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Case Report

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Synchronous Triple Primary Malignancies Involving Three Different Organ Systems Managed with Robotic Surgery

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Abstract

Purpose: Triple synchronous primary malignancies involving three different organ systems are extremely rare. We report a case of synchronous primary malignancies involving the rectum and prostate along with lymphoma.

Case presentation: A 73 years male presented with rectal bleeding along with obstructive urinary symptoms. Colonoscopy confirmed the presence of an upper rectal malignant lesion which was subsequently confirmed as adenocarcinoma. Subsequent MRI showed the presence of a suspicious malignant prostatic lesion along with the early rectal cancer. A PSMA PET-CT showed intense uptake in the prostate mass and also showed multiple large lymph nodes in the iliac, paraaortic and mediastinal regions suspicious of lymphoma. Trans Rectal Ultrasound (TRUS) guided biopsy of the prostate was positive for adenocarcinoma. Neoadjuvant Androgen Deprivation Therapy (NA ADT) was started.

One week after NA ADT, the patient underwent Robotic Low Anterior Resection, Radical Prostatectomy and common iliac lymph node biopsy. Histopathology of low anterior resection showed pT2N0 well differentiated adenocarcinoma. Histopathology of prostatectomy showed pT3N1 acinar type adenocarcinoma. Histopathology and IHC (CD20 positive, BCL2 positive, CD5 positive, CYCLIN D1 positive and SOX-11 positive) of the common iliac lymph nodes confirmed it as Mantle cell lymphoma. Hormonal treatment for prostate cancer was continued and Chemotherapy for Mantle cell lymphoma was started 6 weeks after surgery.

Conclusion: This is the first report of triple synchronous primary malignancies that include Rectal cancer, Prostate cancer and Lymphoma. We have shown that Robot assisted surgery can be of great benefit in these challenging situations.

Keywords: Triple Synchronous Primary Malignancies; Rectal Cancer; Trans Rectal Ultrasound

Introduction

In 1889, Theodor Billroth described the first case of multiple primary malignancies [1]. The pathogenesis of multiple primary malignancies is complex and may be indicative of genetic susceptibility in some individuals. Some of the well-known examples include Lynch syndrome, Von Hippel Lindau disease and Li Fraumeni syndrome [2]. Additionally, cancer survivors may be prone to developing multiple primary malignancies due to the late carcinogenic effects of treatment modalities of previous cancers. Triple primary malignancies can be synchronous, metachronous or a combination of both. Studies have shown that among these three scenarios, triple primary synchronous malignancies are the rarest [3]. Cancers due to genetic susceptibility and prior cancer therapy are more likely to be metachronous in nature.

Multiple synchronous primary malignancies are defined as two or more primary malignancies diagnosed within 2 months period by the Survey, Epidemiology and End Results (SEER) project [4]. The International Association of Cancer Registries and International Agency for Research on Cancer (IACR/IARC) defined it as diagnosed within a 6 month period [5]. Synchronous multiple primary malignancies, especially three or more are rare [6-12]. The gastrointestinal tract, breast and lung have been the most common location of synchronous multiple primary malignancies [11]. The incidence of multiple cancers can be attributed not only to factors such as genetic defects, environmental problems, immunodeficiency, viral infections, carcinogenic effects of prior treatments and increased life expectancy but also due to increased health awareness and diagnostic modalities.

Case Report

A 73 years old male was initially evaluated for rectal bleeding. He had also noticed slow stream of urine recently. There was no history of any previous cancer treatment or cancers in the family. A colonoscopy revealed the presence of large upper rectal polypoidal growth of size more than 3 cm and few colonic polyps. Biopsy of the rectal growth showed high grade dysplasia. The other colonic polyps were removed by colonoscopic polypectomy and were subsequently reported as adenomatous polyps with low grade dysplasia. Serum CEA was within normal limits. An MRI Pelvis performed for staging showed the presence of a malignant localised lesion in prostate (Gleason score 4+3) in addition to T2 rectal growth. Trans Rectal Ultrasound (TRUS) guided biopsy of the prostate was performed. The prostate biopsy was positive for adenocarcinoma and serum PSA was elevated at 60.6. A PSMA PET-CT done for staging did not show any distant metastasis, but however in addition to lesions in rectum and prostate, showed multiple large lymph nodes in the iliac, paraaortic and mediastinal regions suspicious of primary neoplastic aetiology. With confirmed early rectal and prostate cancer and with multiple lymphadenopathy, plan was made for initial Neoadjuvant Androgen Deprivation Therapy (NA ADT) and subsequently for robotic low anterior resection, radical prostatectomy and retroperitoneal lymph node biopsy.

