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# PRİMER VAJİNAL KANSERDE VAJİNAL SU-BAZLI JEL YARDIMLI MANYETİK REZONANS GÖRÜNTÜLEME

# MAGNETIC RESONANCE IMAGING GUIDES THE MANAGEMENT OF PRIMARY VAGINAL CANCER

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## ABSTRACT

We report two cases of vaginal squamoz cell carcinoma with magnetic resonance imaging findings. Both of the patients were staged as stage 1 with physical examination findings under general anesthesia. We performed magnetic resonance imaging for these patients filling water-based gel to their vagina during the scan for preventing collapse of vaginal walls so that we could reveal the tumor anatomy and extension more accurately. One of the patients MRI findings showed an infiltration through subvaginal tissues. So we abandoned surgical treatment for this patient and choose radiotherapy. We think that, pelvic MRI performed with vaginal water-based gel can demonstrate tumor infiltration to paravaginal tissues better than physical examination, which helps well-directed management of this rare gynecological cancer.

**Key Words:** Vaginal cancer, Magnetic resonance imaging, Water-based gel

## ÖZET

İki vajinal squamoz hücreli karsinom olgusunun, vajene su-bazlı jel doldurularak alınan manyetik rezonans görüntülemelerinin, genel anestezi altında yapılan fizik muayene bulgularına yapabileceği ek katkıları değerlendirdik. Sunduğumuz iki olgu da genel anestezi altında yapılan fizik muayeneye göre evre 1 olarak değerlendirildi. Ardından her iki hastaya da vajene su-bazlı jel ile doldurup vajen duvarlarının kollapsını engelleyen, bu sayede vajendeki tümör anatomisini ve yayılımını daha iyi gösteren bir teknikle manyetik rezonans görüntüleme(MRG) yapıldı. Olgulardan birinin MRG bulgularında subvajinal dokulara infiltrasyon izlendi. Bu nedenle bu hastada cerrahi tedaviden vazgeçtik ve primer kemoradyasyon ile tedaviye karar verdik. Vajinal su-bazlı jel ile yapılan pelvik MRG'nin vajinal kanser olgularında tümör anatomisini ve paravajinal dokulara infiltrasyonu göstermede genel anestezi altında yapılan fizik muayeneye üstün olduğuna ve bu nadir jinelkolojik kanserlerin daha ideal yönetimine katkı sağlayacağına inanmaktayız.

**Anahtar Kelimeler:** Vajinal kanser, Manyetik rezonans görüntüleme, Su-bazlı jel

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## Introduction

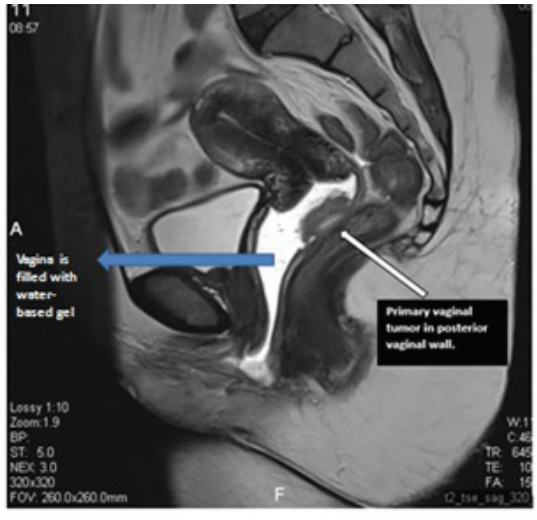
Primary cancer of the vagina comprises approximately 3% of all malignant neoplasms of the female genital tract (1). The incidence of squamous cell in situ or invasive cancer of the vagina is approximately 1 per 100.000 women (2). Squamous cell carcinoma which tends to occur more commonly in the proximal third of the vagina is the most common histologic type of primary vaginal cancer. Approximately 80–90% of primary vaginal cancers are squamous cell carcinomas and 4–10% are adenocarcinomas, whereas malignant melanomas are very rare. Sarcoma, and other histologic types such as carcinoid, small cell, lymphomas, and undifferentiated have also been reported (3-7). The tumor should be classified as carcinoma of the vagina when the primary site of the growth is the vagina, and therefore its origin from the uterine cervix or uterine body should be excluded with colposcopy, hysteroscopy or dilatation and curettage if needed. A tumor involving both the vagina and the cervix should be classified as a cervical carcinoma, and similarly a tumor involving both the vagina and the vulva should be considered as a vulvar carcinoma. An invasive squamous cell carcinoma occurring in the vagina >5 years after treatment for invasive squamous cell carcinoma of the cervix is assumed to be a new primary vaginal cancer (8,9). Although primary vaginal cancer is rare, metastatic disease to the vagina is not uncommon. The vagina can be a common site of metastatic gynecological cancer, either by direct extension of cervical and vulvar tumors or through lymphatic or vascular metastases, as seen in endometrial cancer and gestational trophoblastic disease, respectively. Metastatic or direct extension of non-gynecologic tumors to the vagina can also occur from the urinary bladder, urethra, periurethral glands, rectum, and rarely the breast, lung, or other sites (9).

