

Use of a Tampon to Enhance Vaginal Localization in Computed Tomography

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Computed tomography (CT) of the pelvis may be one of the more promising applications of this diagnostic method. In this region, tissue planes and organs are generally well discriminated by natural accumulations of fat, and, unlike the upper abdomen, physiologic movement which might degrade images is minimal. Nevertheless, in the presence of neoplastic disease and fluid accumulations, confusion may arise in discriminating normal from abnormal structures.

Experience has shown the value of contrast enhancement of various pelvic structures. Early reports showed the advantage of intravenous iodinated contrast media to image the ureters and bladders directly, as well as to increase the absorption differences between structures of different vascularities [1]. Identification of bowel loops is facilitated by the ingestion of dilute water-soluble contrast material.

Negative contrast has also been useful. In this regard, we found that intravesical carbon dioxide gas enhances the imaging of bladder neoplasms [2]. This report illustrates how the vagina can be more clearly imaged with negative contrast produced after insertion of a vaginal tampon. The technique is currently used routinely at our institution.

Method

Prior to CT examination of the pelvis, the patient is given a large-sized vaginal tampon to insert. If necessary, assistance is provided by a nurse or technologist. CT scanning is then performed in the usual manner using other contrast agents as indicated. At the conclusion of scanning, the tampon is removed.

Results of this technique are illustrated in figure 1. Examinations were performed on a Delta scanner with a scanning time of 2 min 43 sec, a section thickness of 1.3 cm, and a 256 X 256 matrix.

Case Reports

Case 1

A 64-year-old female developed postmenopausal bleeding. Adenocarcinoma of the uterus was diagnosed and treated by intracavitary radium followed by hysterectomy. The tumor was confined to the uterus. About 1 year later a nodular mass was palpated superior and right of the vaginal apex and in the left lateral fornix. On an intravenous urogram, it caused an impression upon the bladder and partially obstructed the right ureter. CT examination documented a tumor extension to the left of the vagina, which was identified by the tampon gas shadow (fig. 2).

Case 2

A 63-year-old female had a 3 week history of hematuria and a 9 kg weight loss during the previous year. A left bladder mass was detected on an intravenous urogram, and cystoscopy was performed. An irregular neoplastic mass was seen posteriorly on the left with elevation of the left bladder floor. On bimanual examination there was fixation in the left hemipelvis. Pathologic diagnosis was transitional cell carcinoma, grade IV.

CT examination was performed with the patient prone after instillation of 150 ml of carbon dioxide into the bladder via catheter and insertion of a vaginal tampon (fig. 3). The bladder neoplasm extended alongside the vagina posteriorly toward the rectum and laterally toward the pelvic wall. This confirmed the findings of the bimanual examination.

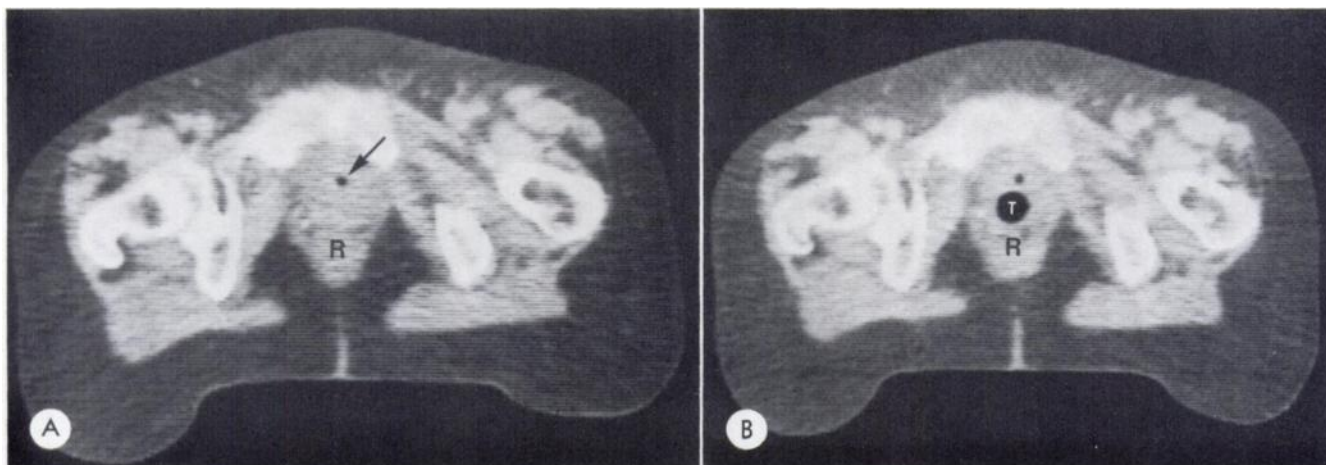


Fig. 1.—A, CT scan of normal female pelvis at level of symphysis pubis showing collapsed vagina indistinguishable from distal rectum (R) and region of bladder neck, which is identified by gas-containing lumen of catheter (arrow). B, CT scan of same patient at same level after tampon insertion showing tampon gas shadow (T) distending and identifying vagina. Distal rectum (R) again identified.

