Primary vaginal adenocarcinoma unrelated to in utero exposure to diethylstilbestrol (DES) is very uncommon. We report a case of 65-year-old Japanese woman who presented with primary adenocarcinoma in the anterior wall of the vagina, where the left ureter-like metanephric duct remnant abnormally terminated. Histological examination in serial sections revealed the direct connection between the carcinoma and the metanephric duct remnant. Moreover, the remnant epithelium showed varying degrees of dysplastic changes, including carcinoma in situ in close proximity to the carcinoma. This patient also had a bicornate uterus and left renal aplasia. To our knowledge, this is the first reported case of a primary vaginal adenocarcinoma arising from the metanephric duct remnant. Although the precise mechanism involved in carcinogenesis in this clinicopathological setting remains unknown, adenocarcinoma should be included in the differential diagnosis of vaginal tumors in patients with renal aplasia and/or an ectopic termination of the ureter or metanephric duct remnant, especially when the tumor is in the anterior wall.

Key words  Vaginal adenocarcinoma · Metanephric duct remnant · Renal aplasia · Ureteral ectopia

Introduction

Primary adenocarcinoma of the vagina unassociated with in utero exposure to diethylstilbestrol (DES) is rare [11, 17]. It often poses diagnostic problems and must be differentiated from metastatic adenocarcinomas, most frequently from the endometrium, cervix and the gastrointestinal tract and occasionally from the breast [17]. Moreover, unlike clear cell adenocarcinoma in women exposed to DES [3, 7], its accurate histogenesis remains obscure. Some adenocarcinomas have been reported to originate possibly from adenosin [12, 17], endometriosis [1], or cloacal remnants [2]. Rare paravaginal wolffian duct (mesonephros) adenocarcinoma also has been described [4].

We report the first case of primary vaginal adenocarcinoma arising from the metanephric duct remnant in a patient without in utero exposure to DES. The ureter-like metanephric duct remnant had an ectopic termination in the vaginal wall at its distal end, where papillotubular adenocarcinoma arose from. This patient also showed left renal aplasia and a bicornate uterus.

Clinical history

A 65-year-old nulliparous woman was referred to Miyazaki Medical College Hospital because of continuous vaginal bleeding which had lasted for three months before admission. She had menopause at the age of 50 and had been previously diagnosed at a nearby hospital as having the congenital aplasia of the left kidney and a bicornate uterus. There was no history of intrauterine exposure to hormones by maternal intake of DES or treatment with agents known to be estrogen modulators such as tamoxifen or danazol.

On examination with the colposcope, a dome-shaped protruding tumor 2 cm in diameter was found on the anterior wall of the vagina. Ectocervical cytologic evaluation led to classification as class V (Papanicolaou system), and the tissue biopsy specimen revealed adenocarcinoma. Vaginal endosonography and CT scanning revealed a bicornate uterus and normal-sized ovaries, the tumor being restricted to the vagina without evidence of intrauterine or abdominal spread. The right kidney and ureter were seen to be of normal size and shape on intravenous pyelogram. Gastroscopy and colonoscopy showed no evidence of malignant lesions.

The patient was treated by radical hysterectomy, bilateral oophorectomy, vaginectomy and bilateral pelvic lymph node dissection. During the operation, the left ureter-like cord-shaped structure was found between the urinary bladder and the left common il-
iac artery. At its cephalic end the cord-like structure was interrupt-
ed and merged into the retroperitoneal connective tissue around the
left common iliac artery. At its caudal end, the cord-like structure
did not go into the urinary bladder wall, but instead into the mid-
anterior wall (12° position) of the vagina. No other left ureter-like
structure was found on gross examination during the operation.

**Materials and methods**

The resected tissue were fixed in 10% formalin, routinely pro-
cessed, and embedded in paraffin. Sections were stained with he-
matoyxlin and eosin (HE) for light microscopic examination. Im-
munohistochemistry was perfomed on paraffin sections using an
ordinary biotin–streptavidin method. Monoclonal antibodies used
include those against cytokeratin 7, 8, 19 and 20 (Dako, Carp-
interia, Calif.), vimentin (Dako) epithelial membrane antigen
(EMA, Dako) and Leu-7 (Becton Dickinson, San Jose, Calif.).

**Pathological findings**

Grossly, there was a dark-red, dome-shaped, protruding
tumor with a maximum diameter of 2 cm in the anterior

![Image](image1.png)

**Fig. 1. a** Surgical specimen from hysterectomy and partial vagi-
nectomy, showing a protruded tumor mass (arrow) in the vagina.
The specimen was cut at the midposterior line (6° position). The
uterus shows bicornate features. **b** The anterior view of the hys-
terectomy specimen. The ureter-like, cord-shaped structure (arrow)
reaches to the anterior wall (12° position) of the vagina, just out-
side of the vaginal tumor. A sound in a and b shows the continuity
of the lumen of the ureter-like structure with the hole in the
middle of the vaginal wall.

![Image](image2.png)

**Fig. 2. a** The tumor tissue shows a papillotubular growth pattern.
An asterisk shows a central hole, which is continuous with the lu-
men of the left ureter-like tube structure. **Bar** 500 µm **b** Columnar
cells with large oval or elongated hyperchromatic nuclei prolif-
erate forming irregular papillae or tubules, which show a back-
to-back arrangement in part. **Bar** 50 µm

wall of the vagina in the surgical specimen (Fig. 1a). The
tumor had a small crater-like hole in its center. The uter-
us was bicornate. The left ureter-like structure reached to
the anterior wall of the vagina, where the tumor was lo-
cated (Fig. 1b). An examination with a sound revealed
that it opened to the vaginal lumen through the central
hole of the vaginal tumor.

Microscopically, the tumor had a predominantly pa-
pillotubular growth pattern (Fig. 2a). It consisted largely
of columnar cells with round to oval, hyperchromatic nu-
clei and macronucleoli (Fig. 2b). Nuclear stratification
and mitotic figures were occasionally seen. Portions of
the carcinoma cell-lined papillae and tubules showed a
back-to-back arrangement in part. The tumor infiltrated
deeply into the smooth muscle layer of the vagina, and
neither vascular nor lymphatic invasion was observed. In
addition, deep in the vaginal wall, ahead of the invasion