In general, risk factors for in situ and invasive vaginal neoplasia are associated with the same risk factors as in cervical neoplasia; multiple lifetime sexual partners (five or more), early age at first intercourse, smoking, alcohol, abnormal cytology, and prior hysterectomy. In a population-based study from Denmark, 89% of women with squamous cell carcinoma of the vagina were high-risk HPV positive. Women treated for a previous anogenital cancer (especially carcinoma of the cervix) and women who were treated with pelvic radiotherapy also have a higher risk of developing vaginal cancer (2,10,11).

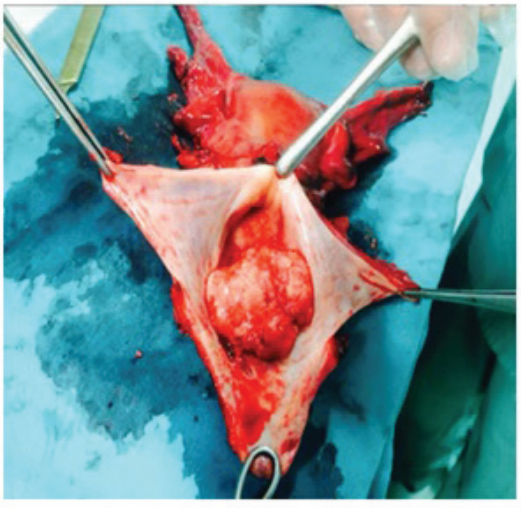
We present two patients with primary vaginal carcinomas that have similar physical examination findings, but were treated differently due to magnetic resonance imaging (MRI) results. We used water-based gel for distention of the vaginal walls so that we were able to detect tumor size and extension more accurately.

## Case 1

A 40 year-old patient presented with bloody vaginal discharge. Pelvic examination revealed an exophytic tumoral mass in the mid-posterior vaginal wall with no pelvic side wall and parametrial involvement. MRI confirmed that there was no rectovaginal space or parametrial involvement and a positron emission tomography combined with computerized tomography (PET/CT) showed localized disease to vagina (Figure 1A and 1B). She underwent radical hysterectomy and total abdominal vaginectomy with pelvic lymph node dissection. Permanent pathology demonstrated stage I disease limited to vaginal epithelium and no adjuvant treatment was recommended. At 1 year follow-up she was free of disease.




A)



B)

**Figure 1**• A) Magnetic resonance imaging shows tumor limited to vaginal epithelium. B) Radical resection with enbloc vaginectomy.

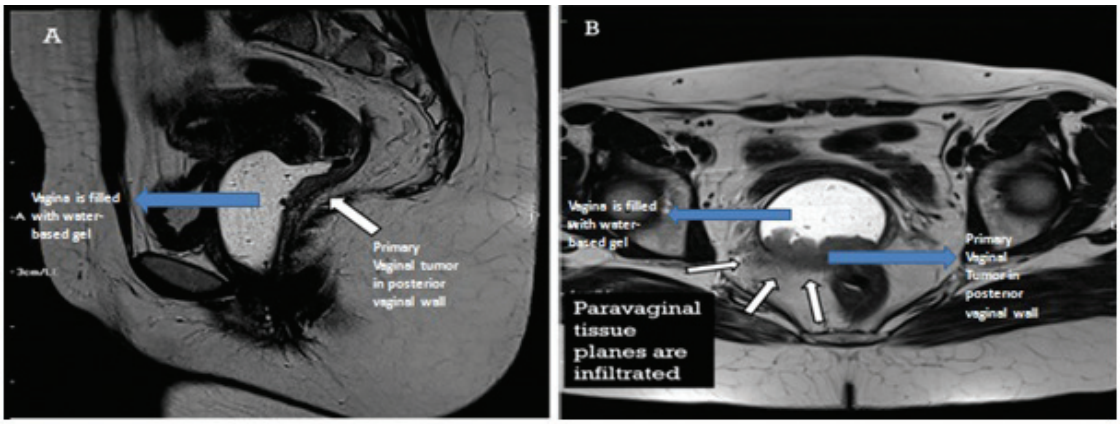



**Figure 2•** A) Similar posterior tumor is shown in sagittal section. B) Tumor infiltration to paravaginal tissues was shown in transverse section.

