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Long-term outcome of patients with intermediate- and high-risk endometrial cancer after pelvic and paraaortic lymph node dissection: a comparison of laparoscopic vs. open procedure

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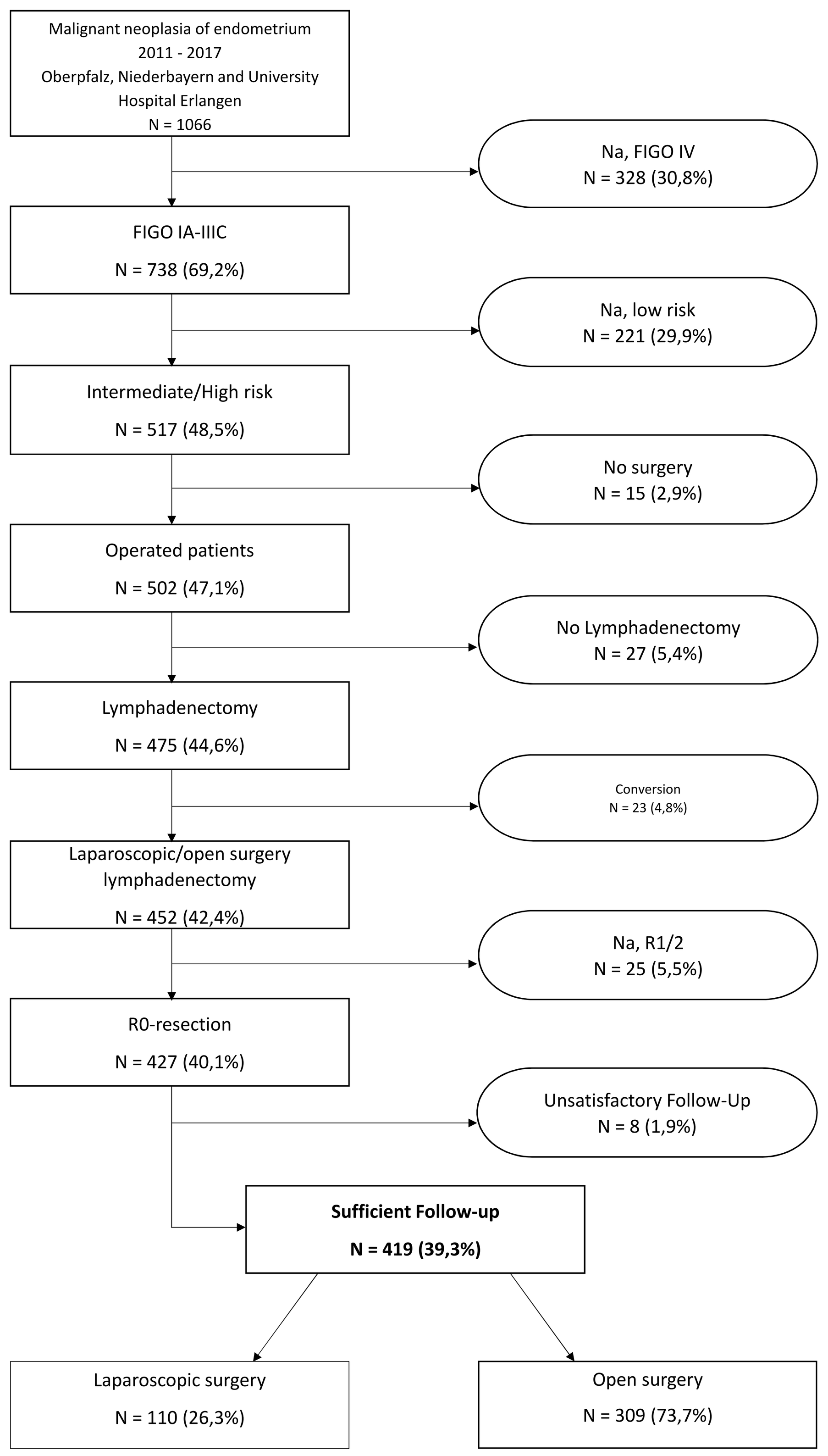

