Urology Case Reports 41 (2022) 101982

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

A case of cystic mucinous adenocarcinoma of the prostate treated by robot-assisted radical prostatectomy

Toyoshi Seito [a,*], Akira Ishikawa [a], Ibuki Tsuru [a], Masahiro Hikatsu [a], Yuan Bae [b], Yukio Homma [a]

[a] Department of Urology, Japanese Red Cross Medical Center, Tokyo, Japan
[b] Department of Pathology, Japanese Red Cross Medical Center, Tokyo, Japan

A B S T R A C T

A 66-year-old male visited with constipation. Intra-pelvic cystic mass (332 cm^3) was found, and PSA was 32.4 ng/ml. Biopsy of the prostate was performed. It wasn't adequate specimen for diagnosis, but the PSA of the fluid was 4791.0 ng/ml. RARP was performed. To make surgical field more visible, fine needle was stuck from the patient's perineum into the cyst intraoperatively. The patient was discharged with nothing complications. It was mucinous adenocarcinoma of the prostate, pT3b, RM1. The patient is now receiving ADT but no recurrence and metastasis are seen to date.

1. Introduction

Prostate Cancer (PCa) is a highly prevalent disease around the world. Mucinous adenocarcinoma is very rare morphology, and there are limited cases of cystic PCa were reported.

Patients who have PCa with cyst formation are often symptomatic for lower urinary tract symptoms (dysuria in 56.2% and hematuria in 20.8%), more than half presented with metastatic cancer (54.1%) and almost all were diagnosed with secondary cyst formation (82.1%)[1)]. Thus, many cases are advanced at the time of detection, most patients must be treated with endocrine therapy.

Although robot-assisted surgery has been commonly used as a surgical treatment for PCa, open surgery has still been used to treat PCa with pelvic cyst formation. In this article, we report our experience of robot-assisted surgery for huge cystic mucinous adenocarcinoma of the prostate.

2. Case presentation

A 66-year-old man, no past medical history, was referred with constipation in June 2020. Abdominal Computed Tomography scan revealed intrapelvic cystic mass (332 cm^3), the rectum was pressed and no metastasis (Fig. 1). Magnetic Resonance Imaging of the prostate showed the nodular mass in T2 weighted imaging. The lesion's origin was suspected to be his prostate. The serum Prostate Specific Antigen (PSA) value was 32.4 ng/ml. The urine cytology was class 1 and cystourethral scope was normal findings. We performed *trans*-perineal ultrasound-guided needle biopsy of the prostate; we could not obtain adequate "tissue" specimen for diagnosis except intra-cystic dark-brownish sticky fluid. PSA of the fluid was 4791.0 ng/ml. The pelvic mass was diagnosed as cystic PCa. We performed Robot-Assisted Radical Prostatectomy (RARP) in July 2020.

It was done under general anesthesia using da Vinci X Surgical System (Intuitive Surgical, Inc., Sunnyvale, CA, USA). The intrapelvic mass was too bulky to see the surgical field (Fig. 2). To make surgical field more visible, an eighteen-gauge fine needle was stuck from his perineum into the cyst. Intracystic fluid amount of 500 ml was evacuated, and the surgical field was kept wide. Although adhesion was seen between the mass and the rectal wall, the operation was completed without any complications. It took 6 h and 15 min to complete all the procedure with bleeding amount of 800 ml.

Pathology revealed the mass was mucinous adenocarcinoma of the prostate, Gleason Score 4 + 5 = 9, Grade Group:5, EPE1, RM1, ly1, v0, pn1, sv1 and pT3b. Tumor infiltration was observed on the cyst wall, and mucus production was observed in approximately 30% of the lesions (Fig. 3). He was discharged on the 10th post-operative-day. The patient was followed without any postoperative complications, but hormone therapy was started due to elevated PSA (1.110 ng/ml) in December 2020. He is receiving androgen deprivation therapy using Gn-RH antagonist. His current PSA is 0.010 ng/ml, and no recurrence and metastasis are seen to date.

