Learning Curve of Robotic-Assisted Transabdominal Preperitoneal Inguinal Hernia Repair: CUSUM Analysis of Single Surgeon's Experience

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Background

- Robotic-assisted transabdominal preperitoneal (r-TAPP) inguinal hernia repair (IHR) gained popularity among general surgeons.
- The benefits of r-TAPP IHR include shorter recovery time and better ergonomics.
- No consensus has been reached in definition of experienced robotic surgeon in comparisons with laparoscopic-TAPP IHR
- **This study investigated the safety and efficacy of r-TAPP IHR in the early phase of the learning curve using a CUSUM analysis.**

Methods

- Retrospective cohort study from August 2020 to July 2023.
- IRB#: EH23-058
- **Complex r-TAPP IHR criteria**: recurrent hernia, previous prostatectomy, scrotal hernia, and incarceration of bowel
- The variability of each repair's skin-to-skin time from its cohort's mean after accounting for bilaterality and complexity was used to plot a CUSUM curve.

Baseline/clinical characteristics	
	mean (range)
Number of patients	n = 111
Age (years)	54.4 (14-90)
Gender (M:F)	109 : 2
Pre-op BMI (kg/m²)	26.6 (17.2-48.3)
ASA	2.2 (1-4)
Hispanic (n, %)	29 (26.1%)
Unilateral IHR (n, %)	94 (84.7%)
Bilateral IHR (n, %)	17 (15.3%)
Complex cases (n, %)	59 (53.2%)

r-TAPP IHR outcomes			
	Early phase: n (%)	**Late phase: n (%)**	**P value**
EBL (mL)	23.1±15.1	11.8±6.9	<0.001
Operative time (min)	88.7±29.3	79.5±31.5	0.115
Overall Complications	15 (32%)	9 (16%)	0.065
Seroma	9 (19%)	6 (11%)	0.242

r-TAPP IHR mean operative time (min)		
	Simple	**Complex**
Unilateral	69.0±18.8	88.3±31.0
Bilateral	95.7±41.0	118.5±30.4

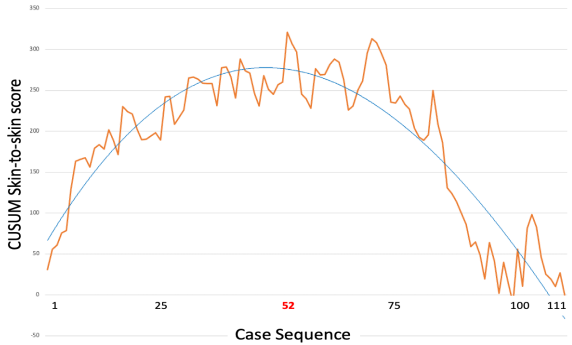


Figure 1: CUSUM analysis of r-TAPP IHR using skin-to-skin times

Results

- The peak point of r-TAPP based on the CUSUM plot was **52 cases**.
- The late phase had a more favorable EBL.
- The early and late phases had no statistical difference in operative time and 30-day complication rates, but trended to late.
- There were no 30-day postoperative recurrence or mortality.

Conclusion

- CUSUM analysis showed operative time, EBL and 30-day complication rates slowly improved after 52 cases.
- **Further studies should include multiple surgeons with various surgical knowledge and experiences.**
- **Previous definitions of 'experienced robotic surgeon' may warrant further evaluation.**