About 1 week after NA ADT, the patient underwent Robotic Low Anterior Resection, Radical Prostatectomy and common iliac lymph node biopsy. The surgery began with IMA ligation, rectal dissection and rectal division. Radical prostatectomy with vesico-urethral anastomosis was performed followed by common iliac lymph node biopsy. Finally, the circular stapled colorectal anastomosis was performed with defunctioning ileostomy. Due to the close proximity of vesico-urethral and colorectal anastomosis, there is a higher risk of fistula formation. In order to mitigate this risk an omental flap was placed between the two anastomosis and in order to reduce the risk further a faecal diversion was performed with a loop ileostomy.

The patient recovered well from surgery and was discharged on the fourth postoperative day with urinary catheter. Histopathology of low anterior resection showed pT2N0 well differentiated adenocarcinoma. Histopathology of prostatectomy showed pT3N1 acinar type adenocarcinoma. Histopathology and IHC (CD20 positive, BCL2 positive, CD5 positive, CYCLIN D1 positive and SOX-11 positive) of the common iliac lymph nodes confirmed it as Mantle cell lymphoma. Hormonal treatment for prostate cancer was continued post operatively and Chemotherapy for Mantle cell lymphoma was started 6 weeks after surgery (Fig. 1-5).

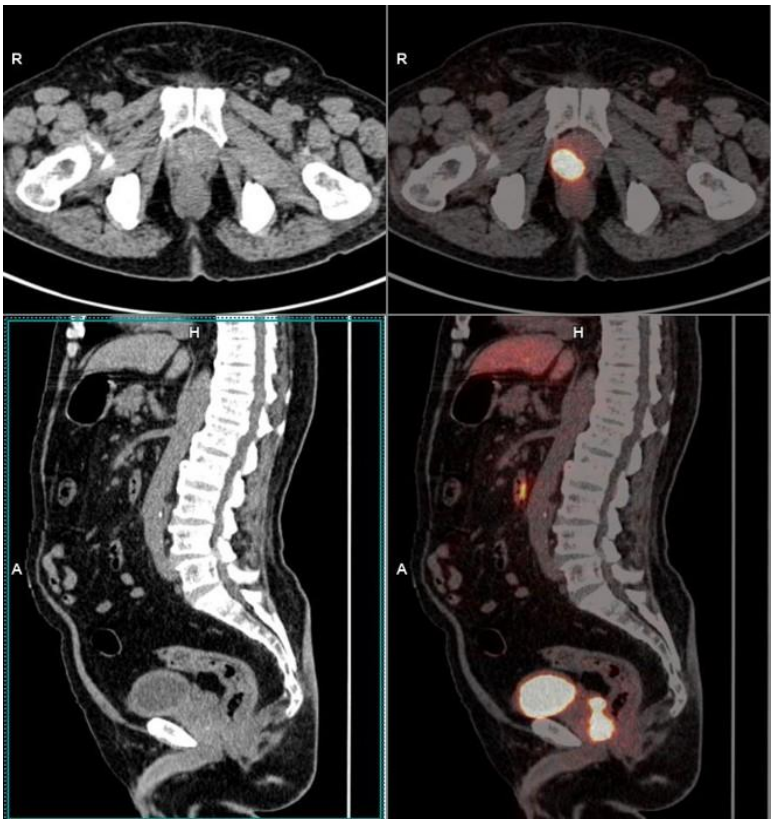

Figure 1: PSMA PET-CT showing the presence of malignant mass in the prostate with intense PSMA uptake and non-avid mass in the rectum.

