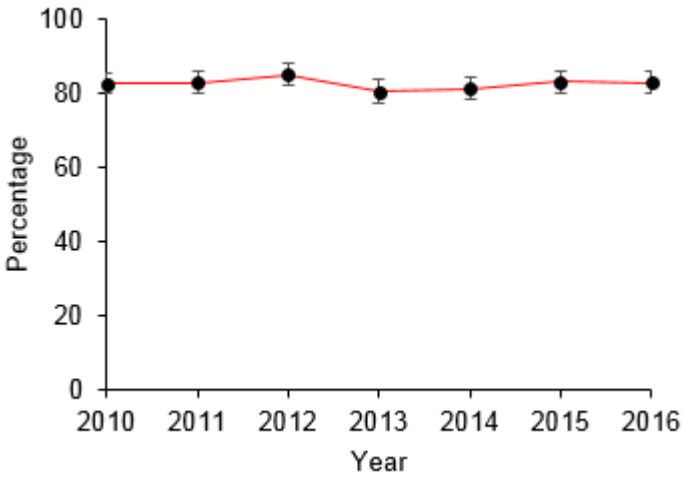
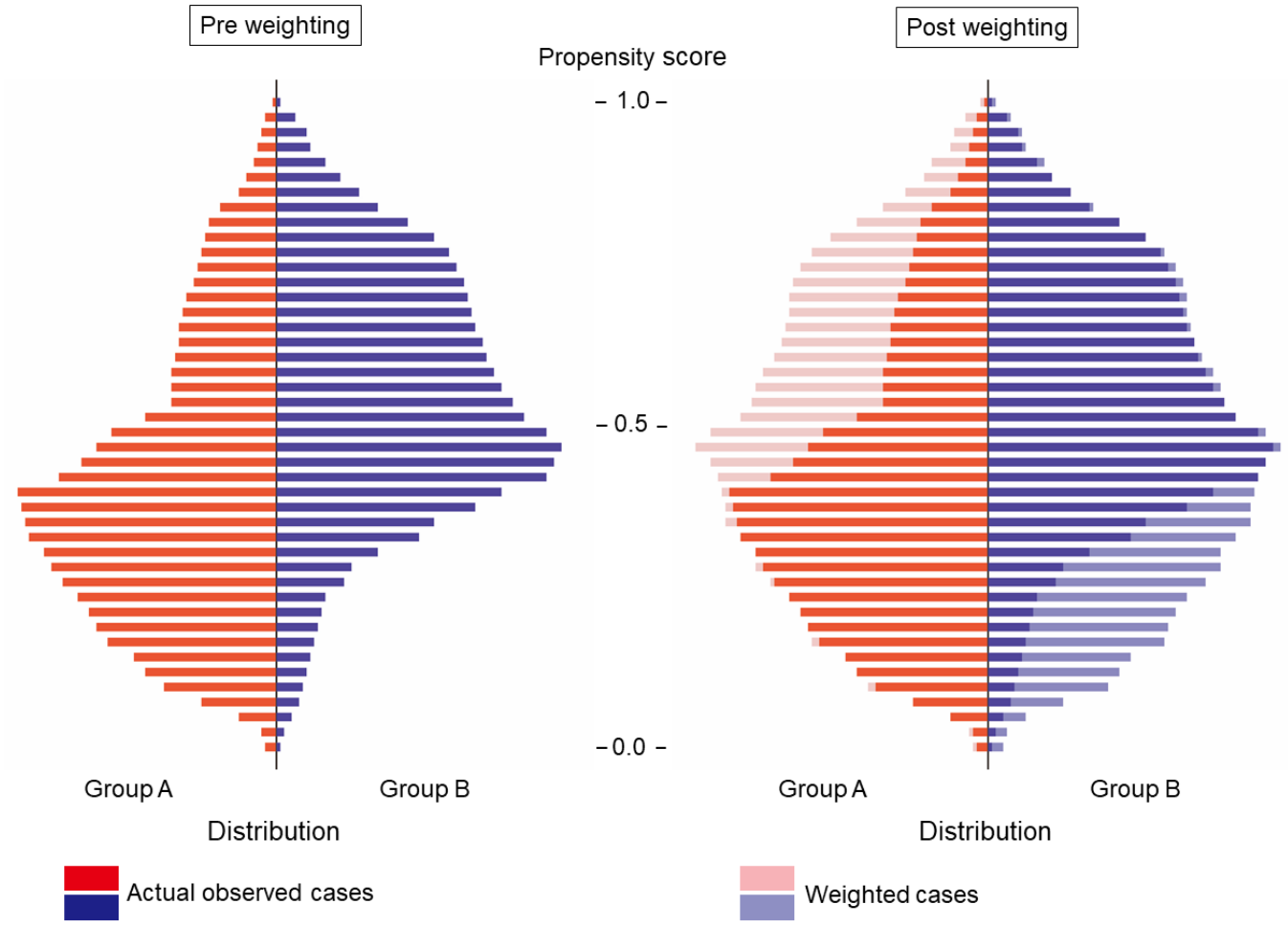
Supplemental Figure S1. Trend of hysterectomy approach for early cervical cancer.



