

## Stage IIB Carcinoma of the Uterine Cervix in a Patient with Bilateral Pelvic Kidneys: A Radiotherapeutic Challenge

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### SUMMARY

**Background:** The occurrence of invasive cervical cancer in a patient with a congenital pelvic kidney is a rare clinical condition that complicates the use of external beam radiotherapy to the pelvis for cervical cancer because the kidney(s) lies within the radiation field a situation associated with risk of radiation injury, nephritis and malignant hypertension.

**Objectives:** To report a case of a lady with stage 2B cancer of the cervix who has bilateral pelvic kidneys.

**Case:** A case of 45-year old para 6 lady with stage 2B cancer of the cervix and a bilateral pelvic kidney, she was managed with external beam radiotherapy (box technique), brachytherapy and chemotherapy. The pelvic kidneys were shielded from the radiation beam appropriately. Six years after treatment she was free of locoregional recurrence and distant metastasis, her blood pressure and renal function were normal.

**Conclusion:** Chemoradiotherapy was offered to this patient after shielding of the pelvic kidneys. All patients with cancer of the cervix or pelvic tumours should have a thorough abdominopelvic examination before treatment to rule out and prevent unintended radiation injury to the kidney(s).

**KEYWORDS:** Pelvic kidney, Cervical cancer, Chemo-radiotherapy, Radiation, Injury.

### Introduction

Cervical cancer is the second commonest cancer in Nigeria, it accounts for about 23.1% of female cancers in Ibadan, Nigeria.<sup>1</sup> Bilateral pelvic ectopic kidneys, are very rare and only few cases are reported in the medical literature.<sup>2</sup> The incidence of unilateral pelvic kidney has been estimated to be 1: 2100 – 3000 live births.<sup>3</sup> The presence of a pelvic kidney complicates the use of external beam radiotherapy because the kidneys lies within the radiation field. The normal location of the

kidney is outside the standard radiation field for cervical cancer, but a pelvic kidney is at risk of radiation injury and nephritis, condition associated with malignant hypertension which is often refractory to medical therapy and may require nephrectomy to save life.<sup>4</sup>

### Case Presentation

A 45-year old para 6+0 lady, she presented in June 2009 with 6 months history of foul smelling vaginal discharge and irregular vaginal bleeding associated with lower abdominal discomfort, poor appetite, weight loss and a diagnosis of stage 2B well differentiated mucinous adenocarcinoma of the cervix. She had no fever, urinary or faecal complains. She was not hypertensive or diabetic. Her blood counts and chemistry were normal, adominopelvic ultrasound scan revealed a bilateral pelvic kidneys, bulky uterus and a cervical mass. On account of the

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ectopic kidneys she had an intravenous urography (IVU) (patient could not afford pelvic CT or renal isotope scan) that showed renal calyces in the lower abdomen overlying the sacral bones, with slight blunting of the calyces on both sides. The renal pelvis and ureters were normal, the urinary bladder was also normal. Because of the advanced stage of the disease surgery was not an option instead she was offered a pelvic radiotherapy with exclusion (lead shielding) of the kidneys from the radiation field together with six cycles of combination chemotherapy using intravenous low dose cisplatin 50mg/m<sup>2</sup> and 5 Fluorouracil 800mg/m<sup>2</sup> every three weeks. She received external beam radiotherapy to the pelvis 50Gy in 25 daily fractions over 5 weeks (1.25MV photons of cobalt-60 Telecobalt) using parallel antero-posterior and lateral opposing fields. After two weeks rest and weekly observation of renal function, complete blood counts and performance status, she had 12Gy in 3 fractions of high dose rate (HDR) brachytherapy (HDR cobalt-60) source using tandem and ring. During the course of treatment she experienced dysuria and frequency of micturation due to radiation induced cystitis, these symptoms resolved with the used of high dose Vitamin C, urinary alkalisation with oral potassium citrate and liberal fluid intake.