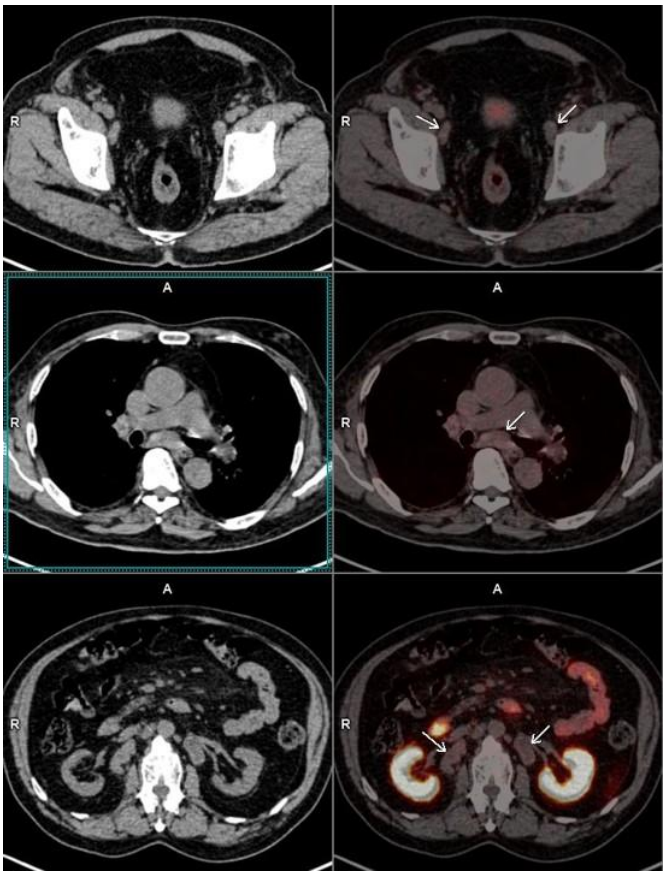

Figure 2: PSMA PET-CT showing multiple large non-avid lymph nodes in the iliac, paraaortic and mediastinal regions suspicious of primary neoplastic aetiology.

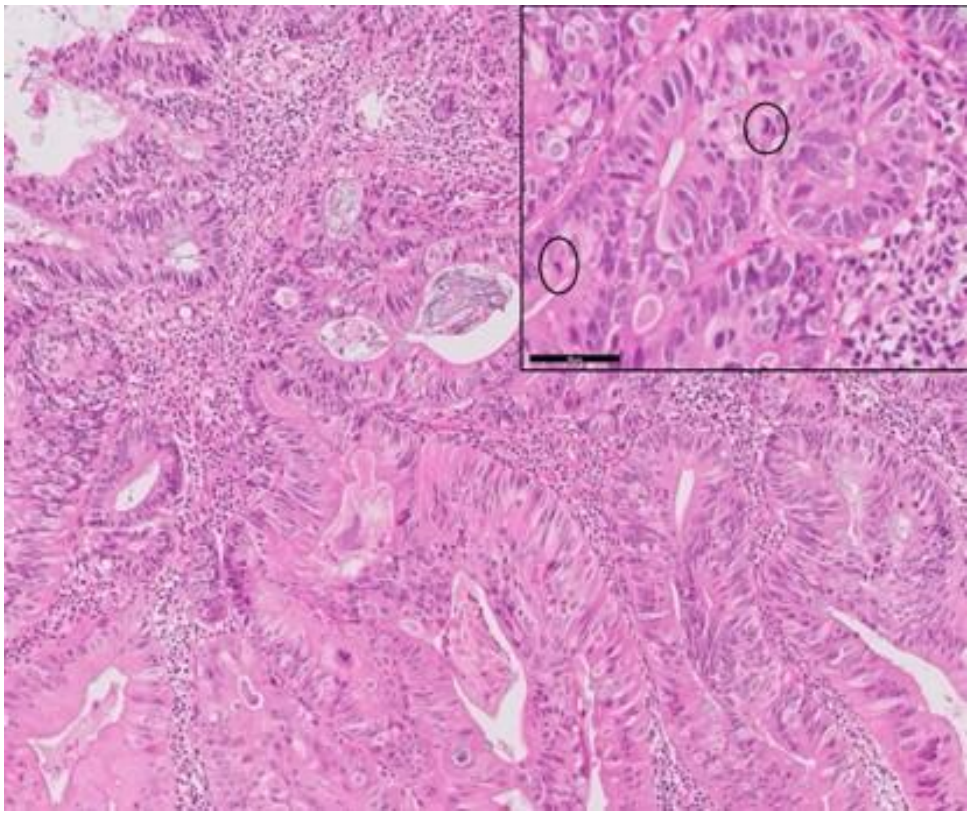

Figure 3: Tubuloglandular arrangement of tumor cells showing invasive component with increased mitotic activity confirming rectal adenocarcinoma.

