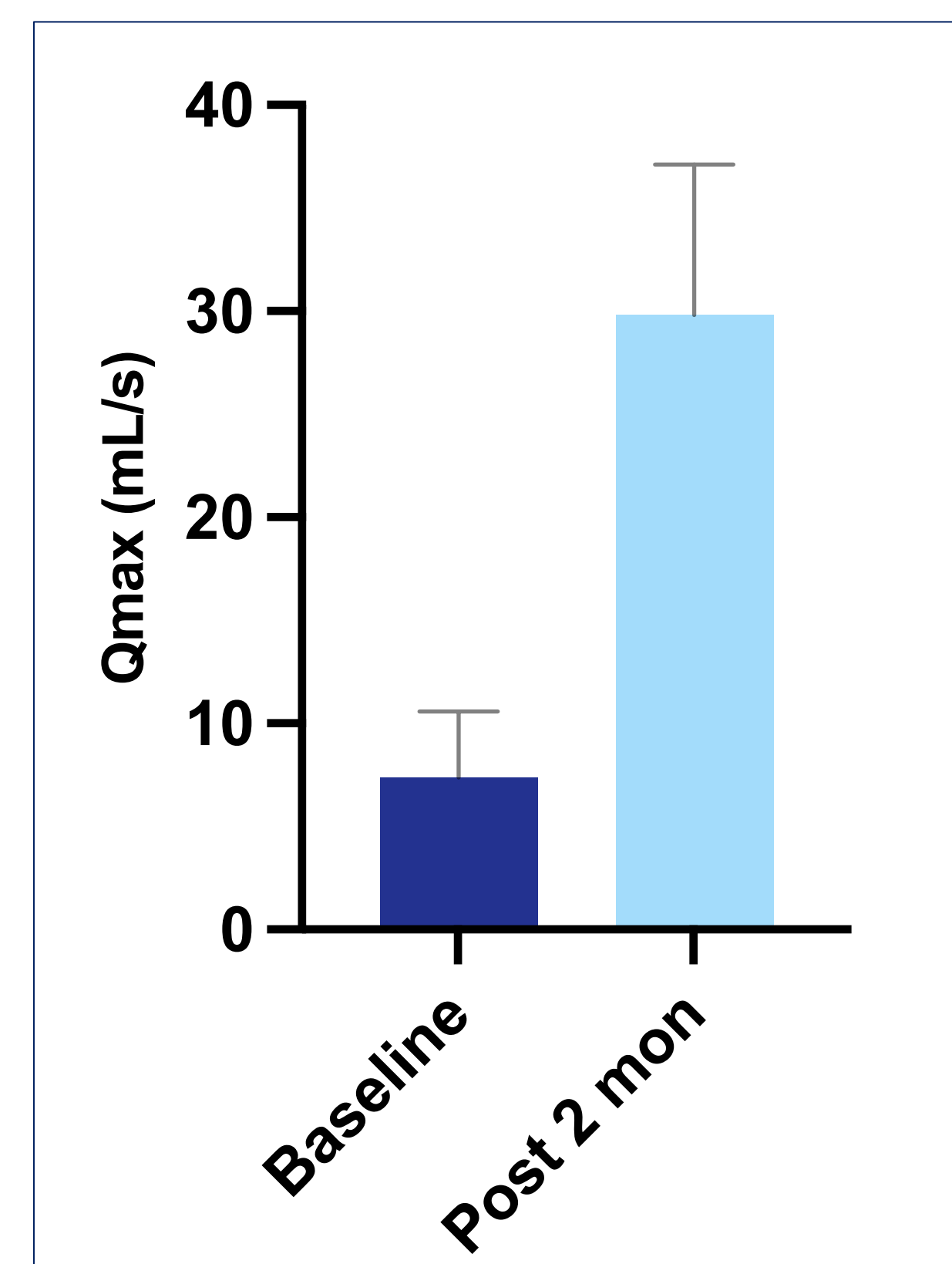
PRELIMINARY RESULTS

Two-months Q-Max & IPSS

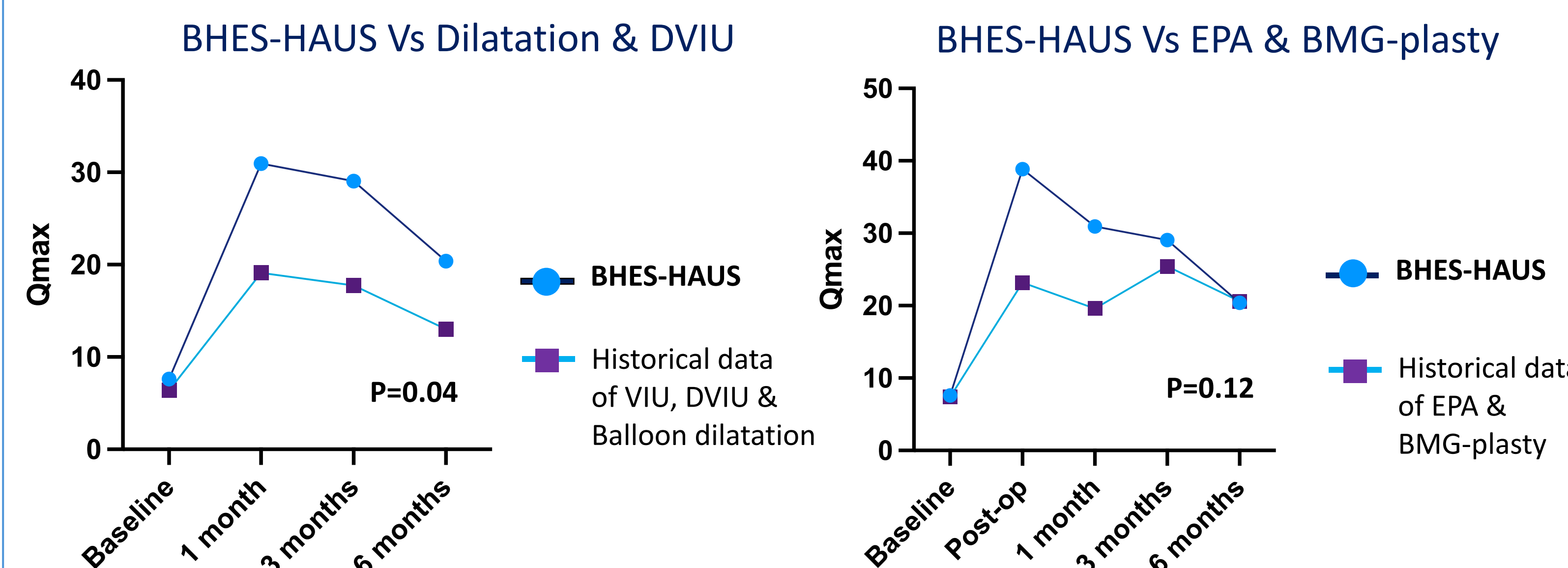
In UFM, the Mean-Q-Max improved:

From 7.39 ± 3.19 mL/s @ baseline
 >> 35.3 ± 10.5 mL/s, @ 21 days
 >> 36.6 ± 14.4 mL/s, @ 1 month (n=3)
 >> 29.8 ± 7.3 mL/s @ 2 months (n=3).

