National trends in total pelvic exenteration for gynecologic malignancies

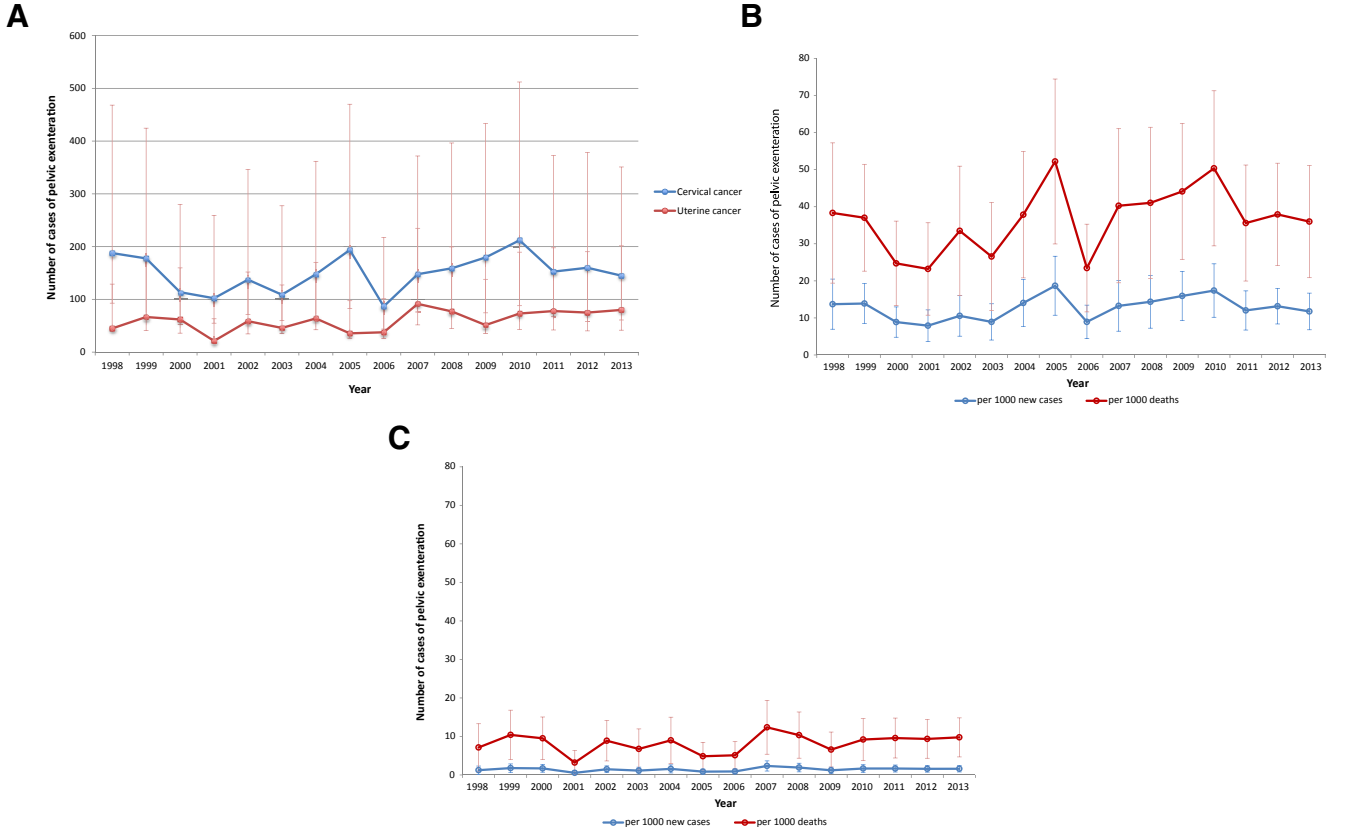
OBJECTIVE: Total pelvic exenteration (TPE) is a radical procedure involving en bloc resection of the pelvic viscera. The procedure may be performed as primary treatment for gynecologic malignancies or as a salvage therapy in women with a pelvic recurrence.[1,2] It is unclear how improvements in radiation and chemotherapy have impacted the use of TPE. We performed a population-based analysis to examine the annual rate of TPE among women with cervical and uterine cancer.

STUDY DESIGN: The Nationwide Inpatient Sample (NIS) was used to determine the annual number of TPE (*International Classification of Diseases, Ninth Revision* code 68.8) performed in women with a diagnosis of cervical or uterine cancer from 1998 through 2013.[3] NIS provides hospital weights that were used to derive national estimates.[4]

We report the weighted annual number of TPE performed in the United States for both cervical and uterine cancer. To account for changes in the incidence and mortality of these tumors over time, we used statistics from the American Cancer Society to derive the number of TPE performed per 1000 new cases of each cancer type and per 1000 deaths for the cancers of interest.[5] Trends over time were compared using linear regression approaches. All hypothesis tests were 2-sided. A P value $<.05$ was considered statistically significant. All analyses were conducted using software (SAS, Version 9.4; SAS Institute, Cary, NC).

RESULTS: From 1998 through 2013, there were 2411 TPE performed in the United States for cervical cancer. The annual number of TPE performed ranged from a low of 87 cases (95% confidence interval [CI], 43−130) in 2006 to a

FIGURE
Pelvic exenterations, 1998-2013



A, Number of pelvic exenterations performed for cervical and uterine cancer from 1998 through 2013. Rates of pelvic exenteration per number of new cases and deaths for **B**, cervical and **C**, uterine cancers.

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high of 212 cases (95% CI, 124−300) in 2010 ($P = .47$) (Figure, A). The rate of TPE per 1000 new cases of cervical cancer ranged from 8 (95% CI, 4−12) to 19 (95% CI, 11−27) per year ($P = .26$). The annual rate of TPE per 1000 cervical cancer deaths varied from 23 (95% CI, 11−36) in 2001 to 50 (95% CI, 29−71) in 2010 ($P = .15$) (Figure, B). Over the same time period, 963 TPE were performed for uterine cancer. The number of cases per year ranged from 21 (95% CI, 0.4−42) in 2001 to 91 (95% CI, 40−143) in 2007 ($P = .03$). Per 1000 new cases of uterine cancer this translated into 0.6 (95% CI, 0.01−1) to 2 (95% CI, 1−4) cases per year (Figure, C).

CONCLUSIONS: These data suggest that TPE is a rare procedure for both cervical and uterine cancer. Although there was year-to-year variation in the rate of the procedure, despite improvements in radiation and chemotherapy, there were no clear trends toward a decrease in number of the exenterations over time. While our study is drawn from a national sample of representative hospital discharges, we recognize several important limitations. Most importantly, we cannot exclude the possibility of under-capture of some cases using available billing codes. Second, NIS does not capture longitudinal data, and we therefore lack both pretreatment and posttreatment therapy as well as long-term outcomes. These findings help define practice patterns in the United States. Additionally, the low overall number of TPE performed have important implications for surgical training. ■

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Dr Wright (NCI R01CA169121-01A1) received a grant from the National Cancer Institute.

The authors report no conflict of interest.

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 http://dx.doi.org/10.1016/j.ajog.2016.06.031