



## Oncology

# The Initial Case Report: Salvage Robotic Assisted Radical Prostatectomy After Heavy Ion Radiotherapy



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## ABSTRACT

Salvage radical prostatectomy is one of treatments after radiation therapy to patients with prostate cancer. To date, no case of the salvage robotic assisted radical prostatectomy (RARP) following heavy ion radiotherapy (HIRT) has been published. We report on a 70-year-old man with a history of HIRT for prostate cancer in 2011. For 3 years after HIRT, his serum PSA levels were permissible range. However, his PSA levels were increased. We had diagnosis localized prostate cancer after HIRT. We had carried out salvage RARP. Until 10 months after salvage RARP, his PSA level was not detectable.

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## Introduction

HIRT is one of treatments for localized prostate cancer. PSA recurrent rate after HIRT is very low for patients with prostate cancer.<sup>1,2</sup>

But small number of patients with prostate cancer, who had undergone HIRT, had metastatic lesions and/or local recurrent. On the other hand, salvage radical prostatectomy after HIRT is thought that it was very difficult because of adhesions and degenerations around the prostate. However, a few recent reports have suggested that RARP as salvage operation is very useful after radiation therapy and/or brachytherapy and/or hormone therapy for localized prostate cancer. But there is no reports about salvage operation after HIRT not only open radical prostatectomy but also RARP.

Here, we report a first case of recurrent prostate cancer after HIRT treated with salvage RARP.

## Case report

A 70-year-old man had undergone transrectal biopsy of the prostate in 2009. At that time, his serum PSA level was 6.64 ng/mL. Pathological findings were Adenocarcinoma, Gleason score 4 + 4, from one of 10 sites. Both computed tomography and bone scan showed that there were no metastatic lesions, we had the diagnosis of the T1cN0M0 prostate cancer. The patient had undergone HIRT (57.6 GyE/16f) for localized prostate cancer in 2010, National Institute of Radiological Sciences, Research Center Hospital for Charged Particle Therapy, Chiba.

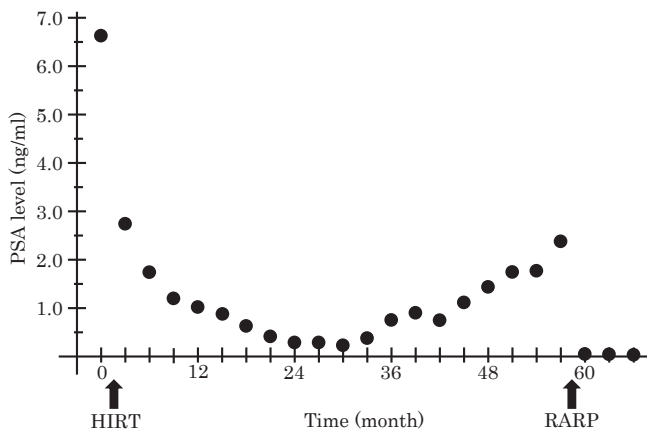
After HIRT, patient was followed it up at Department of Urology, National Hospital Organization, Tokyo Medical Center, Tokyo. For 2-years after HIRT, he had hormone therapy as maximum androgen blockade. His first 3.5-years of following periods, his serum PSA level was stable, but a biochemical progression was found in October 2014 (Fig. 1). A computed tomography, magnetic resonance imaging, bone scan and positron emission tomography showed no metastatic lesions. For histological confirmation, template needle biopsies of the prostate were carried out in November 2014. The pathological findings was that 6 of 34 biopsy sites were cancer positive sites, which were Adenocarcinoma, Gleason score 4 + 3 (Fig. 2). We had the diagnosis of the localized prostate cancer after

*Abbreviations:* RARP, Robotic assisted radical prostatectomy; HIRT, Heavy ion radiotherapy; UCG, Urethro-cystography; UR, Urethra.

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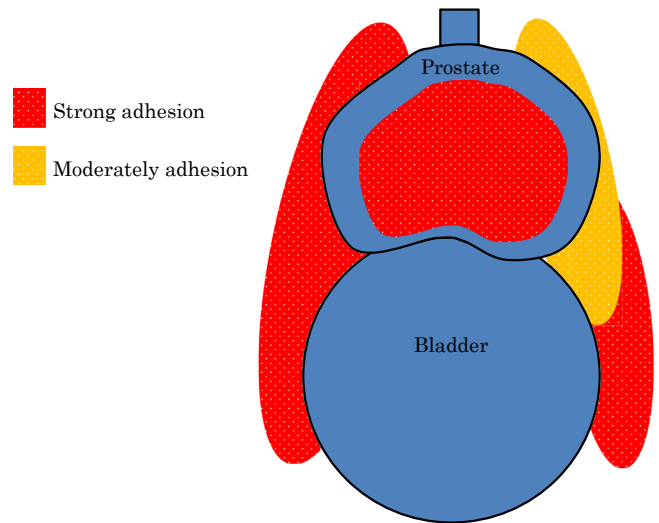


**Figure 1.** Patient serum PSA level before and after HIRT. His serum level before HIRT was 6.64 ng/mL. The biochemical progression was found in 60 months after HIRT.

