



Critical appraisal of transperineal Doppler ultrasound as a diagnostic tool for hemorrhoidal recurrence

Michele Schiano di Visconte¹

Accepted: 13 May 2025
© The Author(s) 2025

Dear Editor,

We read with considerable interest the recent pilot study by Gravante et al., titled *Assessment of long-term outcomes following Milligan-Morgan hemorrhoidectomy with Doppler transperineal ultrasound and endoscopy: a pilot study*, which explored the use of transperineal ultrasound (TPUS) as a modality for identifying internal recurrences of hemorrhoidal disease (HD) following Milligan-Morgan (MM) hemorrhoidectomy [1]. Although this study introduced an innovative proctologic application of TPUS, several critical aspects of its findings require further discussion to refine their interpretation and clinical implications.

First, the small sample size (23 of 90 eligible patients) raised concerns regarding selection bias. The authors did not provide detailed information regarding the characteristics of non-participating patients, which restricts the ability to ascertain whether the study sample is truly representative of the broader population treated with MM. Without understanding the reasons for non-participation, potential systematic differences between participants and non-participants cannot be excluded, possibly skewing the observed associations. Consequently, the reported 100% negative predictive value (NPV), while notable, is accompanied by a wide 95% confidence interval (63.1–100%), reflecting the statistical uncertainty inherent in small sample sizes and warranting caution in generalizing these results beyond this pilot cohort. Furthermore, a positive predictive value (PPV) of only 66.7% for the “vascular” pattern suggests that if TPUS is the sole diagnostic tool, approximately one-third of the patients with this pattern might undergo unnecessary further investigations.

Second, the absence of baseline (preoperative) TPUS data significantly hinders the interpretability of the postoperative findings. Without preoperative imaging, it is challenging to determine whether the observed postoperative vascular patterns resulting from surgery are natural anatomical variations or indicate chronic remodeling unrelated to recurrence [2]. The absence of a longitudinal assessment significantly hinders attributing Doppler signal findings definitively to disease recurrence rather than pre-existing characteristics or postoperative sequelae. Future research should be substantially strengthened by longitudinal designs incorporating both pre- and post-operative TPUS assessments.

Third, the classification of Doppler signals into binary “vascular” and “scattered” patterns is described as a qualitative, operator-dependent visual assessment [3]. Although illustrative, this approach lacks objectivity and may be prone to interobserver variability. The inclusion of quantitative Doppler metrics such as peak systolic velocity, resistive index, and pulsatility index standard parameters in vascular imaging would enhance reproducibility and mitigate interpretive bias. Moreover, the manuscript does not present data on interobserver agreement for these TPUS pattern interpretations, which is essential when proposing an imaging modality for broader clinical applications.

Therefore, this study lacked a direct comparison with established imaging standards for detecting subtle hemorrhoidal recurrences [4]. While retroflexed endoscopy was used as the reference standard, a comparative analysis of modalities such as high-definition anoscopy or endoanal ultrasound, which is considered an imaging standard in many specialized proctology centers for evaluating anorectal anatomy and pathology, would have provided a more robust validation of TPUS performance and helped position it within the current diagnostic hierarchy.

The clinical heterogeneity of the cohort (e.g., age range, sex distribution, and symptom profiles) was acknowledged, yet stratified analyses were not performed. It remains unclear

✉ Michele Schiano di Visconte
mschianodivisconte@gmail.com

¹ Colorectal and Pelvic Floor Diseases Center, Department of General Surgery, Azienda ULSS2, “Marca Trevigiana”, Via S. Ambrogio in Fiera 37, 31100 Treviso (TV), Italy

whether the observed vascular patterns correlate differently across patient subgroups, such as the type of recurrence or patient sex, further limiting the nuanced clinical applicability of the current findings.