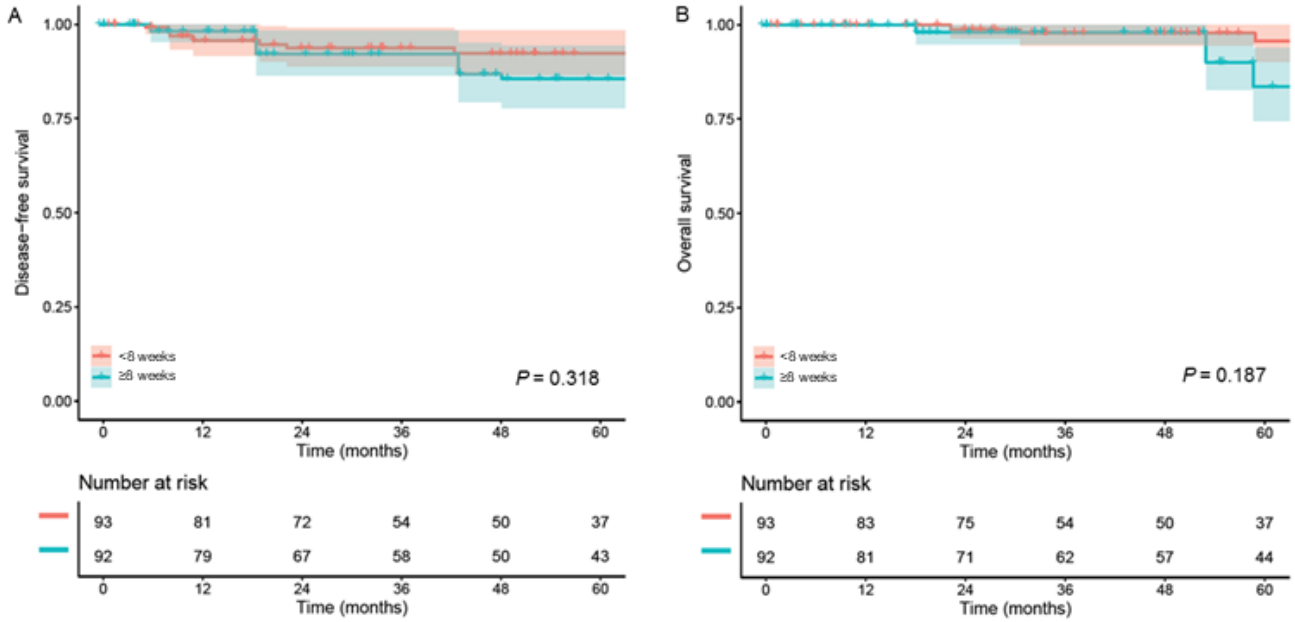
SEER*Stat 8.3.6 was used to generate the data. Proportional trend of hysterectomy (including trachelectomy) for stage T1b (≤4cm) cervical cancer between 2010 and 2016 is shown. The Cochran-Armitage test for trend, *P*=0.743. Dots represent observed value and bars represent 95% confidence interval.