3. Discussion

Mucinous adenocarcinoma of prostate is one of the least common variants of PCa. They were diagnosed morphologically when at least

* Corresponding author. Department of Urology, Japanese Red Cross Medical Center, 4-1-22 Hiroo, Shibuya-ku, Tokyo, 150-8935, Japan.
E-mail address: sentkn@gmail.com (T. Seito).

https://doi.org/10.1016/j.eucr.2021.101982
Received 26 November 2021; Accepted 12 December 2021
Available online 16 December 2021

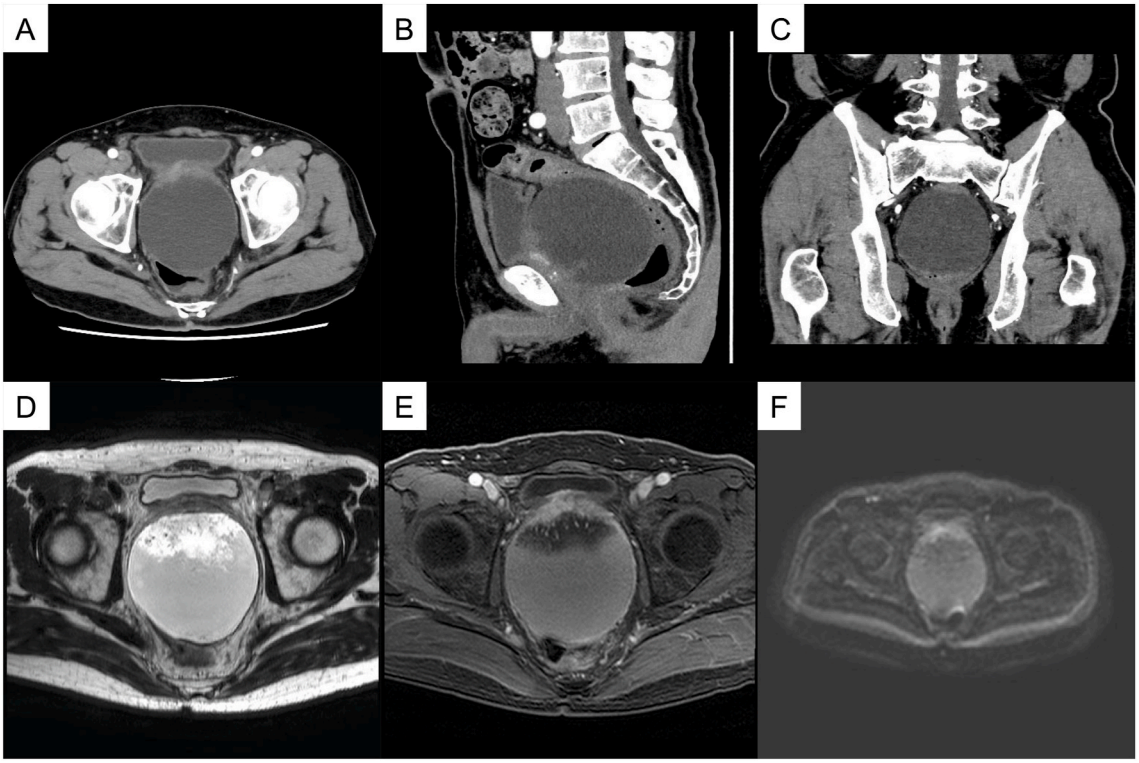

Fig. 1. Contrast enhanced computed tomography (CT) and magnetic resonance imaging (MRI) of the prostate. (A) axial (B) Sagittal (C) Coronal CT. The entire pelvic area is occupied by the cyst, and the rectum was compressed. (D) T2 weighted (E) Contrast enhanced T1 weighted (F) Diffusion-weighted. A mass volume of 85*83*90 mm was found in the pelvis. The dorsal side shows high signal on T2 weighted and T1 weighted.

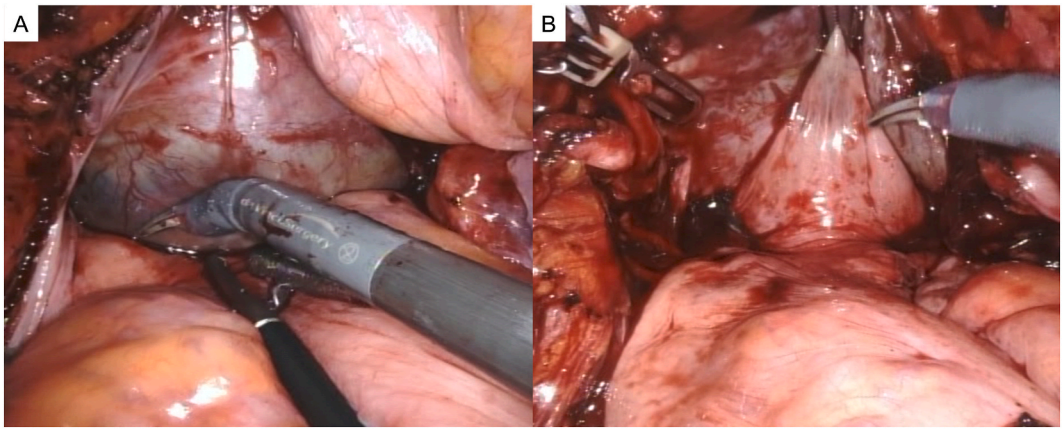

Fig. 2. Surgical field. (A) The surgical field was narrowed due to the cyst (B) By percutaneously puncturing and aspirating the cyst, it was possible to widen the surgical field.