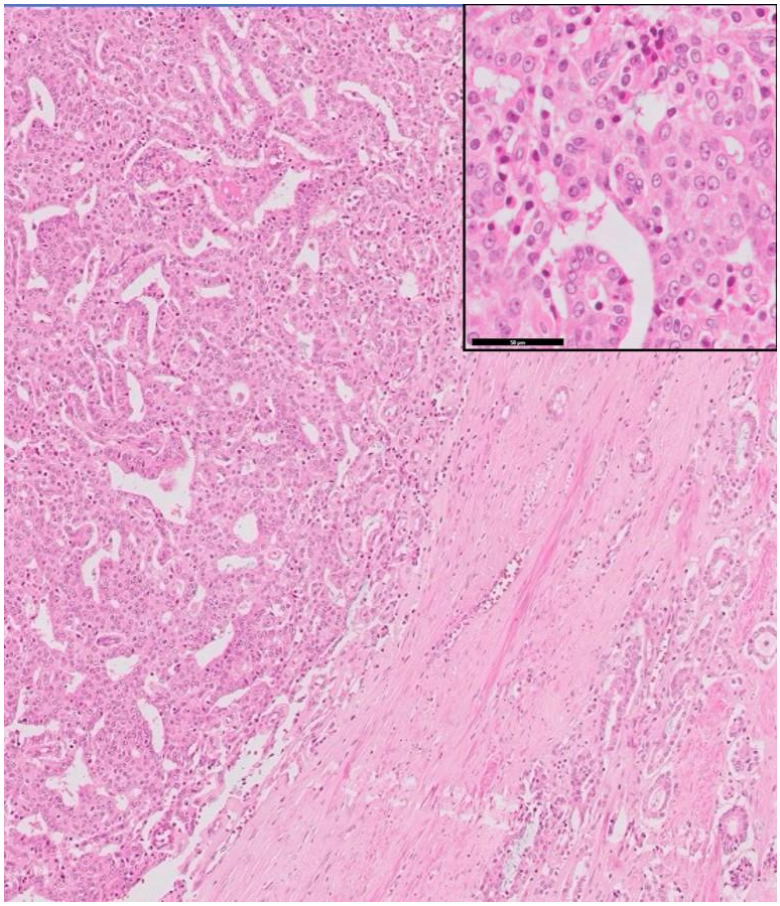

Figure 4: Prostatic acinar adenocarcinoma with adjacent benign prostatic glands and tumor cells showing prominent nucleoli.