Supplemental Figure S2. Schema of PS-IPTW.



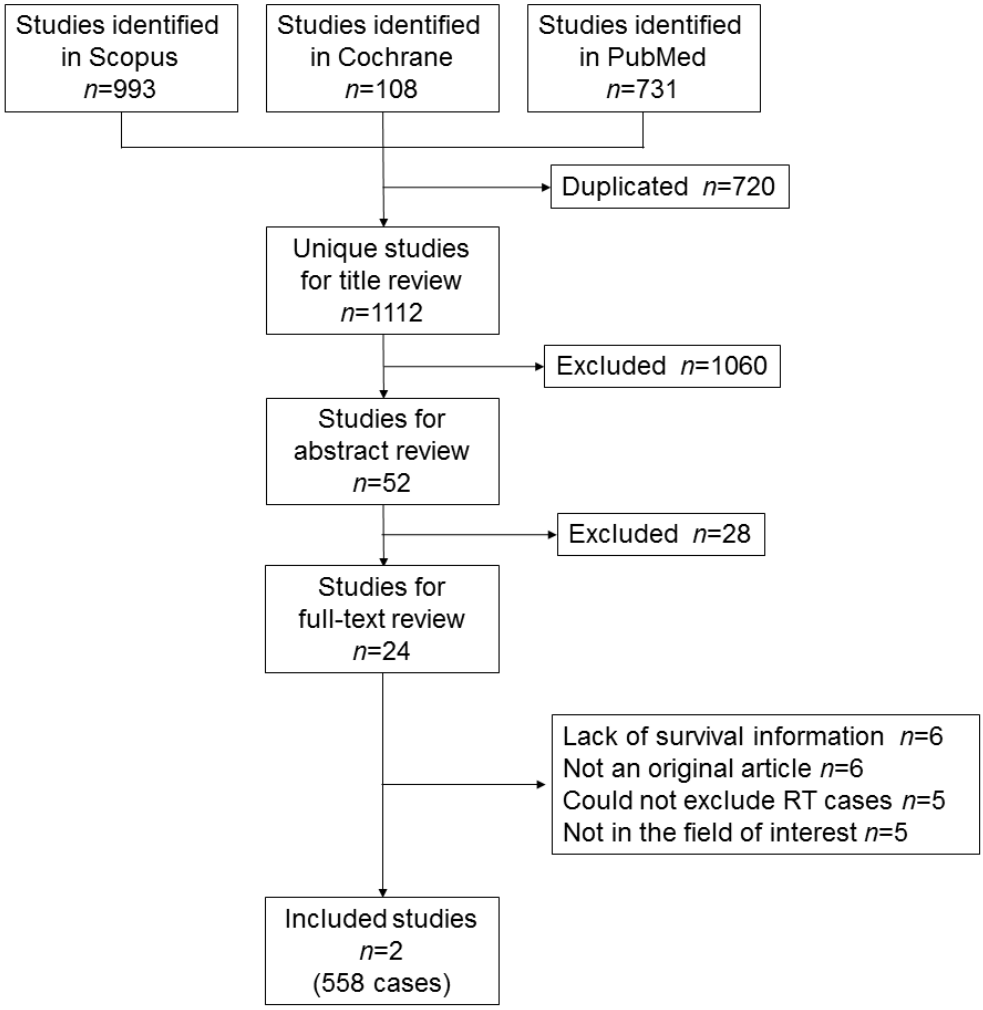
Mirrored histogram of distribution of propensity scores is shown. Actual observed cases (bold color) are displayed based on propensity score in the two groups (A and B) in the mirrored histogram. PS-IPTW creates a weighted cohort that differed based on the exposure allocation but was similar with respect to other characteristics. After PS-IPTW, two groups are balanced for the propensity score distribution (bold and thinned colors).