25% of the resected tumor contained lakes of extracellular mucin, and an extra-prostatic tumor site was ruled out.

Although mucinous PCa was considered as a variant of high-grade before, recently it's found that mucinous PCa patients had similar survival progression in terms of cancer-specific survival and overall survival compared with those with typical PCa, and patients who underwent surgery had longer survival[2]. If signet ring cells were seen in the tissue, it would be high malignancy. Saito et al. divided 88 of mucinous adenocarcinoma of the prostate into 3 groups as follows: 60 cases of mucinous carcinoma, 11 cases of mucinous carcinoma with signet ring cells, and 17 cases of primary signet ring cell carcinoma and showed inferior prognoses among patients with signet ring cells (50%, 16.7%, 27.3% survived for three-years, respectively)[3]. It was confirmed that there were no signet ring cells present in this case.

The frequency of cyst formation in PCa is reported 0.32%[4]. Some of them were due to intra-tumor necrosis or hemorrhage. Previously, Popov et al. reported a case 45mm cystic PCa was diagnosed by percutaneous puncture and hormone therapy was followed by radical prostatectomy[5].

A feature of this case is that such a bulky mass was treated by robot-assisted laparoscopic surgery. Almost all mucinous lesion was evacuated by *trans*-perineal approach using needle without scattering in the intra-pelvic field. *Trans*-perineal approach to evacuate was highly effective to prevent perforation of the cyst fluid into the abdominal cavity although it might have some risks of dissemination to hypodermis. The shriveled small balloon-like prostate and the bladder were successfully separated without injuring bilateral ureteral orifice. The incision line between bladder and prostate could be made carefully using enough magnified

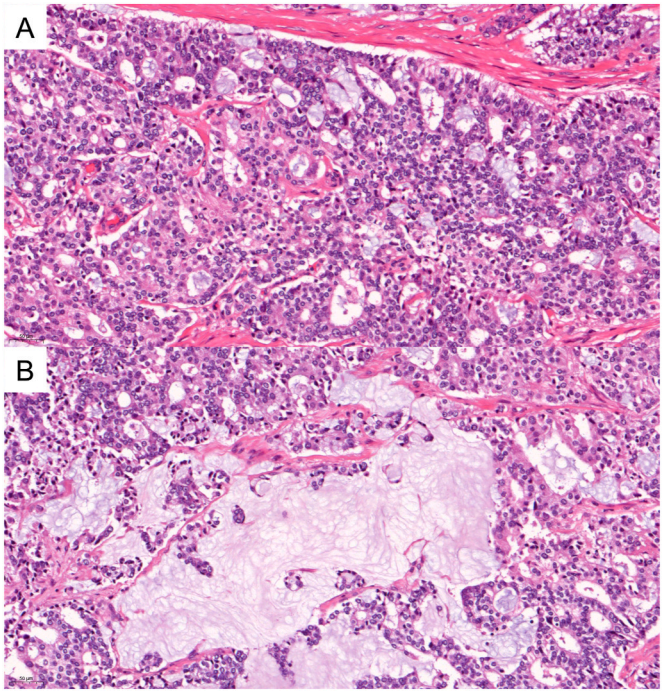

Fig. 3. Pathology of the prostate. (A) High power field of the tumor. Cancer cells form cribriform glands. (B) Some cancer cells have abundant extracellular mucin.

views offered by the three-dimensional camera. Bilateral seminal vesicles were detected easily, and it helped us to recognize the layer between prostate and rectum.

4. Conclusion

This PCa was detected by constipation although no dysuria was observed. The cyst formation was so massive that it was difficult to secure the field of view during robot-assisted surgery, but we managed to prevent cyst fluid from entering the abdominal cavity by performing intraoperative transperineal drainage. Drainage to minimize the size of the cyst might be an effective approach. RARP provides us to see better view to avoid injuries of surrounding essential organs and tissues. This ingenuity may extend the possibility of robot-assisted surgery of various pelvic organs.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

I have no conflict of interest with respect to this case report.

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