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Smaller pelvic volume is associated with postoperative infection after pelvic salvage surgery for recurrent malignancy



Edward L. Jones, M.D.^a, Teresa S. Jones, M.D.^a,
Alessandro Panizza, M.D.^a, Justin S. Merkow, M.D.^a,
Daniel M. Wells, M.D.^b, Nathan W. Pearlman, M.D.^a,
Martin D. McCarter, M.D.^{a,*}

^aDepartments of Surgery and ^bRadiology, University of Colorado, 12631 E 17th Avenue, MSC302, Aurora, CO 80045, USA

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Abstract

BACKGROUND: Patients with recurrent pelvic malignancy have few treatment options, and surgery is fraught with complications. We sought to characterize the relationship between radiographic pelvic volume and postoperative complications after pelvic salvage surgery.

METHODS: A retrospective chart review of all patients undergoing pelvic exenteration or abdominoperineal resection for recurrent malignancy between 1998 and 2013 was performed. Preoperative computed tomography was used to determine pelvic volume.

RESULTS: Forty-two patients underwent surgery for recurrent rectal (26, 62%), prostate (8, 19%), or anal squamous cell cancer (8, 19%). Thirty-eight patients (90%) suffered complications and there was one (2%) perioperative death. Decreasing pelvic volume was associated with deep or organ space infections ($P = .01$), sepsis ($P = .03$), and fistula ($P = .05$) on univariate analysis. Infections remained significant on multivariate analysis (odds ratio, 1.01; $P = .02$).

CONCLUSIONS: Pelvic salvage surgery for recurrent malignancy is associated with a high complication rate yet low mortality. Decreasing pelvic volume is associated with increasing risk of deep or organ space infections.

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Recurrent pelvic malignancy has few treatment options. Local recurrence often causes chronic pain, difficulty voiding and defecating, and can result in decreased quality of life as well

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* Corresponding author. Tel.: +1-303-724-2736; fax: +1-303-724-2682.

E-mail address: Martin.McCarter@UCDenver.edu

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as survival.^{1,2} Most patients with recurrence have already undergone intensive chemotherapy, radiation therapy, and/or surgical resection. These treatments combined with the baseline difficulty of achieving a complete resection because of anatomic constraints results in a nearly universal morbidity (10% to 100%) and significant mortality (0% to 25%).³⁻⁷ Despite the complex nature of pelvic salvage surgery, its benefits in both survival and quality of life demand its continued practice.⁸⁻¹³

The most frequently reported operations for recurrent pelvic malignancy (abdominoperineal resection [APR] or

