UNIKLINIK KÖLN
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First Series of on Demand Robot Surgery using the Dexter Surgical Robot from Low to Medium Complexity Cases

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Introduction

Although robotic surgery is advancing rapidly, laparoscopic surgery maintains a pivotal role in daily practice. Since 2021 the on-demand Dexter Robotic System™ (Distalmotion, Epalinges, Switzerland), with its surgeon's console, two patient carts with instrument arms, and one endoscope arm offers an alternative compromise between these two techniques. Trocars can be used for both robotic and laparoscopic instruments. This allows for step-specific usage of robotic surgery depending on complexity of the surgical tasks. We present our first data using the Dexter Robotic System™ in a series of low and medium complexity cases.

	TAPP	Cholecystectomy
Patients (n)	4	15
Operative time (minutes - mean)	81.25	60.6
Docking time (minutes - mean)	6	5.6
Draping time (minutes - mean)	10.5	10.6
Trendelemburg degrees (median)	11	-13
Tilt degrees (median)	4	5
Lenght of stay (days - mean)	1.25	3
Complications (n)	0	1
Coversion from robotic surgery	0	0

Table 1: *Results stratified by surgery*

Methods

Between July 2023 and March 2024, we recruited 19 patients scheduled for minor and middle complexity surgery, in particular inguinal hernia surgery and cholecystectomy. The procedures were performed by two specialized and trained robotic surgeons. The analyzed variables were mean operating time, mean robotic operating time, mean docking-time and draping-time, conversion rate, length of stay, 30-day morbidity and mortality.

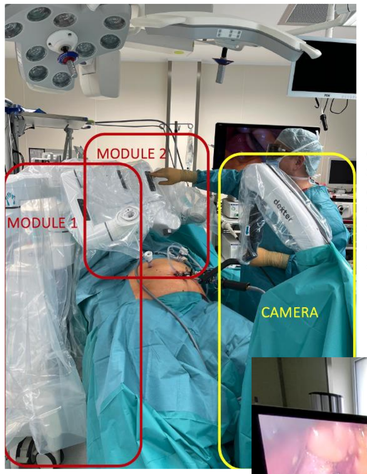


Fig.1: *Intraoperative set-up of Dexter Robotic System™: the components of the systems which could be controlled by the assistant surgeon*

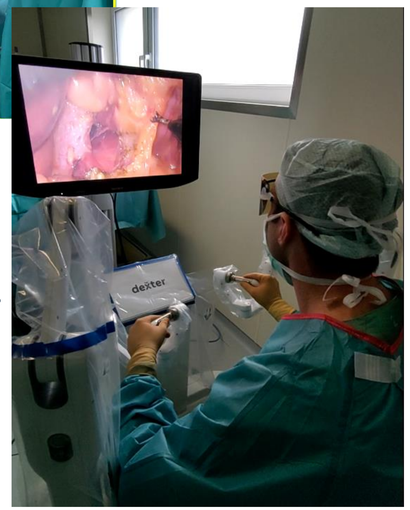


Fig.2: *Intraoperative set-up of Dexter Robotic System™: the operating surgeon at the console*

Results

Between April 2023 and March 2024, 19 surgeries using the Dexter robotic system were analyzed, comprising 12 females (63.1%) and 7 males (36.9%) with a median age of 52.5 years. Procedures included Transabdominal Preperitoneal (TAPP) hernia repairs and cholecystectomies. The mean operative time for TAPP was 81.25 minutes, while for cholecystectomy, it was 60.6 minutes. A learning curve analysis for cholecystectomies showed a significant decrease in total surgical time from 66.8 minutes to 58.6 minutes (p=0.03) and robotic time from 37.2 minutes to 27.8 minutes (p=0.01). Overall, the average hospital stay was 3 days, with one case of postoperative bile leakage managed conservatively.

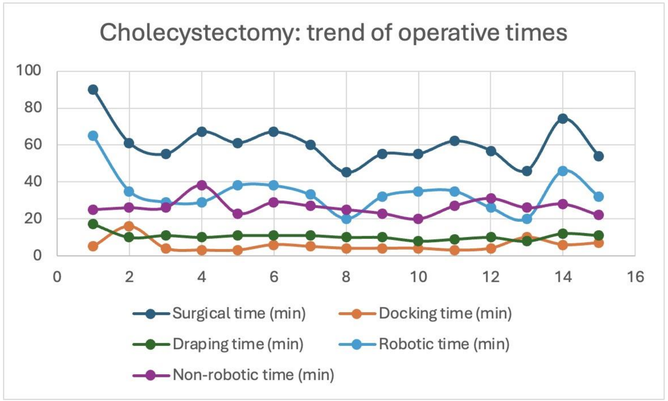


Fig.3: *Scatter plot showing the trend of operative times in the performed cholecystectomy for each phase of surgery*

Conclusion

This is the first report of Dexter surgery in a non-academic German hospital setting. Feasibility and ease of use were proven. Our results suggest more usage of this surgical robot in non-academic settings with low to intermediate complexity cases or outpatient clinics in Germany.