After six years of follow-up, she had good disease and blood pressure control. Blood chemistry and counts were within normal limits.

### Discussion

The kidneys are normally located at T12 to L2 vertebral levels, the normally located kidney is spared exposure to radiation in the treatment fields for cervical cancer. Because renal tolerance is 15-20Gy, an anticipated full course of pelvic irradiation for cervical cancer that is 50-65Gy would render a pelvic kidney useless.<sup>5</sup> Mobilization of both kidneys out of the pelvis is limited by short ureteral length and possibility of damage to aberrant vessels

which could put the kidneys at risk of potential loss of function. We found few cases of simultaneous occurrence of cervical cancer in patients with pelvic kidney(s) in the literature, each case was managed differently to achieve the same goal.

Ripley et al, reported a case of stage IB adenocarcinoma of the cervix with a single functioning cadaveric renal allograft that was located in the pelvis, pelvic radiotherapy was delivered with anterior and posterior radiation fields to a modified field that excluded the transplanted kidney and common iliac arteries, followed by brachytherapy using an intracavitary tandem and ovoids insertion. The total dose received by the transplanted kidney was calculated to be 6Gy to the lower pole and 2Gy to the upper pole,<sup>6</sup> this dose is below the tolerance of the kidney(s) (15-20Gy).

Roth et al, reported a case of bilateral pelvic kidneys and stage IIB cervical cancer, the patient had an anterior exenteration without vaginal reconstruction and a distal ileal urinary conduit was performed. The patient had complete resection of the central tumour. The lymph nodes were negative, so her condition did not require adjuvant treatment. But the surgery was complicated by a left ureteroileal anastomotic leak that required re-operation on 2 occasions and consequently left nephrectomy.<sup>7</sup>

Bakri et al, reported a case of stage IIB cervical cancer that was complicated by ectopic pelvic kidney, they performed radical hysterectomy and pelvic lymphadenectomy with resection of the distal ureter and ureteric re-implantation into the urinary bladder using the Boari-flap technique. After the procedure, the patient received adjuvant chemotherapy without radiotherapy.<sup>8</sup>

Lataifeh et al, reported a case of stage IIB cervical cancer in a patient with a left ectopic pelvic kidney that was treated with pelvic



chemoradiation. The right kidney was however normal in location. Renal isotope scan showed 79% and 21% function in right and left kidneys respectively. Because the right kidney was fully functional and outside the pelvis while the left kidney was only partially functional, she had full course radiotherapy and cisplatin based chemotherapy with curative intent without shielding, thus sacrificing the left kidney.<sup>9</sup>

Abouna et al, reported a case of advanced cervical cancer 9 years after successful kidney transplantation. The transplanted kidney was removed from the pelvis and placed in the upper abdomen in the left renal fossa and was revascularized with the splenic artery and the left renal vein.

Radiation therapy was given to the pelvis without fear of radiation injury to the transplanted kidney<sup>10</sup>

The index patient has two functional ectopic kidneys. Mobilization outside the pelvis was not attempted due to short ureteral length and can put both kidneys at risk of potential loss of function.

Total abdominal hysterectomy (TAH) was also not an option because of locally advanced disease. Another option was the use of neoadjuvant chemotherapy to downstage the disease followed by radical hysterectomy and pelvic lymphadenectomy but this will require pre and post treatment positron emission tomography (PET) to adequately define any residual or metastatic disease, however PET scan is not available and may not be affordable to our patient. We therefore treated her with external beam radiotherapy, brachytherapy and chemotherapy.

The pelvic kidneys were shielded from the radiation beam anteriorly and posteriorly.

### Conclusion

A culture of routine pre-treatment work-up of patients with pelvic cancers with a minimum of Ultrasonography (it is cheap and readily available) of the pelvis and abdomen among other tests is encouraged and might save patients with pelvic kidney(s) from irradiation of the kidney(s) and its attendant complications.

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