Fig. 1 Flow-chart showing inclusion and exclusion criteria

Methods

Study design: population-based, retrospective cohort study including 419 patients who have been diagnosed with intermediate- or high-risk endometrial cancer from 2011 to 2017
Data: using data from the clinical cancer register at the Regensburg Tumor Center and the University Hospital of Erlangen
Inclusion criteria: patients with intermediate- or high-risk endometrial cancer who underwent laparoscopic or open lymphadenectomy, no conversion, with R0-resection and sufficient follow-up
Statistical analysis: Kaplan-Meier-method, uni- and multivariable Cox-regression, with and without propensity score matching
Endpoints: overall survival, recurrence rates, recurrence free survival according to surgery approach

Purpose

The primary therapy for intermediate and high risk endometrial cancer includes pelvic and paraaortic lymph node evaluation. Laparoscopic surgery is an increasingly popular intervention due to decreased risk and better short term morbidity. Nevertheless, there is a lack of reliable information about this intervention concerning oncological long-term outcomes such as recurrence and survival rate.
In this cancer registry study, we sought to evaluate the benefit of laparoscopy and retrospectively compared overall survival, recurrence rates and recurrence-free survival among patients with intermediate and high-risk endometrial cancer who underwent either laparoscopic or open surgery.

Table 1: Patient characteristics according to surgery approach in total cohort

		Surgery approach						X2
		Laparoscopic		Open surgery		Total		
		N	%	N	%	N	%	p
Age at diagnosis	< 65	47	42.7%	116	37.5%	163	38.9%	0.338
	65+	63	57.3%	193	62.5%	256	61.1%	
Charlson-Comorbidity-Index	0	76	69.1%	228	73.8%	304	72.6%	0.343
	1+	34	30.9%	81	26.2%	115	27.4%	
FIGO stage	I	80	72.7%	191	61.8%	271	64.7%	0.075
	II	17	15.5%	54	17.5%	71	16.9%	
	III	13	11.8%	64	20.7%	77	18.4%	
Nodal status	N0	98	89.1%	251	81.2%	349	83.3%	0.163
	N1	10	9.1%	47	15.2%	57	13.6%	
	NX/na	2	1.8%	11	3.6%	13	3.1%	
Histologic type/grading	G1/G2 and type 1	69	62.7%	137	44.3%	206	49.2%	**0.001**
	G3/G4 or type 2	41	37.3%	172	55.7%	213	50.8%	
Risk group	Intermediate risk	67	60.9%	150	48.5%	217	51.8%	**0.026**
	High risk	43	39.1%	159	51.5%	202	48.2%	
Lymph vessel invasion	L0	86	78.2%	228	73.8%	314	74.9%	0.619
	L1	21	19.1%	73	23.6%	94	22.4%	
	LX/na	3	2.7%	8	2.6%	11	2.6%	
Vein invasion	V0	98	89.1%	275	89.0%	373	89.0%	0.802
	V1	8	7.3%	26	8.4%	34	8.1%	
	VX/na	4	3.6%	8	2.6%	12	2.9%	
Primary therapy	Surgery+Rad+CTX	17	15.5%	54	17.5%	71	16.9%	0.761
	Surgery+Rad	62	56.4%	158	51.1%	220	52.5%	
	Surgery+CTX	5	4.5%	12	3.9%	17	4.1%	
	Surgery only	26	23.6%	85	27.5%	111	26.5%	
	Total	110	100.0%	309	100.0%	419	100.0%	