IPSS @ baseline 10-22 (mod~severe)
 >> improved to 3-7 (mild) @1 month

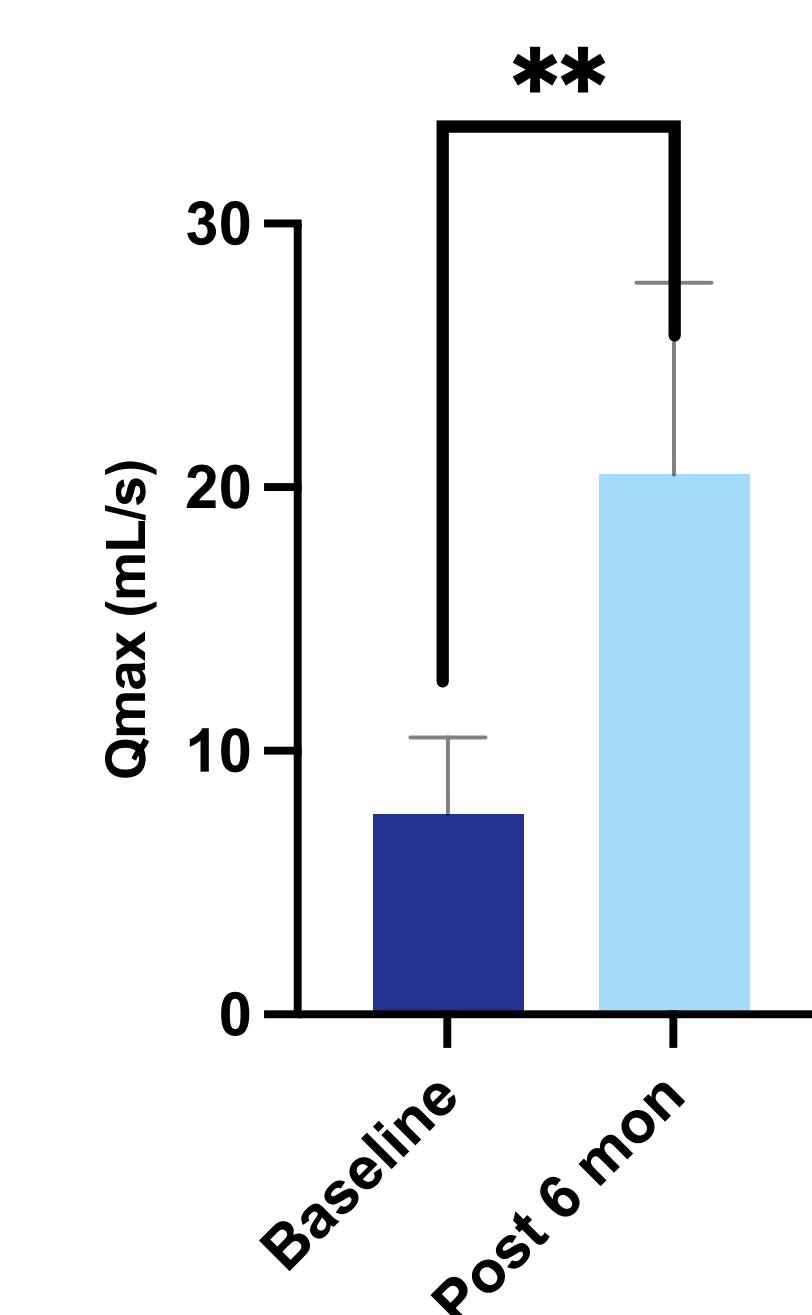


Qmax in BHES-HAUS Vs Historical data*