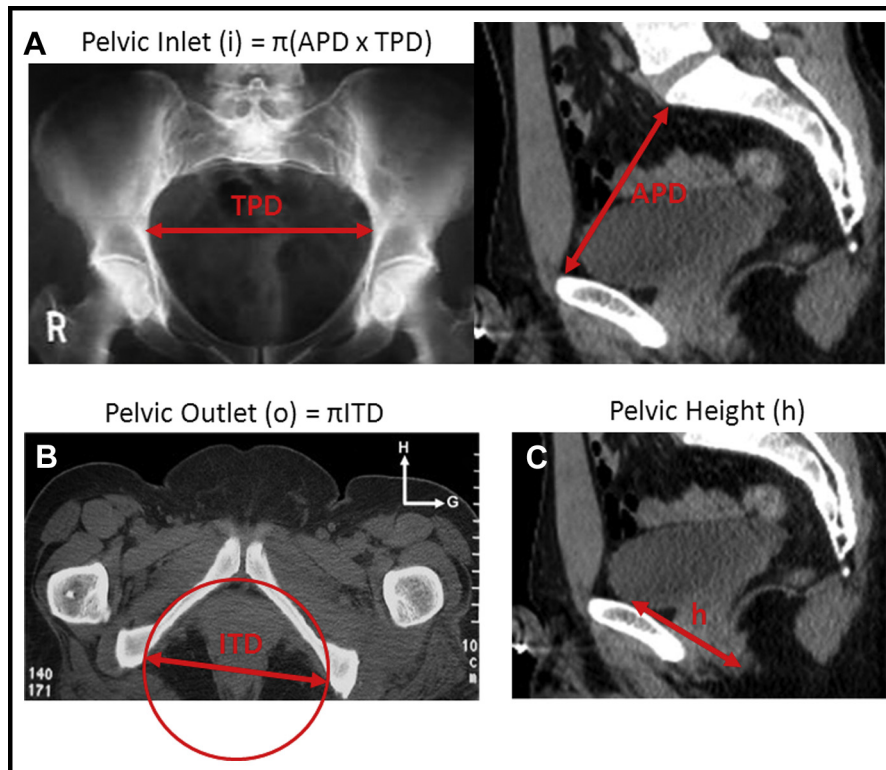


Figure 1 Standardized pelvimetric measurements. (A) Pelvic inlet measurements and calculation, (B) pelvic outlet measurement and calculation, and (C) pelvic height measurement. APD = anteroposterior pelvic diameter; ITD = intertuberous diameter; TPD = transverse pelvic diameter. (For interpretation of the references to color in this Figure, the reader is referred to the web version of this article.)

pelvic exenteration [PE]) are undertaken for rectal cancer. With regard to incidence, rectal cancer is followed by gynecologic malignancies, anal squamous cell cancer, and prostate cancer. No matter the type of malignancy, the only chance for cure is surgical resection. To reduce complications, surgeons seek to preoperatively optimize wound healing by improving nutrition and reducing obesity and tobacco use.^{14–16} Investigation into nonmodifiable anatomic risk factors has been rarely reported.

Difficult pelvic anatomy, that is the “hostile” pelvis, has long been anecdotally associated with poorer outcomes in pelvic

surgery. Yet minimal supporting data are available for risk stratification. Smaller radiographic pelvic diameter has been associated with increased operative times and complications in laparoscopic surgery for rectal cancer.^{17–19} Studies have also associated smaller pelvimetric measurements with an increased risk of positive margins after prostate cancer surgery.^{18–20} We could find no other data correlating pelvic anatomy with perioperative outcome, and no studies described patients with recurrent malignancy. This information is especially important when counseling patients with recurrent cancer as reoperation is a massive undertaking in an oft-malnourished patient who has undergone

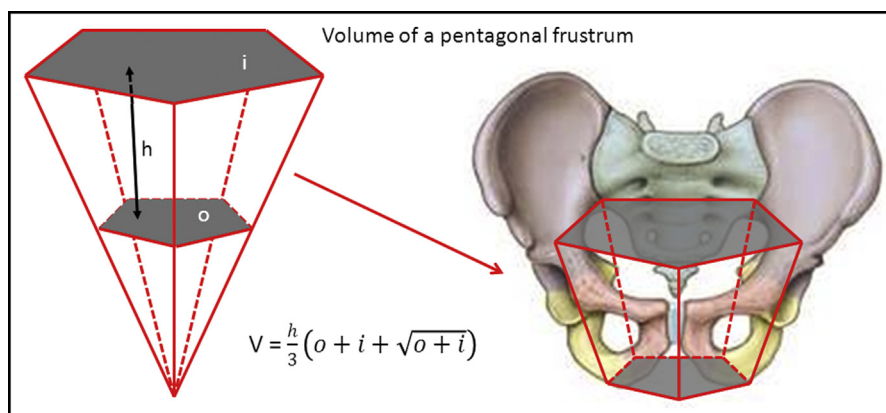


Figure 2 Pelvic volume estimation from a pentagonal pyramid. A section of a pentagonal pyramid, a “frustum,” is used to estimate the pelvic volume from the pelvic inlet (i), outlet (o) calculations and the pelvic height (h) measurement. V = volume. (For interpretation of the references to color in this Figure, the reader is referred to the web version of this article.)

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