HIRT. Thus we showed hormone therapy or salvage RARP as a cure to the patient. He chose the salvage RARP after having understood that it was difficult enough.

January 2015, we carried out salvage RARP. The RARP was carried out 6 ports trans-peritoneal approach.<sup>3</sup> The dividing of the vesico-prostatic junction was carried out with lateral approach technique as our usual manner. Bilateral neurovascular bundles were not sparing. The operation time and console time were 3 h 44 min and 3 h 9 min, respectively. The blood loss was 100 mL.

The operation findings were followed (Fig. 3); the anterior of the prostate was very strong adhesive. It took a lot of time before we recognized pubic bone. However, the dividing of the fat tissue in front of the prostate was easy. The right side of the prostate was moderately adhesive, but the left side was very strong adhesive. Bilateral external iliac veins lesions were very strong adhesive. The degenerative tissues involved external iliac vein, we abounded to the obturator nerve lymphnodes dissection, bilaterally. The adhesion of the left external iliac vein area was stronger than the right side one. But it was not so hard to recognize and incise the endopelvic fascia, bilaterally. The dividing of the vesico-prostatic junction was easy with lateral approach. The bladder neck sparing



**Figure 3.** Operative findings at the salvage RARP. Red and yellow area were strong and moderately adhesion area, respectively. There was not any adhesion in the posterior side of the prostate.

carried out easy without bladder neck reconstruction. The posterior dividing, we thought that this step was most difficult step in this operation, was easy and carried out smooth. The bilateral dividing of the prostatic pedicles was carried out easy. There was no adhesion around the urethra and apex of the prostate. The vesico-urethral running suture carried out as a usual manner followed by Rocco's stiches, anterior suture and bladder neck suspension suture carried out finally. These sutures were carried out with 3–0 Monocryl. 14Fr. Foley catheter was introduced to the bladder, 10 mm flat silicon drain was introduced to the pelvic cavity through the 12 mm Air-seal port.

The 5 days after RARP, the urethro-cystography (UCG) carried out, UCG showed that there was no leakage.

The urinary incontinence was little after removed Foley catheter without acute urinary retention. He discharged the hospital on the 9 days after RARP.

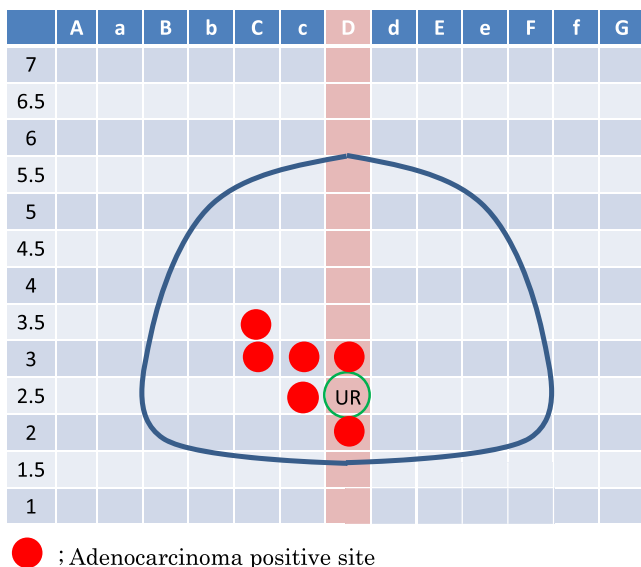
Pathological findings after salvage RARP was Adenocarcinoma, Gleason score 4 + 5, ly1, v0, pn1, sv0, pT3a. His serum PSA level was undetectable from 1 month though 10 months after salvage RARP (Fig. 1). There was no urinary incontinence and complications.

**Discussion**

Salvage surgery for prostate cancer patients who underwent hormone therapy and/or radiation therapy is very difficult because of adhesion and/or degeneration and/or complication. In addition, salvage prostatectomy after HIRT is thought that it is very difficult.

This case is first report in the world, salvage RARP after HIRT, so it is very difficult to discuss about this case. But, it is important to prepare the methods of salvage operation for patients with prostate cancer following radiation therapy and/or hormone therapy as well as HIRT in the urologists. This case was not so difficult through the salvage RARP except for posterior side of the prostate, fortunately. HIRT is one of treatments for localized prostate cancer, but a few patients after HIRT were PSA recurred. In these patients, RARP is the one of the treatments as salvage operation.

However, I have over 700 experiences of RARP, we considered that this case would be difficult for success. So we contacted Kunihiko Yoshioka M.D. in Shin-Yurigaoka General Hospital for the supervisors. So I could perform the operation with adequate



**Figure 2.** Positive site of template needle biopsies.

discussions all through the operation time. I thanks to him on this paper.

#### **Conflicts of interest**

The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

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