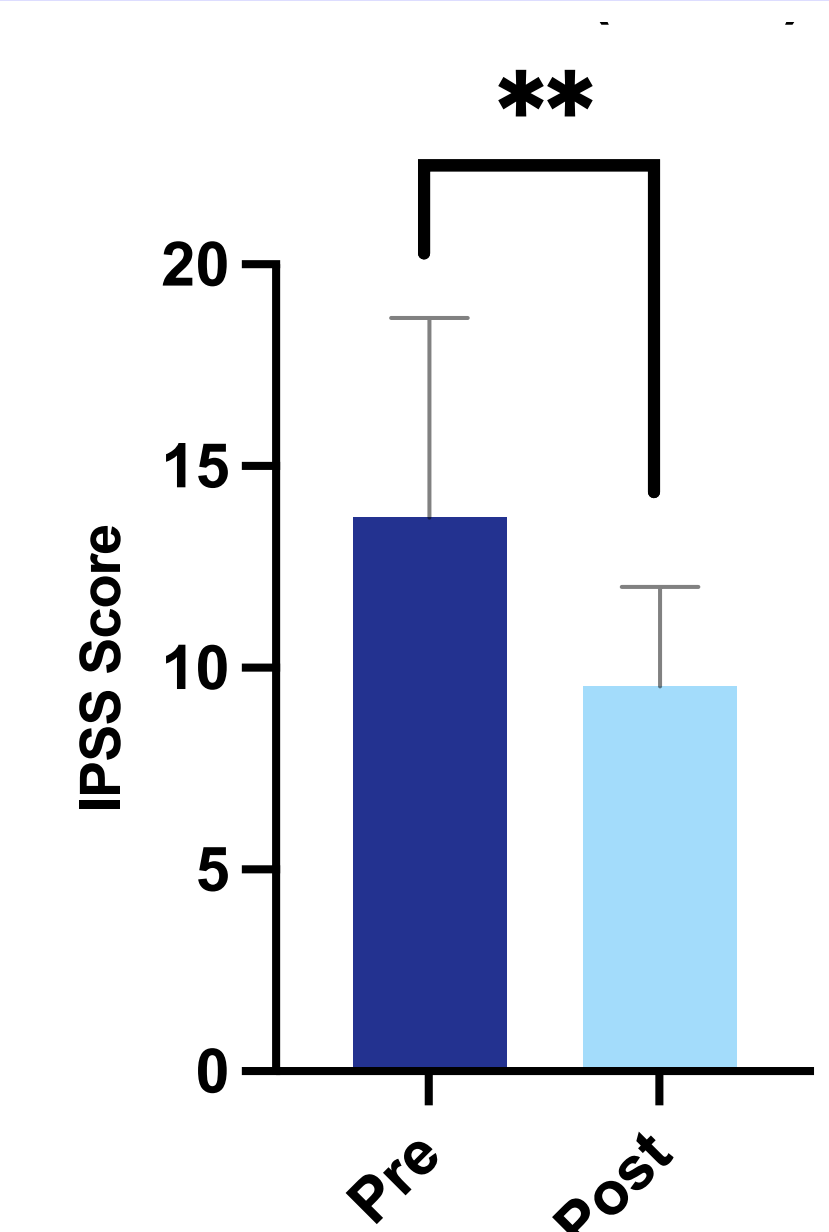


LATEST FOLLOW-UP RESULTS (SIX-MONTHS)**

Q-Max (n=11)



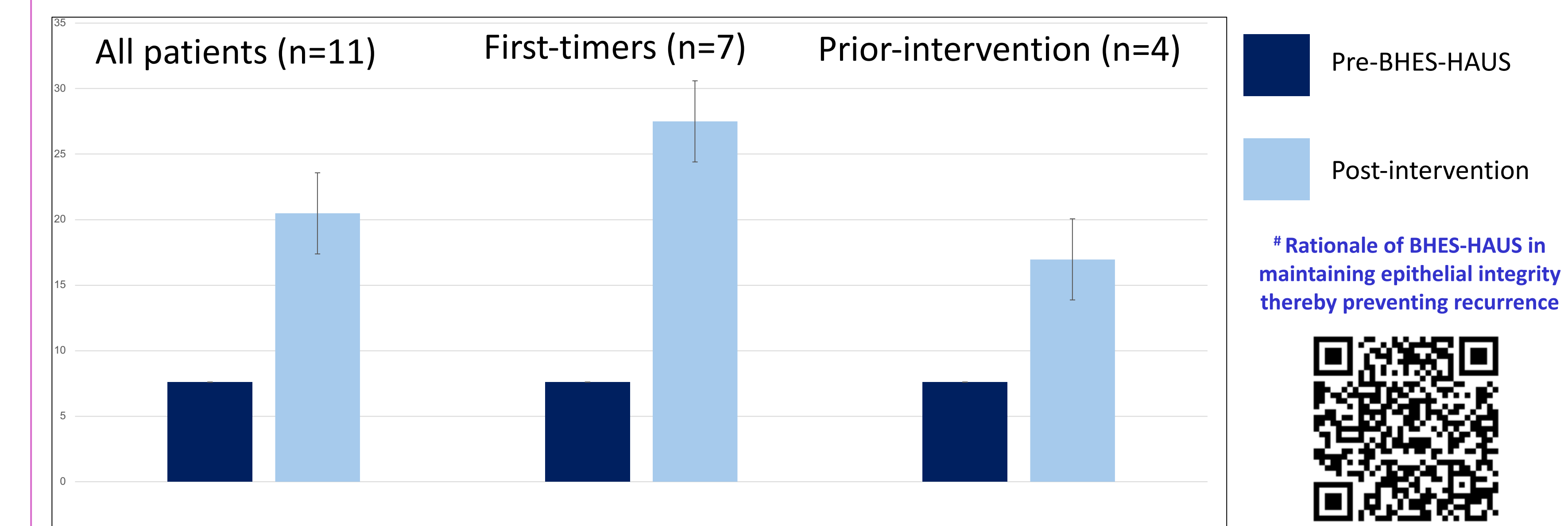
IPSS (n=11)