Results

5-year overall survival: The 5-year-overall survival rate in the total cohort was 72.0% but was statistically significantly better for laparoscopic surgery (87.6%) than for laparotomic surgery (68.0%, logrank *p* = 0.002). The univariable Cox-regression (HR of 0.346 with 95% CI from 0.174-0.688; p = 0.002) and the multivariable Cox-regression (HR of 0.435 with 95% CI from 0.217-0.871; *p* = 0.019) confirmed the significant benefit for laparoscopic surgery. (Fig. 2)
5-year cumulative recurrence rate: The 5-year cumulative recurrence rate was assessed as 21.5% in the entire cohort. We found a weak statistically significant difference between the patients who underwent laparoscopic (13.8%) and laparotomic surgery (23.9%; *p* = 0.039). The univariable Cox-regression confirmed this result (HR of 0.516 with 95% CI 0.272–0.979; *p* = 0.043). The multivariable Cox-regression did not present any significant differences between both interventions (HR of 0.706 with 95% CI 0.367–1.358; *p* = 0.297). (Fig. 3)
5-year recurrence free survival: The 5-year recurrence-free survival in the cohort was 66.6%. We obtained a strong statistically significant difference between laparoscopic (80.3%) and laparotomic surgery (62.7%, *p* = 0.003). The univariable Cox-regression also showed a benefit for the laparoscopic intervention (HR of 0.4476 with 95% CI from 0.260 to 0.767; *p* = 0.003) while the multivariable Cox-regression failed to present a significant difference between both procedures (HR of 0.635 with 95% CI from 0.365 to 1.104; *p* = 0.108).

Propensity Score Matching with a cohort of 357 patients matched 1:3
5-year overall survival after PSM: Survival after laparoscopic surgery (87.5%) was significantly higher than after open surgery (71.6%, *p* = 0.013). Both univariable Cox-regression (HR of 0.422 with 95% CI from 0.210 to 0.849; *p* = 0.016) and multivariable Cox-regression (HR of 0.362 with 95% CI from 0.174 to 0.757; *p* = 0.007), confirmed statistical significance.
5-year recurrence rate after PSM: The rate was not significantly lower for laparoscopic surgery (14.1%) than for laparotomic surgery (21.6%, *p* = 0.144). In agreement with this finding, neither the univariable Cox-regression (HR of with 95%CI from 0.320 to 1.188; *p* = 0.148) nor the multivariable Cox-regression (HR of 0.732 with 95% CI from 0.378 to 1.419; *p* = 0.356) lead to a statistical significant difference between both interventions.
5-year recurrence free survival after PSM: The 5-year recurrence-free overall survival was significantly (*p* = 0.027) higher for patients who underwent laparoscopic surgery (80.0%) than for patients who underwent laparotomic surgery (66.2%). Univariable Cox-regression analysis revealed only a weak statistical significance (HR = 0.541 with 95% CI from 0.311 to 0.940; *p* = 0.029). The multivariable analysis did not present a statistically significant difference (HR of 0.640 with 95% CI from 0.366 to 1.120; *p* = 0.118) at all.

