

Case Report

Prostate brachytherapy seed migration to a left varicocele

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ABSTRACT

**PURPOSE:** To report a rare case of seed migration to a left varicocele after transperineal interstitial prostate brachytherapy with loose iodine-125 (<sup>125</sup>I) seeds.

**METHODS AND MATERIALS:** A 73-year-old man presented with a serum prostate-specific antigen level of 5.21 ng/mL, Gleason score of 7 (3 + 4), and clinical T1c adenocarcinoma of the prostate. The patient underwent transperineal interstitial prostate brachytherapy with loose <sup>125</sup>I seeds followed by external beam radiation therapy. Two weeks after seed implantation, a followup pelvic radiograph was obtained. One month after seed implantation, a pelvic computed tomography scan for postimplant dosimetric analysis was carried out. Subsequent ultrasound examination of the scrotum was undertaken.

**RESULTS:** Two weeks after seed implantation, an anteroposterior pelvic radiograph showed that a migrated seed was overlapped by the scrotum. Postimplant pelvic computed tomography revealed that a seed had migrated to the left side of the scrotum. Subsequent ultrasound examination of the scrotum revealed that the patient had a left varicocele to which the seed had migrated. The patient had no symptoms related to the migrated seed.

**CONCLUSIONS:** This is the first report of seed migration to a left varicocele after transperineal interstitial prostate brachytherapy with loose <sup>125</sup>I seeds. For the present case, we suggest that the seed moved from the prostate to the left varicocele through the pelvic veins, bypassing the systemic circulation. © 2012 American Brachytherapy Society. Published by Elsevier Inc. All rights reserved.

Keywords:

Brachytherapy; <sup>125</sup>I; Migration; Prostate cancer; Seed

Introduction

Seed migration is a recognized event that occurs after transperineal interstitial prostate brachytherapy, and it is observed more often with loose seeds than with linked seeds (1–5). It is well known that the most frequent site of seed migration is the lungs. Rare cases of seed migration to a coronary artery, the right ventricle, the liver, the kidneys, Batson's vertebral venous plexus, and the left testicular vein have been reported (6–14). However, to date, no cases of seed migration to a varicocele have been reported. Here, we report the first case of seed migration to a left varicocele.

Case report

A 73-year-old man presented with a serum prostate-specific antigen level of 5.21 ng/mL, Gleason score of 7 (3 + 4), and clinical T1c adenocarcinoma of the prostate. The patient underwent transperineal interstitial prostate brachytherapy with loose iodine-125 (<sup>125</sup>I) seeds followed by external beam radiation therapy (EBRT). The prescribed doses of brachytherapy and EBRT were 110 Gy and 45 Gy in 25 fractions, respectively. The preimplant prostate volume by transrectal ultrasound was 23.9 cc. The <sup>125</sup>I source strength was 12.1 MBq per source, and 56 seeds were implanted.

Immediately after seed implantation, a fluoroscopic pelvic image showed no migrated seeds. Two weeks after seed implantation, an anteroposterior pelvic radiograph showed that a migrated seed was overlapped by the scrotum (Fig. 1). One month after seed implantation, pelvic computed tomography (CT), which was performed for postimplant dosimetric analysis, showed that the seed had migrated to

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Fig. 1. Two weeks after seed implantation, an anteroposterior pelvic radiograph shows that a migrated seed is overlapped by the scrotum (arrow).

the left side of the scrotum (Fig. 2). Subsequent ultrasound examination of the scrotum showed a dilatation of the left pampiniform plexus, to which the seed had migrated (Fig. 3). The ultrasound examination also showed retrograde flow in the left pampiniform plexus and its drainage veins. In contrast, the right pampiniform plexus was not dilated. The patient was diagnosed with a left varicocele. The patient was informed of the seed migration to the left varicocele. He had no symptoms related to the migrated seed.