Among the total 15 patients, BHES-HAUS yielded successful outcome at 6 months in 11 patients, including those with post BMG-plasty & post-TURP stricture. Patients with mod~severe IPSS and/or Qmax <15 mL/s underwent calibration & inability to pass 14Fr catheter were considered as failure.

Increase in Qmax between baseline and 6 months follow-up was significant (p=0.0002)

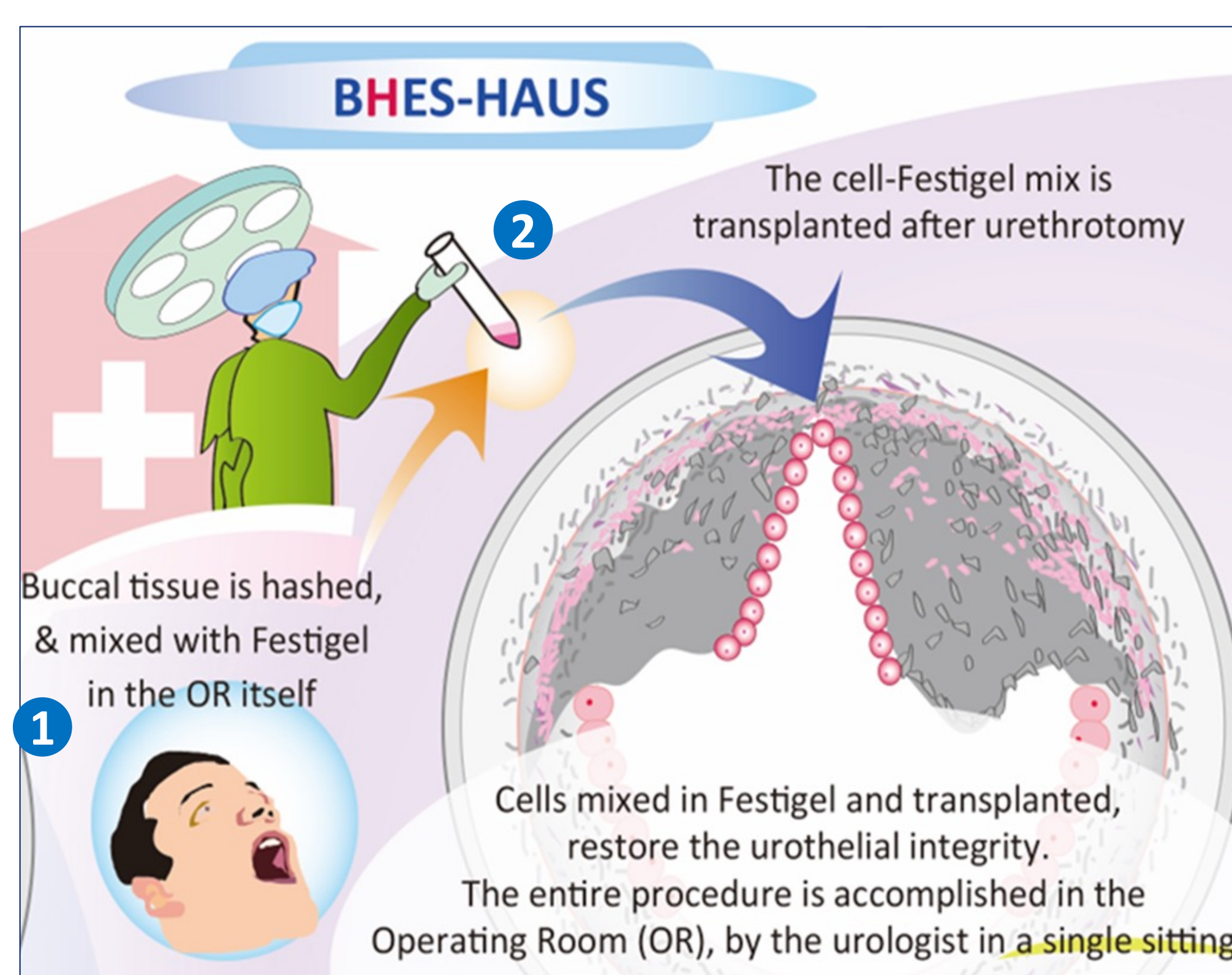
Q-Max comparison: with vs without prior intervention



