

Outcomes in Robotic Transabdominal Pre-Peritoneal Repair for Inguinal Hernia Surgery; the First 100 Cases

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Background

- Robotic surgery is transforming hernia repair, with encouraging outcomes and growing procedural volumes
- Nearly **¾ UK inguinal hernia repairs performed open** - reflects hesitation & barriers to adoption of new technology
- Warrants real-time analysis of **safety**, clinical **outcomes** & **learning curves**.

Method

- Prospective data capture for patients undergoing **robotic inguinal hernia** repair during the **introduction of robotics** to a high-volume, single-surgeon practice
- Aim: perioperative safety profile and learning curve analysis.

Results

Jan 2023-Oct 2024: **100** robotic inguinal hernia repairs

- Unilateral n=55
- Bilateral n=39
- Combined procedures n=6

Demographics:

- Male n=97
- Median age **67** (IQR 60–74)
- Majority **ASA II** (60%) or **ASA III** (25%)

- Median blood loss: **0mL** (no transfusions)
- Conversion to open: **1%**
- Day-case rate: **67%**
- Complication-free** recovery: **90%**
- Major complications** (CDIII/above): **3%**
- 1 patient readmitted, returned to theatre and sadly died within 30 days of surgery (*pathology unrelated to his hernia*).
- Early recurrence: **1%**
- No** mesh explantations.
- Median follow-up: 80 days.

CUSUM Analysis of Console Time (CT)

- CUSUM analysis of unilateral inguinal hernia demonstrated **3 learning phases** (figure 1) with **rapid acquisition of short CT** (median **35 min**; IQR 26–50), which **decreased significantly** over time while perioperative outcomes remained consistent.

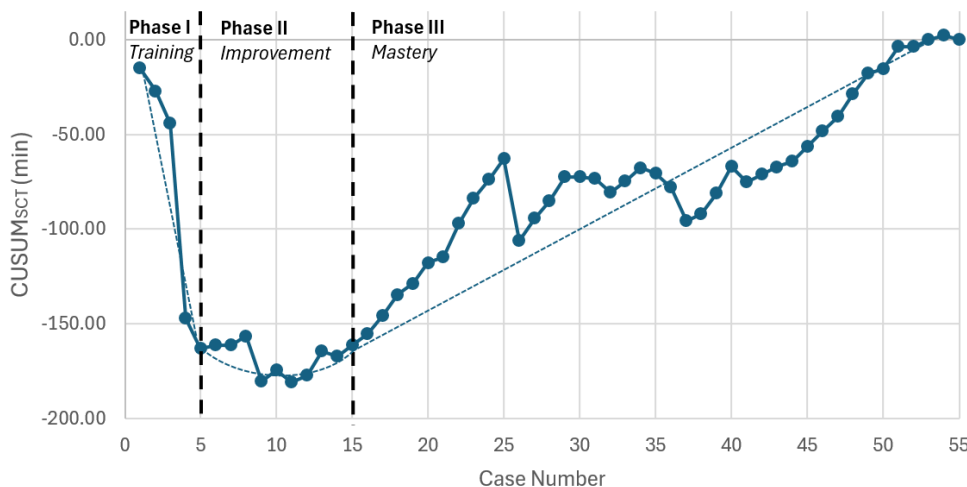


Figure 1: Cumulative Sum (CUSUM) learning curve analysis of surgical console time (SCT) for robotic unilateral inguinal hernia repair.

Initial training (case 1-5): increasing CUSUM reflects CT consistently above the target level as basic competencies are developed.

Improvement (case 6-15): flattening of the curve indicates CT approaching the target value with ongoing improvements in performance.

Mastery (case 16 onwards): focus shifts from reducing CT to stabilising at a consistent target level.

Conclusion

Our results support the safe integration of robotic hernia surgery into practice, with acceptable perioperative outcomes and 90% complication-free recovery. CUSUM analysis demonstrated clear learning curve phases, with rapid improvements in CT over time.