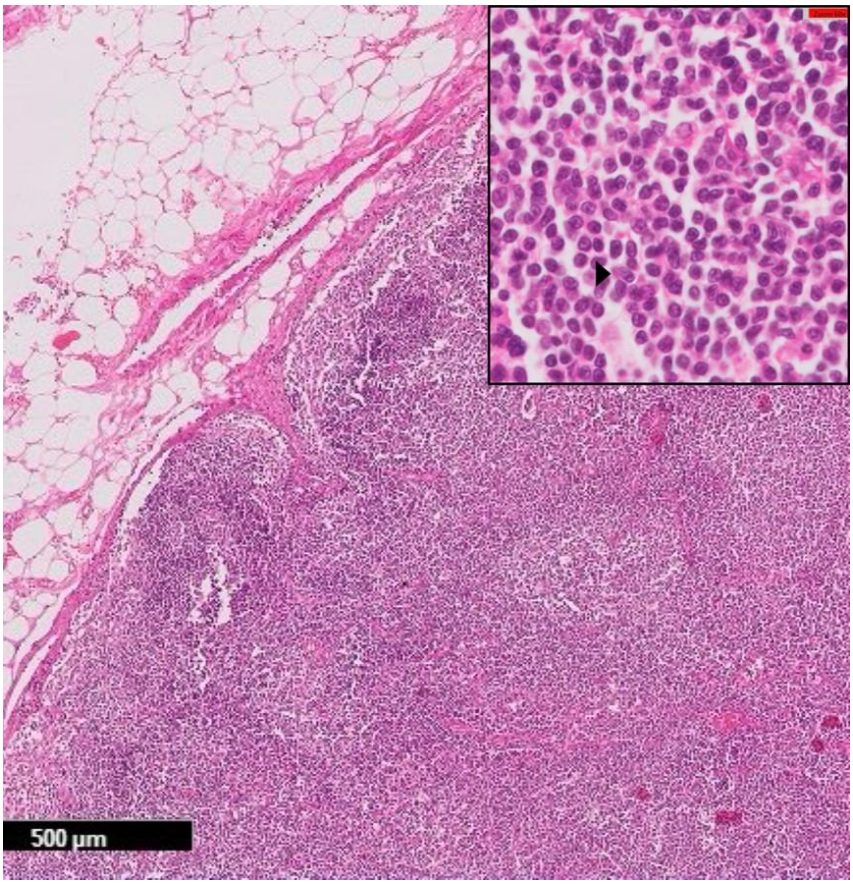

Figure 5: Lymph node biopsy showing nodular proliferation of a monotonous population of small lymphocytes with irregular (cleaved) nuclear membranes with IHC confirming Mantle cell lymphoma.

Discussion

While Rectal cancer, Prostate cancer and Lymphoma are common malignancies occurring worldwide, the synchronous detection of these three malignancies has not been reported in literature. There is no known genetic cancer syndrome that leads to synchronous or metachronous development of rectal cancer, prostate cancer and lymphoma. Our patient did not have the risk of any previous cancer treatment or any significant family history of cancer. Diagnosis of synchronous multiple primary malignancies may be difficult and one of these could be missed either by assuming them to be metastatic or by inadequate investigation by the practitioner in certain clinical situations.

Both prostate cancer and rectal cancer are among the most common pelvic cancers in men [13]. A thick layer called the Denonvillier's fascia lies between the rectum and prostate [14]. A prostate cancer invading the rectum can cause rectal related symptoms such as rectal bleeding and altered bowel habits. However, in our patient it was two separate malignancies in the prostate and rectum without any evidence of direct infiltration. As the rectal cancer was early stage upper rectal T2 lesion without any suspicious mesorectal malignant lymph nodes it a was clearly a case for upfront Low anterior resection without the need for any Neoadjuvant therapy. Considering the presence of synchronous localised biopsy proven prostate cancer it was decided that we will consider synchronous radical prostatectomy along with Low Anterior Resection.

Robot-assisted surgery offers several advantages compared to standard laparoscopic surgery. The Robot offers the use of a high-resolution camera with three-dimensional visualization. The Robotic arms along with the endo-wristed instruments allow surgeons to perform more precise dissection of anatomical structures particularly in narrow spaces like pelvis leading to better perioperative outcomes and functional preservation [15,16]. Robotic assisted Radical Prostatectomy (RARP) has been shown to be superior to laparoscopic and open techniques in terms of both functional and oncological outcomes [17]. The distinct technical advantages of Robot-assisted surgery can be useful in rectal cancer surgery. The REAL trial has shown that robotic surgery resulted in better oncological quality of rectal cancer resection than conventional laparoscopic surgery, with less surgical trauma and better postoperative recovery [18,19].

Multiple large lymph nodes were noted in the iliac, paraaortic and mediastinal regions suspicious of granulomatous or primary neoplastic aetiology rather than metastatic. Hence the decision was made to perform common iliac lymph node biopsy during the robot-assisted surgery of the rectum and prostate and the excised common iliac lymph nodes were sent for histopathology and IHC. Hence the diagnosis of mantle cell lymphoma from the lymph nodes was confirmed after surgery. While synchronous double malignancies involving either rectum or prostate along with lymphoma have been reported, there is no report of the occurrence of synchronous multiple primary malignancies involving all three reported here [20,21]. This is also the first instance of performing robot-assisted surgery in this kind of complex situation and we would like to drive home the point that robot-assisted surgery is likely to be the best approach in this scenario.

Conclusion

This is the first report of triple synchronous primary malignancy that includes Rectal cancer, Prostate cancer and lymphoma. Treatment decisions can be complex in these situations keeping in mind the best combined approach for managing all three cancers at the same time. These complex treatment decisions have to be taken with multi-disciplinary balanced approach to maximise the benefits and minimise the risks. We have shown that robot assisted surgery can be of great benefit in these challenging situations.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore was exempt.

Informed Consent Statement

Informed consent was obtained from all participants included in the study.

Authors' Contributions

All authors contributed equally to this paper.

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