

Ultrasound Evaluation and Grading of Varicoceles: Clinical Audit

I. Abuelbeh¹, R. Mehra¹, L. Robenson¹, V. Nadarajah¹, I. Pearce¹, V. Modgil¹

¹ Manchester University NHS Foundation Trust

INTRODUCTION

- **Varicoceles** are a common urological problem representing the commonest, potentially correctable, cause of male infertility.¹
- **Ultrasound (US)** is the imaging modality of choice for accurate diagnosis and evaluation of varicoceles.
- Of the several grading systems utilised in the assessment of varicoceles, the **Sarteschi classification** is the one favoured by the European Society of Urogenital Radiology Scrotal and Penile Imaging Working Group (ESUR-SPIWG).^{2,3}
- The Sarteschi grading system includes **five grades** based on the presence or absence of venous reflux (as triggered by the valsalva manoeuvre) during supine and erect positions at 3 anatomical areas: inguinal, suprastesticular and peritesticular.
- **Evaluation for reflux is critical in the diagnosis of varicocele and prediction of treatment outcomes.** A reflux that lasts more than 2 second triggered by valsalva is strongly associated with postoperative improvement in semen quality.³
- ESUR-SPIWG's recently published guideline sought to provide evidence-based recommendations for standardising the technique and interpretation of ultrasound examinations.⁴

AIM

In improving current practice within Manchester Foundation Trust, this audit sought to introduce a targeted intervention to align sonographic reporting with the latest guidelines. Through standardising practice, the project sought to enhance varicocele evaluation ultimately streamlining urological triage and improving patient outcomes.

COMPARATIVE STANDARD

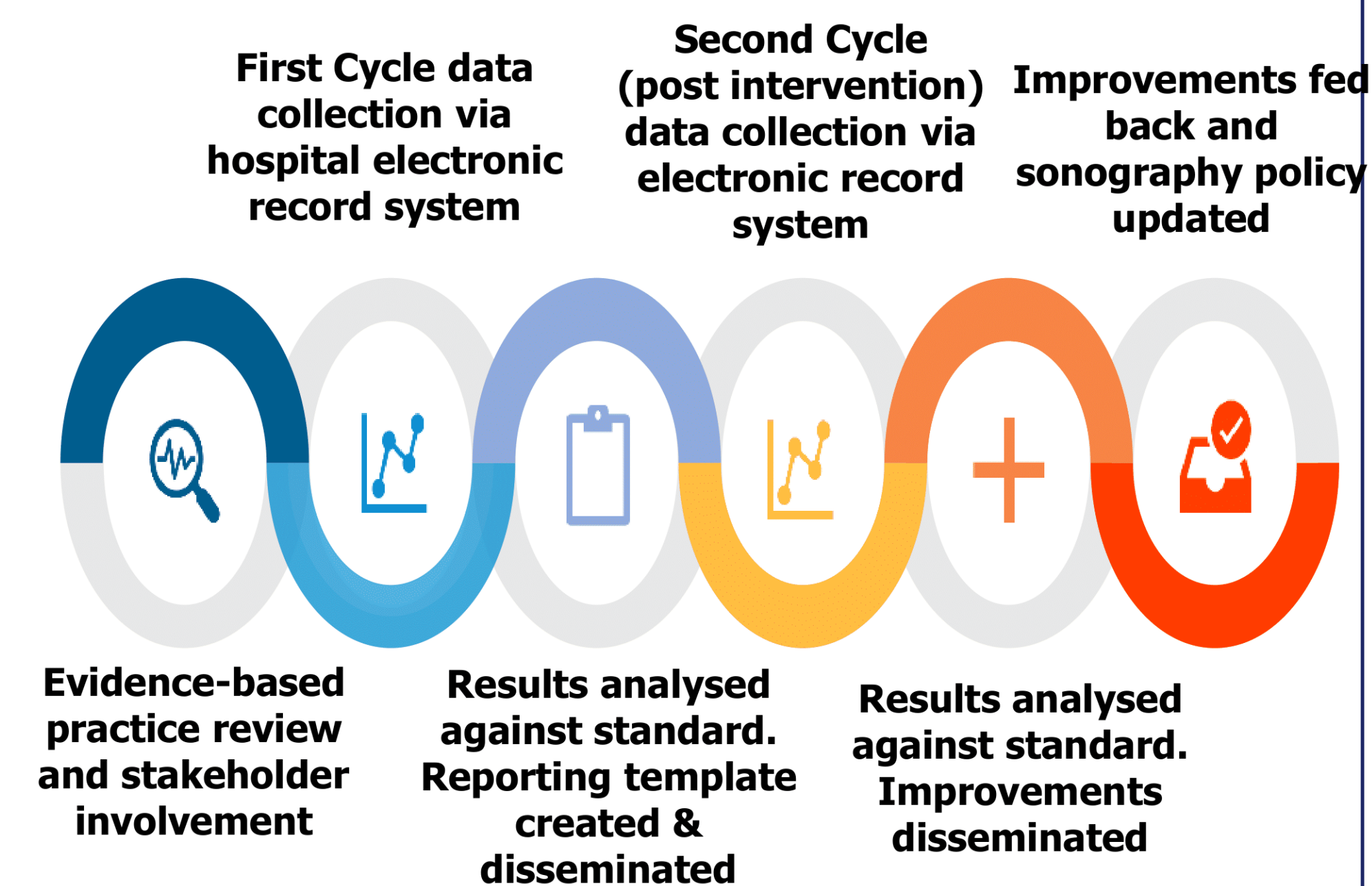
As per ESUR-SPIWG guidelines, all reports should include:

- Testicular volume which should be measured using Lambert's formula: ($l*w*h*0.71$)
- The location (inguinal, suprastesticular or peritesticular) and the diameter of the largest vein when supine & erect
- The level (inguinal, suprastesticular or peritesticular) and venous reflux in supine and erect positions.

REPORTING TEMPLATE



METHOD



RESULTS

Two audit cycles of successive testicular US reports (including varicocele identification) were undertaken pre- and post-intervention (1st cycle n=30, 2nd cycle n=36) between January and October 2024.

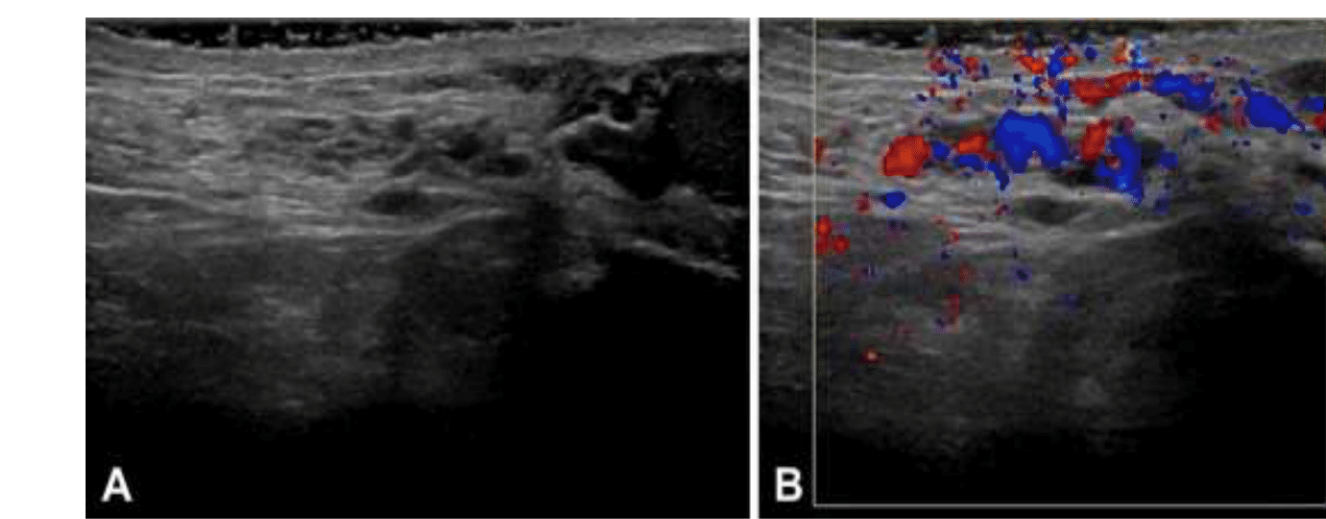


Figure 1: Example Sarteschi Grade 1 Varicocele (reflux in the vessels of the inguinal canal seen only during the Valsalva manoeuvre without any visible reflux during standard ultrasound examination).⁵