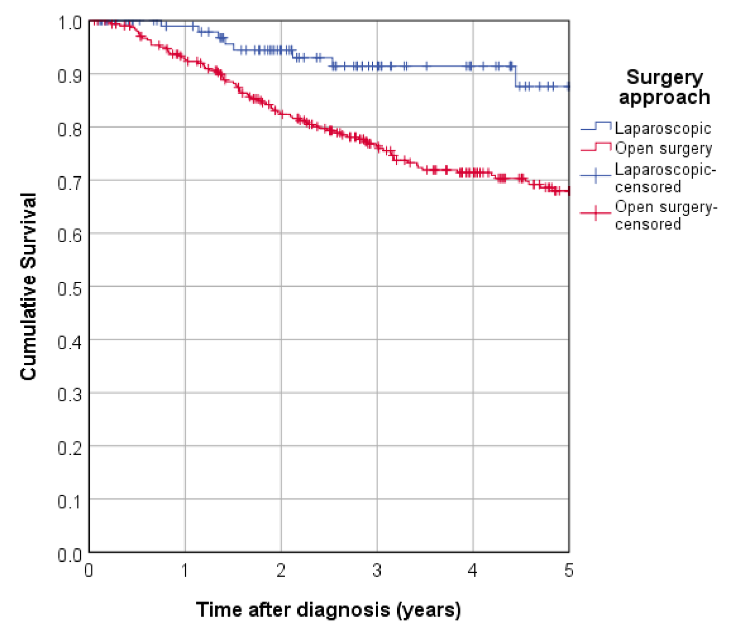

Fig. 2: 5-year overall survival

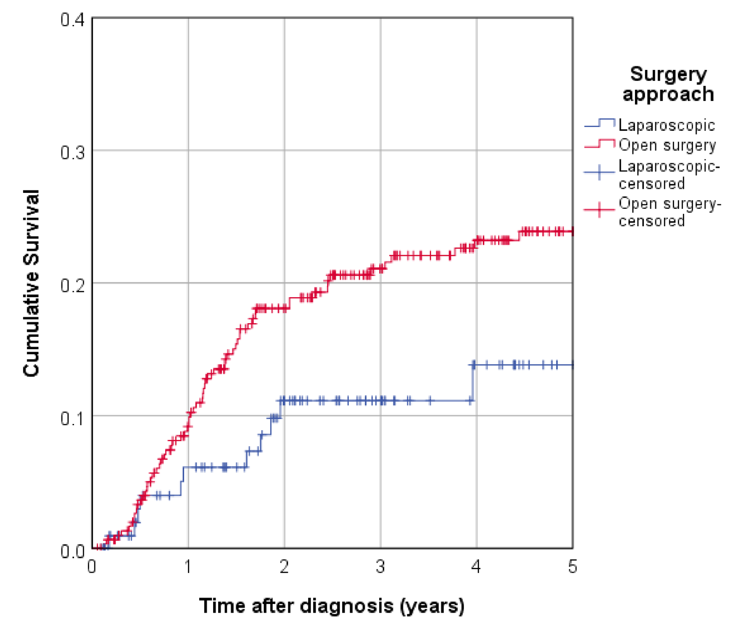

Fig. 3: 5-year recurrence rate

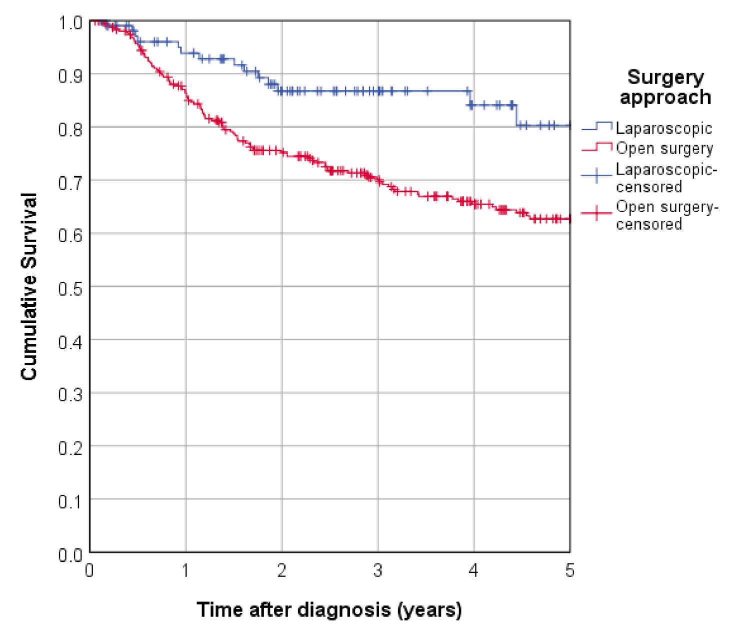

Fig. 4: 5-year recurrence free survival

Conclusions

Our study provides evidence that with regard to oncological safety laparoscopic systematic lymphadenectomy does not fare worse than open surgery in the treatment of endometrial cancer.

References

Papathemelis T, Oppermann H, Grafl S, Gerken M, Pauer A, Scharl S, Scharl A, Inwald E, Ignatov A, Ortmann O, Klinkhammer-Schalke M, Hein A, Beckmann MW, Lux MP (2019)
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