*Rationale of BHES-HAUS in maintaining epithelial integrity thereby preventing recurrence



METHODS



- Patients with urethral stricture length < 2 cm (n=15) were enrolled.
- (1) Buccal mucosa (1x1cm) was harvested, defatted, hashed finely, centrifuged, and suspended in Festigel (Tissue-scaffold mixture).
- (2) After DVIU and placing 14 Fr Foley catheter, the tissue-scaffold mixture was transplanted at the urethrotomy site under vision, through 17 Fr cystoscope inserted beside the catheter. Catheter was removed on postoperative day 21.
- Follow-up by IPSS score & Uroflowmetry (UFM).

CONCLUSION (**Including six-months outcome)

- Qmax after BHES-HAUS increased significantly from 7.62 ± 2.88 mL/s at baseline to 28.90 ± 9.89 mL/s at 3 months and 20.48 ± 7.2 mL/s at 6 months.
- Yielded better Qmax (27.5 ± 9.1 mL/s) in patients who underwent BHES-HAUS for the first time (n=7) compared to those who had undergone prior interventions (n=4) (16.98 ± 3.34 mL/s).
- High Neutrophil to Lymphocyte Ratio (NLR) >2, correlated with poorer Qmax outcome.
- BHES-HAUS yielded significantly better outcome* than VIU or DVIU or balloon dilatation (p=0.04) at 6-months & comparable with EPA & BMG-plasty (p=0.12).

- BHES-HAUS was safe and feasible in all patients and was successful in 73.3% @ 6 months.
- NLR is a biomarker worth considering for patient selection & prediction after validation.

Conflict of interests: Author Samuel JK Abraham is a shareholder in GN Corporation Co. Ltd., Japan and is an applicant /inventor to several patents on biomaterials and cell culture technologies.

Illustration from: <https://doi.org/10.3389/fbioe.2025.1687741>; for explanation only. Engraftment of cells documented pre-clinically and clinically in BEES-HAUS procedure reported earlier; Not yet documented in this BHES-HAUS study.

*Vyas JB et al. Urol Ann. 2013;5(4):245-248. Li X et al. BMJ Open. 2024;14(2):e071923. Akkoc A et al. Int Braz J Urol. 2016;42(2):356-364. Tinaut-Ranera J et al. Can Urol Assoc J. 2014;8(1-2):E16-E19. Zheng X et al. World J Urol. 2019;37(12):2785-2793. Azab SS Scand J Urol. 2020;54(6):431-437. Chi J et al. Int J Surg. 2024;110(7):4382-4392. Noureldin YA et al. Arab J Urol. 2021;19(4):473-479. Babelay G et al. Cureus. 2024;16(12). Kumar N et al. Cureus. 2024;16(3):e55732. Tyagi et al. World J Urol. 2022;40(2):475-481. Vaddi S et al. Bladder 2025; In print.