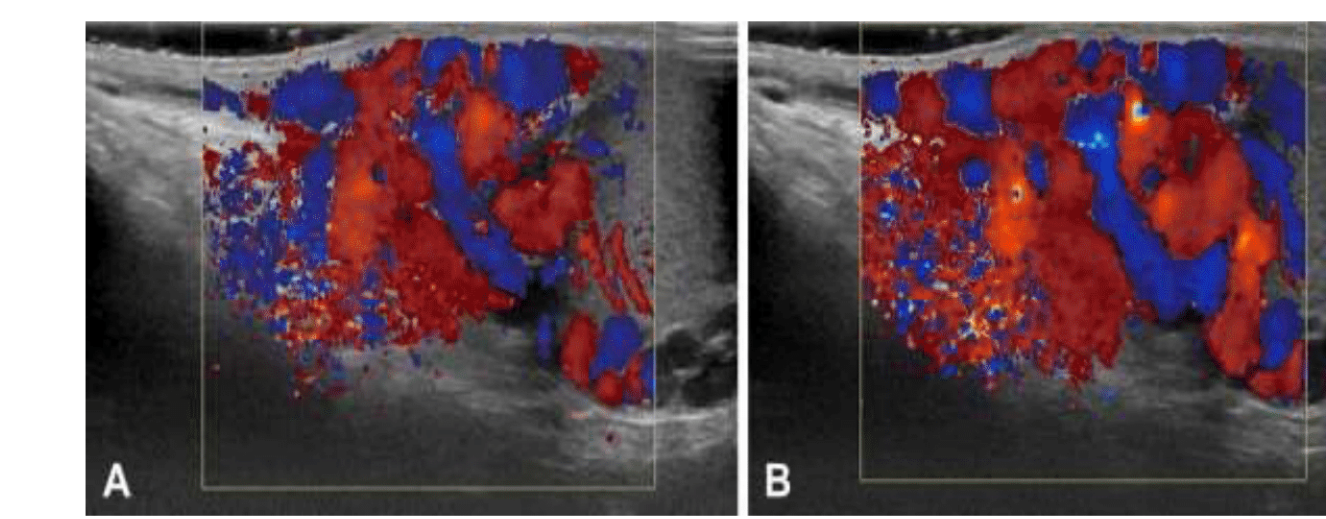
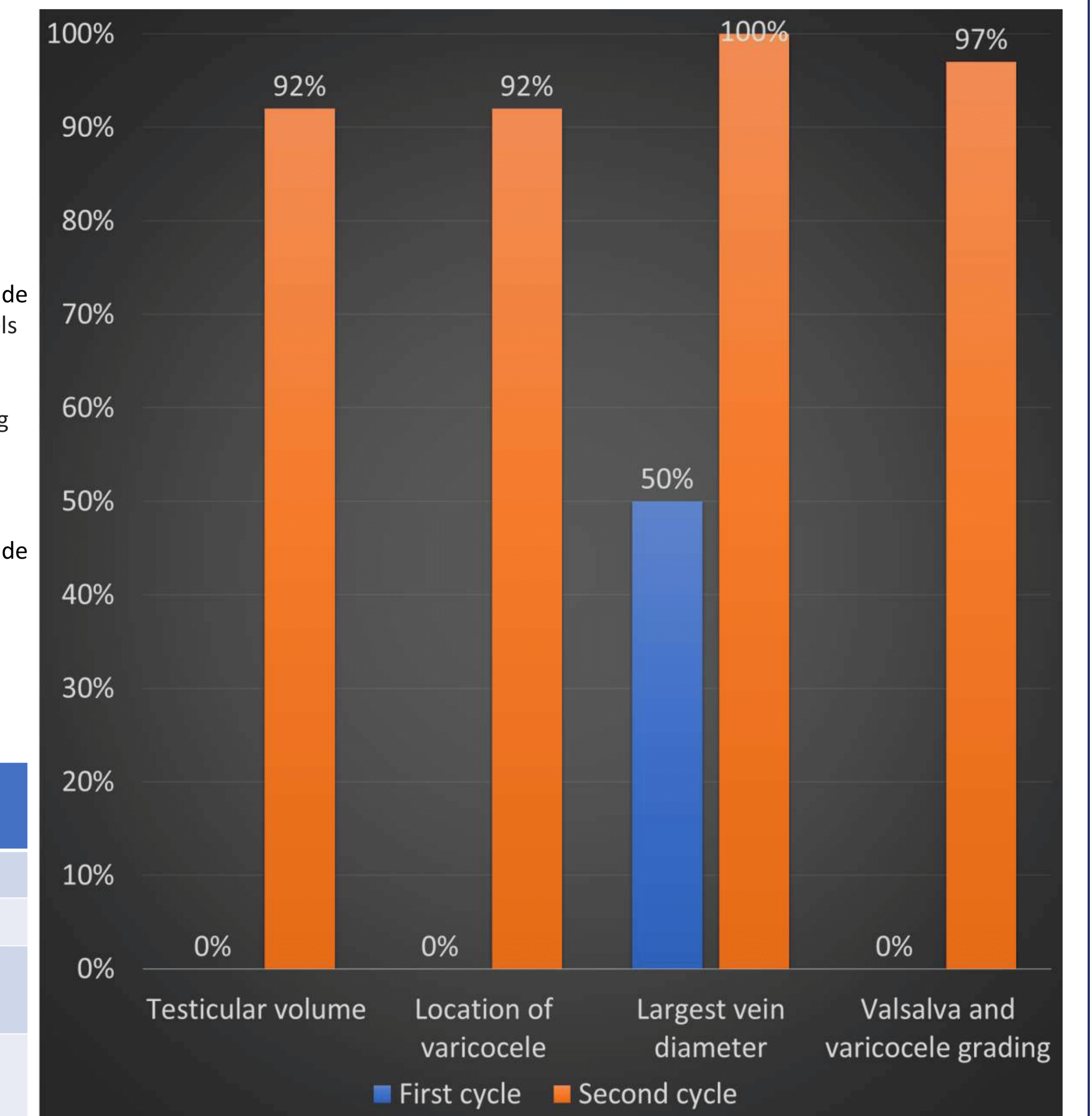