Postimplant dosimetric evaluation was performed with a treatment planning system (VariSeed 7.1; Varian Medical

Systems, Palo Alto, CA). The prostate and bilateral testes were contoured on CT images. A dose–volume histogram was generated. The postimplant prostate volume by CT was 26.9 cc. The postimplant prostate  $D_{90}$  (minimal dose delivered to 90% of the volume) and  $V_{110\text{ Gy}}$  (percentage of the volume that received a dose equal to or greater than 110 Gy) were 133 Gy and 96.8%, respectively. The postimplant volumes of the left and right testes by CT were 14.3 cc and 12.8 cc, respectively; the postimplant  $D_{100}$ ,  $D_{95}$ ,  $D_{90}$ ,  $D_{30}$ ,  $D_{10}$ , and  $D_5$  of the left testis were 0.44 Gy, 0.69 Gy, 0.88 Gy, 6.49 Gy, 16.1 Gy, and 29.3 Gy, respectively; the postimplant  $V_{30\text{ Gy}}$ ,  $V_{20\text{ Gy}}$ ,  $V_{10\text{ Gy}}$ ,  $V_5\text{ Gy}$ ,  $V_3\text{ Gy}$ , and  $V_1\text{ Gy}$  of the left testis were 4.59%, 7.63%, 18.0%, 38.3%, 54.7%, and 86.6%, respectively; the postimplant  $D_{100}$ ,  $D_{95}$ ,  $D_{90}$ ,  $D_{30}$ ,  $D_{10}$ , and  $D_5$  of the right testis were 0.17 Gy, 0.26 Gy, 0.29 Gy, 0.67 Gy, 1.02 Gy, and 1.27 Gy, respectively, and the postimplant  $V_{30\text{ Gy}}$ ,  $V_{20\text{ Gy}}$ ,  $V_{10\text{ Gy}}$ ,  $V_5\text{ Gy}$ ,  $V_3\text{ Gy}$ , and  $V_1\text{ Gy}$  of the right testis were 0.00%, 0.00%, 0.00%, 0.00%, 0.00%, and 10.7%, respectively. These results include the effects of irradiation from the seeds that had been implanted to the prostate and the seed that had migrated to the left varicocele but do not include the effect of irradiation during EBRT.

## Discussion

We report the first case of seed migration to a left varicocele after transperineal interstitial prostate brachytherapy with loose  $^{125}\text{I}$  seeds. Although this case may be similar to a case of seed migration to the left testicular vein that was

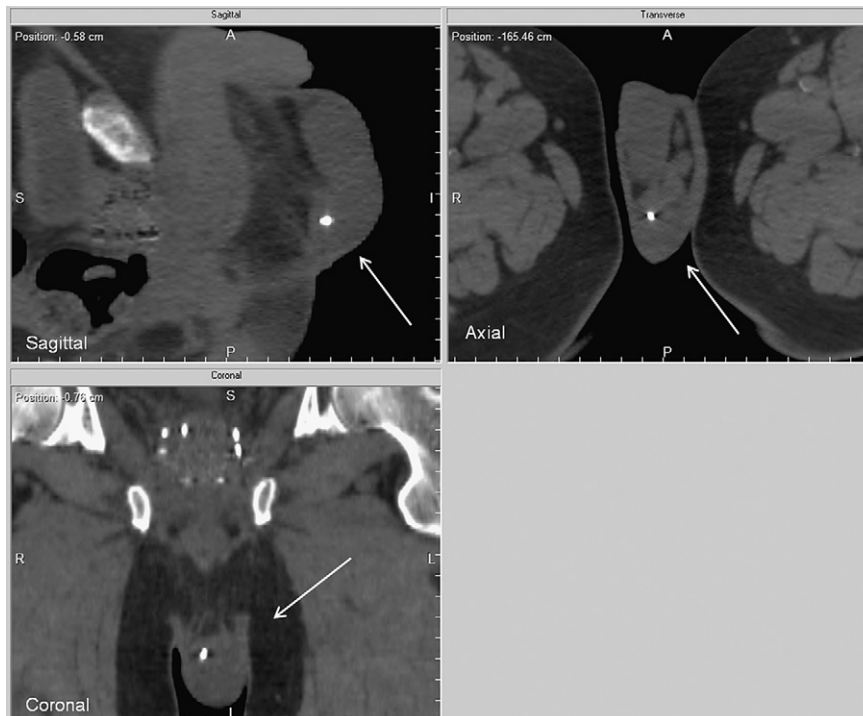


Fig. 2. One month after seed implantation, pelvic computed tomography shows that a seed migrated to the left side of the scrotum (arrows).

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