Supplemental Figure S3. Survival outcomes based on wait-time for surgery in squamous tumors (PS-IPTW model).



Disease-free survival (panel A) and overall survival (panel B) are shown based on wait-time from cervical cancer diagnosis and hysterectomy or trachelectomy. Cox proportional hazard regression model for *P*-values. Color bands indicate 95% confidence interval.

Supplemental Figure S4. Schema for systematic literature review.



Supplemental Table S1. Balance statistics for patient demographics (PS-IPTW model).

Characteristic	Short wait-time	Long wait-time	*P*-value
Number	*n*=134	*n*=138	
Age			0.951
<30	6 (4.2%)	5 (3.7%)	
30-39	32 (23.6%)	38 (27.5%)	
40-49	47 (35.1%)	52 (37.5%)	
50-59	25 (19.0%)	23 (16.7%)	
60-69	22 (16.3%)	17 (12.0%)	
≥70	3 (1.8%)	4 (2.6%)	
Year			0.967
2000-2005	24 (17.9%)	24 (17.4%)	
2006-2011	76 (56.7%)	81 (60.9%)	
2012-2017	34 (25.4%)	34 (24.6%)	
Race/ethnicity			0.935
White	9 (6.9%)	9 (6.3%)	
Black	5 (3.6%)	4 (3.2%)	
Hispanic	95 (71.0%)	101 (73.4%)	
Asian	11 (8.0%)	14 (9.9%)	
Others*	14 (10.5%)	10 (7.2%)	
Body habitus**			0.994
Normal/underweight	25 (18.5%)	24 (17.1%)	
Overweight	38 (28.5%)	41 (29.7%)	
Class I	34 (25.7%)	39 (27.9%)	
Class II	6 (4.6%)	8 (5.8%)	
Class III	12 (8.7%)	11 (7.9%)	
Unknown	19 (14.0%)	16 (11.6%)	
Histology			0.647
Squamous	91 (68.4%)	94 (68.1%)	
Adenocarcinoma	36 (27.2%)	35 (25.4%)	
Adenosquamous	6 (4.4%)	7 (5.1%)	
Others	0	2 (1.4%)	
Clinical stage			0.999
IA1	38 (28.1%)	39 (27.9%)	
IA2	13 (9.5%)	12 (9.0%)	
IB1	40 (30.0%)	43 (31.4%)	
IB2	35 (25.8%)	33 (23.7%)	
IB3	6 (4.5%)	8 (5.5%)	
IIA	3 (2.2%)	3 (2.3%)	
Pelvic nodal mets			0.954
No	88 (65.8%)	92 (66.9%)	
Yes	13 (9.8%)	12 (8.3%)	
Not sampled	33 (24.4%)	34 (24.8%)	
Surgery type			0.999

Abdominal RH†	83 (61.7%)	85 (61.7%)	
LSC RH	7 (5.1%)	7 (5.6%)	
RA-RH	4 (3.0%)	3 (2.4%)	
TAH	19 (14.3%)	18 (13.2%)	
TLH	12 (9.1%)	13 (9.4%)	
Vaginal	6 (4.5%)	7 (5.3%)	
Trachelectomy	2 (1.1%)	2 (1.7%)	
Unknown	2 (1.1%)	1 (0.6%)	
Postop radiotherapy			0.770
No	101 (75.3%)	107 (77.4%)	
Yes	33 (24.7%)	31 (22.6%)	

Number (percentage per group) is shown. Total number may not be 272 due to weighted values. Numbers were rounded up and may not match to percentage (weighted value). *including unknown. **Per the CDC classification. †including type II. Abbreviations: RH, radical hysterectomy; LSC, laparoscopic; RA, robotic-assisted; TAH, total abdominal hysterectomy; mets, metastasis; TLH, total laparoscopic hysterectomy; and postop, postoperative.

