הכינוס השנתי ה–67 של
האגודה הישראלית לחקר הפוריות (איל"ה)
12 במאי 2025, מלון דיווייד אינטרקונטיננטל, תל אביב

האגודה הישראלית לחקר הפוריות (איל"ה)
THE ISRAEL FERTILITY ASSOCIATION (IFA)
الجمعية الإسرائيلية لأبحاث الخصوبة

THE LEARNING CURVE OF HYFOSY: PERSISTENT DECREASE IN PROCEDURE TIME AND EARLY ACQUISITION OF ITS OPERATION QUALITY

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Introduction: Hystero-salpingo-foam-sonography (HyFoSy) is a relatively new method for evaluating the patency of fallopian tubes during infertility assessment. The procedure involves injecting a dedicated micro bubble foam from hydroxyethyl cellulose, glycerol, saline, and air into the uterine cavity under transvaginal sonography guidance.

Purpose: To outline the learning curve of the time taken to operate the HyFoSy procedure and its quality based on a single OBGYN US unit's experience.

Methods: A retrospective analysis of data collected from the **first cohort of 200 patients** admitted to the OBGYN US unit in Barzilai Medical Center for HyFoSy examinations divided into two groups:
- **Group A**: The first 100 patients – **represent the early learning stage,**
- **Group B,** The subsequent 100 patients – **represent the later learning stage**.

The groups were compared based on the time it took to perform the procedure and its quality in assessing tubal patency.