Received December 13, 1976; accepted after revision February 23, 1977.

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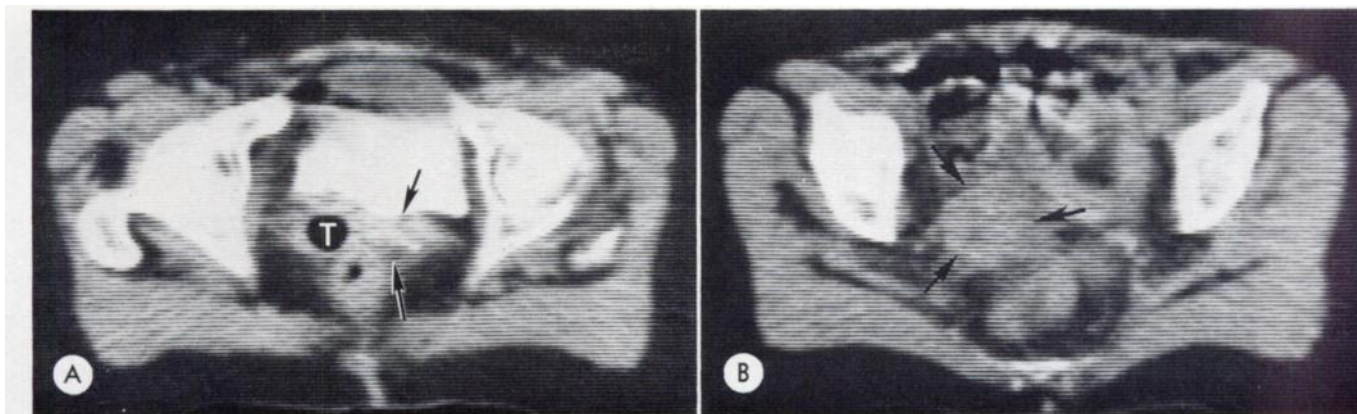


Fig. 2.—Case 1. *A*, CT scan showing tumor extension (*arrow*) to left of vagina, which is identified by tampon gas shadow (*T*). Rectum containing small amount of gas seen posteriorly, and contrast medium present in bladder. *B*, CT scan at level of superior limit of vaginal cuff (*arrows*) showing bulk of recurrent mass. Location obtained by following tampon gas shadow superiorly on sequential scans.

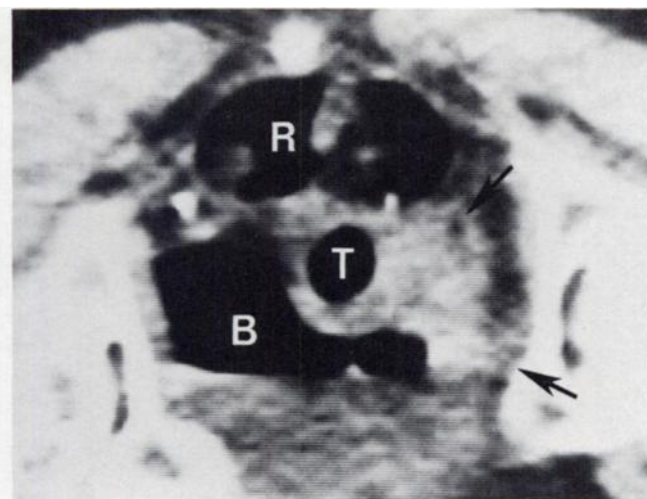


Fig. 3.—Case 2. CT scan with patient prone after instillation of 150 ml carbon dioxide into bladder (*B*) via catheter and insertion of vaginal tampon (*T*). Bladder neoplasm (*arrows*) extends alongside vagina posteriorly toward rectum (*R*) and laterally toward pelvic wall (*lower arrow*), correlating with results of bimanual examination. Rectum contains gas and feces.

Discussion

Sufficient gas is trapped within the fibers of the tampon to provide good negative contrast. As a result, the vagina is clearly localized and partially distended. The uterine cervix can also be identified at the section superior to the termination of the gas shadow. Therefore, the relationship of entities such as abscesses or neoplasms to the vaginal canal and cervical region can be better defined (figs. 2 and 3).

The uterine corpus can usually be identified by relating it to sequential sections. In selective cases this can be precisely localized by the intracavitary insertion of an intrauterine device, such as a Lippes loop, during CT examination.

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