UNIKLINIK KÖLN
Department of General, Visceral and Cancer Surgery
University Hospital of Cologne

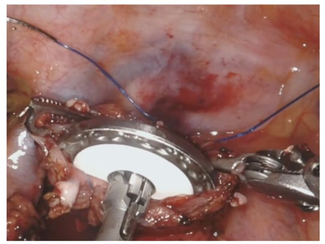
University Hospital Cologne International

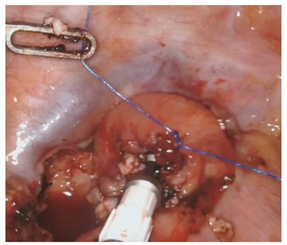
Technical improvements of the anastomotic technique in robotic assisted minimally invasive esophagectomy (RAMIE) can significantly reduce anastomotic leak rates – Experience of a German High-Volume Center

Dolores T Müller, Benjamin Babic, Florian Gebauer, Rabi R Datta, Hans Schlößer, Lars Schiffmann, Wolfgang Schröder, Christiane J Bruns, Hans F Fuchs

Introduction

Minimally invasive surgery and lately the usage of robotic technology has reduced the invasiveness of procedures, leading to improved patient outcomes after esophagectomy. The esophagogastric anastomosis represents a crucial step of the Ivor-Lewis procedure, as technical errors may lead to anastomotic leakage and severe postoperative morbidity. Anastomotic integrity is influenced by many different factors and there is great technical variety among surgeons. We have previously shown that a standardized 28-mm circular stapled anastomosis is very safe in Hybrid Minimally Invasive Esophagectomy. The aim of this study was to present and evaluate our standardized robotic circular stapled anastomotic technique in comparison to our large Hybrid patient collective





Methods and Procedures

Analysis of our prospectively collected, IRB approved database of hybrid, open, and robotic esophagectomies was performed. Starting 01/2019, we implemented an updated robotic standardized anastomotic technique using a circular stapler and ICG (indocyanine green) for our RAMIE cases at our academic center (Picture 1). Outcomes of patients undergoing this standardized robotic Ivor Lewis esophagectomy for esophageal cancer from 01/2019 – 11/2020 were compared to our overall cohort from 06/2016-06/2020 (Hybrid/Open group).

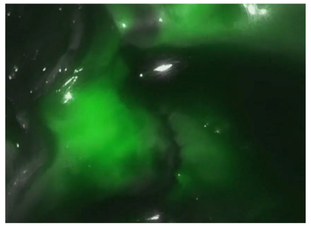
	Robotic		Hybrid/Open		
	n	(%)	n	(%)	P Value
Total	56	100	519	100	--
Anastomotic leak types					
Type I	0	(0)	1	(0.2)	1
Type II	1	(1.8)	49	(9.4)	0.0750
Type III	0	(0)	13	(2.5)	0.6266
Clavien-Dindo Classification					
CD 0	29	(51.8)	177	(34.1)	0.0121
CD I	2	(3.6)	26	(5)	1
CD II	7	(12.5)	42	(8.1)	0.3083
CD IIIa	10	(17.9)	187	(36)	0.0071
CD IIIb	3	(5.4)	29	(5.6)	1
CD IVa	4	(7.1)	27	(5.2)	0.5300
CD IVb	1	(1.8)	19	(3.7)	0.7098
CD V	0	(0)	12	(2.3)	0.6180

Table 2: Anastomotic leak types and severity of postoperative complications. Severity of complications was significantly less in patients that underwent a standardized robotic Ivor Lewis esophagectomy.

Results

A total of 615 patients were analyzed. A total of 96 patients underwent a robotic assisted Ivor Lewis esophagectomy. Of these, a total of 56 patients underwent a robotic thoracic reconstruction using the updated standardized circular stapled anastomosis. A total of 64 patients were operated using an open approach and 455 underwent a hybrid procedure with a circular stapled anastomosis (Hybrid/Open group). Demographic and oncological data did not differ between groups. Mean age was 63 years (range 46-80) in the robotic group and 63 years (range 33-91) in the hybrid/open group. Further details about postoperative complications are depicted in Table 2. One patient developed an anastomotic leak in the robotic group, resulting in an anastomotic leak rate of 1.8 %. In comparison 63 patients (12%) developed an anastomotic leak in the Hybrid/Open group (p = 0.0132). Median length of stay (LOS) was 13 days in the robotic group (range 7-52), compared to a median LOS of 15 days (range 9-99) in the open/hybrid group





Conclusion

A standardized circular stapled anastomosis in RAMIE cases for esophageal cancer may result in very low anastomotic leak rates and thereby positively influence outcomes in selected esophageal cancer patients.