A key issue is the clinical significance of the TPUS findings in relation to patient symptoms. The authors reported a statistically non-significant correlation between the vascular Doppler patterns and residual symptoms ($p = 0.089$). This lack of correlation raises questions about the direct clinical relevance of the observed Doppler patterns, particularly when patients remain symptomatic despite the absence of vascular signals on TPUS or vice versa.

This indicates that imaging findings should be interpreted with caution in conjunction with a comprehensive clinical assessment, rather than in isolation. The lack of correlation between Doppler vascular patterns and residual symptoms limits the practical utility of TPUS in isolation.

A diagnostic tool that does not reliably reflect a patient's clinical condition may lead to overinvestigation or undertreatment. In clinical settings, particularly those where resource allocation is a concern, the absence of symptom-imaging congruence raises doubts about the value of TPUS in decision making. Until more robust evidence links TPUS findings to symptom severity and type, its role should remain complementary rather than definitive during the postoperative follow-up.

Finally, while the authors highlight the practicality of TPUS, its clinical utility depends on operator skill, adequate training, and standardized image interpretation protocols. The study provides no details regarding the learning curve associated with this specific application of TPUS or data on intra- or interobserver variability, which are critical factors for ensuring reproducibility and facilitating broader adoption.

In conclusion, the innovative application of the TPUS by Gravante et al. for postoperative HD surveillance introduces a compelling investigative avenue, and the discussed methodological limitations necessitate cautious interpretation of the pilot findings [1]. Therefore, TPUS may represent a promising adjunctive modality for postoperative assessment of hemorrhoidal disease.

However, its role, particularly as a standalone screening instrument for hemorrhoidal recurrence, needs to be validated in larger prospectively designed multicenter studies. Future investigations should ideally incorporate preoperative baseline imaging, objective and quantitative Doppler metrics, rigorous interobserver reliability assessments, and direct comparisons with established standard imaging techniques [3, 4]. Additionally, health economic assessments and the development of standardized training frameworks are essential to support the integration of TPUS into routine clinical practice, especially in resource-limited settings [5].

Author contributions MSdV conceived and drafted the manuscript.

Data availability No datasets were generated or analysed during the current study.

Declarations

Ethics approval Ethical review and approval were not required for this study, as it did not involve new data collection or research involving human participants.

Competing interests The authors declare no competing interests.

Open Access This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Gravante G, De Simone V, Sorge R, La Torre M, D'Andrea V, Romano S, Gallo G (2025) Assessment of long-term outcomes following Milligan-Morgan hemorrhoidectomy with Doppler transperineal ultrasound and endoscopy: a pilot study. *Int J Colorectal Dis* 40:104. <https://doi.org/10.1007/s00384-025-04894-x>
2. Aimaity A, Ba Bai Ke Re A et al (2017) Sonographic appearance of anal cushions of hemorrhoids. *World J Gastroenterol* 23:3664–3674. <https://doi.org/10.3748/wjg.v23.i20.3664>
3. Nuernberg D, Saftoiu A, Barreiros AP, Burmester E, Ivan ET, Clevert DA, Dietrich CF, Gilja OH, Lorentzen T, Maconi G, Mihmanli I, Nolsoe CP, Pfeffer F, Rafaelsen SR, Sparchez Z, Vilman P, Waage JER (2019) EFSUMB recommendations for gastrointestinal ultrasound part 3: endorectal, endoanal and perineal ultrasound. *Ultraschall Med* 40:163–175. <https://doi.org/10.1055/a-0824-6952>
4. Albuquerque A, Pereira E (2016) Current applications of transperineal ultrasound in gastroenterology. *World J Radiol* 8:370–377. <https://doi.org/10.4329/wjr.v8.i4.370>
5. Brillantino A, Renzi A, Talento P, Bruscianno L, Marano L et al (2024) The Italian Unitary Society of Colon-Proctology (Società Italiana Unitaria di Colonproctologia) guidelines for the management of acute and chronic hemorrhoidal disease. *Ann Coloproctol* 40:287–320. <https://doi.org/10.3393/ac.2023.00871.0124>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.