Figure 2: Example Sarteschi Grade 3 Varicocele (Enlarged vessels whose caliber increases during the Valsalva maneuver).⁵

	First cycle (n=30)	Second cycle (n=36)
Testicular volume	0	33
Location	0	33
Largest vein diameter	15	36
Valsalva and varicocele grading	0	35



CONCLUSIONS

- The first cycle revealed minimal compliance, omitting key details required for effective report utilisation.
- As seen within the second cycle, our purpose-built template, developed through stakeholder input, local requirements, and best practice guidelines, markedly improved reporting.
- Stakeholder collaboration addressed concerns about extended templates, including increased variability, scan length, operator/patient discomfort, and training needs.
- Balancing guideline adherence, sonographer preferences, and urology service requirements, our template is acceptable and now available for wider departmental use.
- Future research could explore the impact of streamlined triage on patient outcomes in subfertility care.

REFERENCES

1. Łukasz Kupis, P. Dobroński and Radziszewski, P. (2015). Varicocele as a source of male infertility – current treatment techniques. *Central European Journal of Urology*, 68(3). doi:https://doi.org/10.5173/cej.2015.642.
2. Bertolotto, M., Cantisani, V., Drudi, F.M. and Lotti, F. (2021). Varicocele. Classification and pitfalls. *Andrology*, 9(5), pp.1322–1330. doi:https://doi.org/10.1111/andr.13053.
3. Bertolotto, M., Freeman, S., Richenberg, J., Belfield, J., Dogra, V., Huang, D.Y., Lotti, F., Markiet, K., Nikolic, O., Ramanathan, S., Ramchandani, P., Rocher, L., Secil, M., Sidhu, P.S., Skrobisz, K., Studniarek, M., Tsili, A., Turgut, A.T., Pavlica, P. and Derchi, L.E. (2020). Ultrasound evaluation of varicoceles: systematic literature review and rationale of the ESUR-SPIWG Guidelines and Recommendations. *Journal of Ultrasound*, 23(4), pp.487–507. doi:https://doi.org/10.1007/s40477-020-00509-z.
4. Freeman, S., Bertolotto, M., Richenberg, J., Belfield, J., Dogra, V., Huang, D.Y., Lotti, F., Markiet, K., Nikolic, O., Ramanathan, S., Ramchandani, P., Rocher, L., Secil, M., Sidhu, P.S., Skrobisz, K., Studniarek, M., Tsili, A., Tuncay Turgut, A., Pavlica, P. and Derchi, L.E. (2019). Ultrasound evaluation of varicoceles: guidelines and recommendations of the European Society of Urogenital Radiology Scrotal and Penile Imaging Working Group (ESUR-SPIWG) for detection, classification, and grading. *European Radiology*, 30(1), pp.11–25. doi:https://doi.org/10.1007/s00330-019-06280-y.
5. Pauroso, S., Di Leo, N., Fulle, I., Di Segni, M., Alessi, S. and Maggini, E. (2011). Varicocele: Ultrasonographic assessment in daily clinical practice. *Journal of Ultrasound*, 14(4), pp.199–204. doi:https://doi.org/10.1016/j.jus.2011.08.001.