Results
- **Group B** had a shorter **total procedure time (TPT)** than **Group A,** averaging 19.2 ± 6.8 minutes and 27.4 ± 10.2 minutes respectively (P < .001).
- **The time for catheter application** in the uterine cervix and **the time of foam injection** steps were both significantly shorter in **Group B** than in **Group A**: 6.6 ± 4.5 vs. 10.8 ± 6.7 (P < 0.001) and 5.6 ± 3.1 vs. 9.8 ± 5.5 (P < 0.001) minutes, respectively.
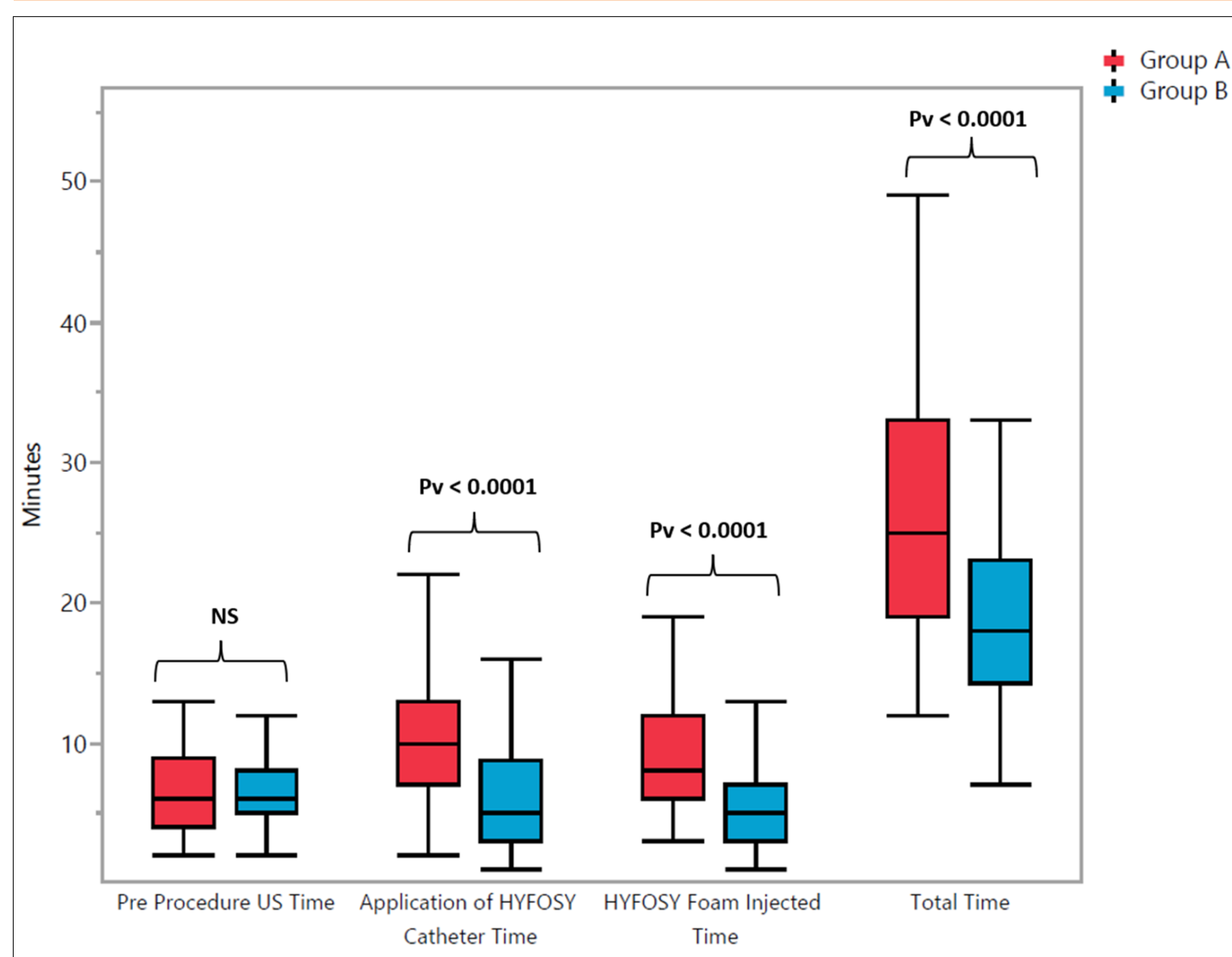
- **Multivariate logistic regression analyses** indicated that the likelihood of a shorter **TPT** was five times greater in **Group B** than in **Group A** (P < 0.001).
- The average reduction in **TPT** for **Group B**, compared to **Group A**, was 8.16 ± 8.66 minutes, indicating a decrease of 30% (P < 0.01).
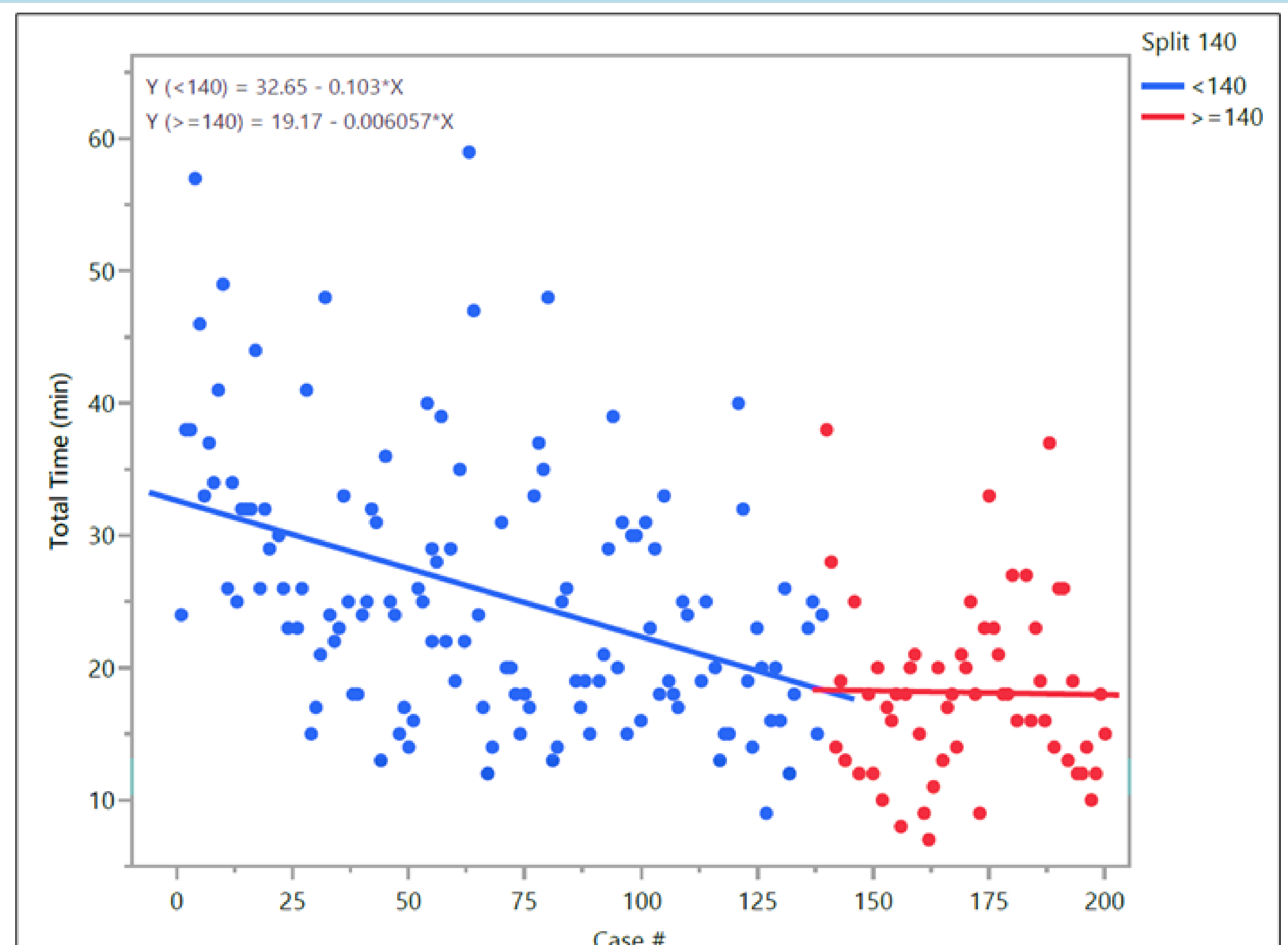
- **A linear regression analysis** demonstrated a significant and consistent decrease in **TPT** throughout **the first 140 procedures (Blue).**
- The initial **TPT** of 32.65 decreased to a plateau of 19.17 minutes, by a **rate of one minute for every ten exams** performed (P < 0.001).
- Beginning with **the 141st exam (Red),** where the **TPT** was 19.17 minutes, the regression line indicates a plateau (P-NS, R-0.0002).

- **Quality evaluation of the exam**: The original operators' interpretations of **tubal patency** were compared to the retrospective analysis of two experienced reviewers who served as the gold standard.
- Notably, the **accuracy** and **positive and negative predictive values** across all the study cohorts were **91.8%, 94.4%, and 91.2%,** respectively, **with no significant differences** between the two study groups.

Conclusion: HyFoSy's learning curve shows a consistent and significant decrease in the total procedure time until it plateaus after a relatively short period, while the quality evaluation demonstrates an early acquisition of procedure quality - indicating that implementing the HyFoSy procedure is an accessible and efficient process.