Supplemental Method S1. Systematic literature review and meta-analysis.
We performed a systematic review and meta-analysis to determine the impact of waiting time of surgical treatment on survival of women with early-stage cervical cancer. The meta-analysis aimed to investigate survival outcome (OS) and disease-free survival (DFS) with comparison of short and long waiting time for surgical treatment.

Article retrieval
We conducted a systematic search of articles published through March 30, 2020, using PubMed, Scopus, and Cochrane Central Register of Controlled Trials (CENTRAL), as performed in our previous study [1-4]. We reviewed articles according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines [5]. Studies were identified by screening the titles, abstracts, and full texts of relevant articles, as previously described. All abstracts were screened by SM.

Initially, various patterns of keywords listed below were used to identify studies on endometrial cancer. We used the International Federation of Obstetrics and Gynecology (FIGO) 2009 or 2018 system to identify FIGO stage I and II cervical cancer. Only English articles were included and the search strategy involved the use of these keywords : Uterine Cervical Neoplasms [MeSH] (Except for Scopus search), ‘cervical cancer or carcinoma or malignancy or neoplasm,’ ‘uterine cervical cancer or carcinoma or malignancy or neoplasm,’ ‘squamous cell carcinoma of the cervix,’ ‘adenocarcinoma of the cervix,’ ‘cancer or carcinoma or invasive carcinoma of the cervix,’ ‘cancer or carcinoma or invasive carcinoma of the uterine cervix.

Thereafter, the selected studies were screened to identify studies that investigated the impact of waiting time for surgical treatment, using the following keywords: "wait time" or "waiting time" or "waited time" or "wait* time" or "delay" or "length of time" or "time interval" or "time to treatment". The references of the identified articles were also reviewed, and articles that met the inclusion criteria were included.

Inclusion criteria
Studies were included if they met the following inclusion criteria: (i) patients with early cervical cancer (treated with surgery); (ii) sufficient information of waiting time and relevant outcomes; (iii) waiting time was classified; (iv) original articles involving studies, such as retrospective or prospective cohort studies, population-based case-control studies, and randomized controlled trials.

Exclusion criteria
The studies with following criteria were excluded: (i) insufficient information for waiting time; (ii) insufficient survival or recurrence information; (iii) not in the field of interest; (iv) inclusion of advanced stage or recurrent cases; (v) could not exclude radiation therapy cases (vi) waiting time was not classified; (vii) articles involving case reports, case series, and systematic reviews; (viii) articles not in English; (ix) conference abstracts; and (x) pregnancy cases.

Data extraction
Data were extracted by SM, and the following variables were recorded: histology type, year of study, first author’s name, number of included cases, rate of malignant peritoneal cytology cases, and outcomes of interest (OS and DFS).

Meta-analysis plan

From the eligible study data, survival outcome estimates for malignant versus negative peritoneal cytology were computed by using the 95% confidence intervals of the reported values to estimate the hazard ratios for OS and DFS. Heterogeneity across studies was examined using I^2, which measures the percentage of total variation across studies. The meta-analysis and the production of all graphics were performed using RevMan 5.3 software (Cochrane Collaboration, Copenhagen, Denmark). For consistency, data from all outcomes (continuous and bivariate) were entered into RevMan 5.3 in such a way that negative effect sizes or relative risks less than one favored active intervention.

References

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[3] Matsuo K, Shimada M, Matsuzaki S, Machida H, Nagase Y, Saito T, Kamiura S, Iwata T, Sugiyama T, Mikami M. Significance of Malignant Peritoneal Cytology on the Survival of Women with Early-Stage Cervical Cancer: A Japanese Gynecologic Oncology Group Study. J Clin Med. 2019;8.
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[5] Moher D, Liberati A, Tetzlaff J, Altman DG, Group P. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. BMJ. 2009;339:b2535.