## Case 2

The second case was a 40 year-old woman. She was admitted to our center due to postcoital bleeding. Her vaginal examination revealed a necrotic mass in posterolateral vagina. Pelvic side walls and parametria were free of disease according to rectovaginal digital examination. She was referred for primary chemoradiation because of paravaginal infiltration that was found in MRI (Figure 2A and 2B). A complete response was achieved according to MRI and pelvic examination one month after completion of chemoradiation.

## Discussion

Vaginal cancers are staged clinically, and the International Federation of Gynecology and Obstetrics (FIGO) staging system (2009) is the current system used for clinical staging (12). Vaginal tumors may invade locally and disseminate by several routes. Direct extension occurs to pelvic soft-tissue structures: paravaginal tissues, parametrium, bladder, urethra, and rectum. Tumors of the anterior vaginal wall may involve the vesicovaginal septum, bladder and urethra. Posterior wall tumors may involve the rectovaginal septum and rectum. Local primary disease assessment requires a very careful gynecological examination, if possible by more than one physician, and it may need general anesthesia if the patient is in pain or discomfort. The site of the tumor within the vagina, the macroscopic characteristics (exophytic and/or ulcerative growth etc.), and any regional spread outside the vagina must be carefully assessed and documented. FIGO 2009 Vaginal Cancer Staging system allows the use of chest radiographs, examination under anesthesia with bimanual and rectovaginal examination, cystoscopy and/or proctoscopy (in patients with urinary or rectal symptoms), and intravenous pyelogram to evaluate hydronephrosis (13).

As in cervical cancer staging, FIGO encourages the use of advanced imaging modalities, such as CT, MRI, and PET to guide therapy, but the imaging findings cannot be used to change or reassign the stage (13). As a result of its superior soft-tissue resolution, MRI is particularly useful in delineating tumor size and extent, and it is more sensitive than physical examination in assessing paravaginal or parametrial involvement in women with cervical cancer (14,15). Primary vaginal tumors are best visualized on T2- weighted images and appear hyperintense (16). Visualization of the vaginal tumor is enhanced with the instillation of vaginal gel or a dry vaginal tampon, which distends the vaginal walls and allows for assessment of the tumor thickness (17). In stage I cancer, the carcinoma is limited to the vagina, and the paravaginal fat remains of high signal intensity on T1-weighted images. In stage II cancers, the normal low-signal-intensity vaginal wall cannot be identified, and the paravaginal fat is of abnormal low signal intensity on T1, best seen on axial images. In stage III cancers, the carcinoma extends to the pelvic sidewall with disruption of the normal low signal intensity of pelvic sidewall muscles on T2-weighted images. In stage IV cancers, the carcinoma extends beyond the true pelvis or invades the rectum or bladder with resulting loss of the normal low-signal-intensity rectal or bladder wall on T2-weighted images (18). MR imaging is also useful in recurrent cancers (19).

In our cases, we used water-based gel for better imaging of the vaginal tumors. Magnetic resonance (MR) imaging of female pelvic cancers (cervical, vaginal and endometrial) can be complicated by the collapse of the vagina which makes it difficult to delineate tumor margins and extension with respect to the different walls

and segments of the wall of the vagina. Visualization of the internal contours of the cervix, vaginal wall and fornices can be improved by distending them using a tampon or other solid object. But the presence of a solid material such as a tampon may artificially deform the adjacent structures and adjacent air could cause significant susceptibility artifact. Previous studies have suggested filling the vagina with a combination of barium and water, with or without maltodextrin/ calcium lactate, is an effective way to outline the cervix and vaginal mucosa. However, this preparation can be time consuming to implement. The injection of water-based gel generally adds only a few minutes to the patient preparation time.Additionally, ultrasound gel is routinely used safely for sonography without significant adverse events (20). Atcı *at al.* compared 9 cervical cancer patients staged with MRI (all of the 9 patients had MRI scan both without vaginal gel instillation and with filled gel to vagina) and final histopathological results were revealed. MRI without using ultrasound gel was able to stage 44.4% of the patients correctly. In contrast, MRI with vaginal ultrasound gel was able to stage 100% of the patients correctly compared with final histopathology (21).

Finally, although primary vaginal cancer is staged clinically, pelvic MRI performed with vaginal water-based gel can demonstrate tumor infiltration to paravaginal tissues better than physical examination that helps well-directed management of this rare gynecological cancer.

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