Oncology Case Reports Journal

Case Report
Published: 16 Apr, 2020

Prostate Cancer and Locally Metastatic Pancreatic Cancer: A Case Report

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Abstract

Background: In the literature prostate cancer and pancreatic cancer are acknowledged among most common tumors with limited screening test, and requires further investigation to be able to make a definitive diagnosis.

Case Presentation: A 46 years old young man, who was found, early in life to have prostate cancer and further diagnostic test over a period of time reveal an additional locally metastatic pancreatic cancer. He has a family history of some cancer; hence by definition the patient could have a possible genetic risk of cancer.

Discussion: Based on diagnostic and other pathological investigations, suggestive management for patient include active surveillance for the prostate cancer and low doses of combined chemotherapy and radiotherapy for the pancreatic cancer, and we also recommend a follow up care into both conditions.

Keywords: Prostate cancer; Pancreatic cancer; Diagnosis; Active surveillance; Treatment options

Background

Prostate Cancer is the known to be common in males in the UK, recording about 26% of all new cancer cases in males; it is estimated in 2014, that 46,690 new case of prostate cancer was recorded in males in the UK [1,2]. Prostate cancer can be diagnosed with PSA testing, digital rectal examination and transrectal ultrasound guided biopsy with Gleason score to confirm biopsy; but the commonest method used is the PSA, because of it sensitivity, specificity positive and negative predictive value [3]. Studies have examine that the use of PSA can lead to over-diagnosis of prostate cancer [4,5].

Pancreatic cancer is also considered as the fourth leading cause of cancer-related death in the developed world [6]; but in the UK it is considered the 11th most common cancer with about 3% of all new cases [1,2]. Pancreatic cancer can be diagnosis with CA19-9 [7]. But other studies has shown that carbohydrate antigen 19-9 is not specific [7,8], because other pathological conditions can result in elevated level of CA19.9, leading to lower diagnostic accuracy to pancreatic cancer e.g. Benign hepatopancreaticobiliary conditions.

In this report we report a 46 years old man with initial diagnosis of pancreatic cancer and subsequent diagnosis of locally metastatic pancreatic cancer after a period of other laboratory investigations. Medical report indicates that patient has family history of some cancers shown in Table 1.

Case Report

A 46 years old Ashkenazi Jewish male decent referred for a routine Prostate Specific Antigen (PSA) investigation revealed elevated level of 20 ng/ml of PSA in patient blood in June 2016.

There was a family history of breast cancer and ovarian cancer diagnosed in his deceased mother at the age of 52. Triple negative breast cancer was diagnosed in his 43 years old sister who is still alive and in his deceased maternal grandmother at the age 62. Patient father, brother, maternal grandfather and paternal grandmother are all healthy and alive. His paternal grandfather died at age 79 with an unknown cause. Summary of family history is shown in the pedigree tree (Figure 1). In this same month (June 2016), digital rectal examination of this patient showed no evidence of prostate enlargement (negative). Patient had four transrectal ultrasound guided biopsies and mpMRI were performed. During this procedure, the ultrasound revealed an enlarge mass in the homogenous far anterior transition zone of the gland extending to the anterior fibromuscular stromal region (Figure

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Received Date: *23 Mar 2020*
Accepted Date: *14 Apr 2020*
Published Date: *16 Apr 2020*

Citation:
Gariba M, Struge J, Cawthorne C, Cawkwell L. Prostate Cancer and Locally Metastatic Pancreatic Cancer: A Case Report. Oncol Case Report J. 2020; 3(1): 1018.

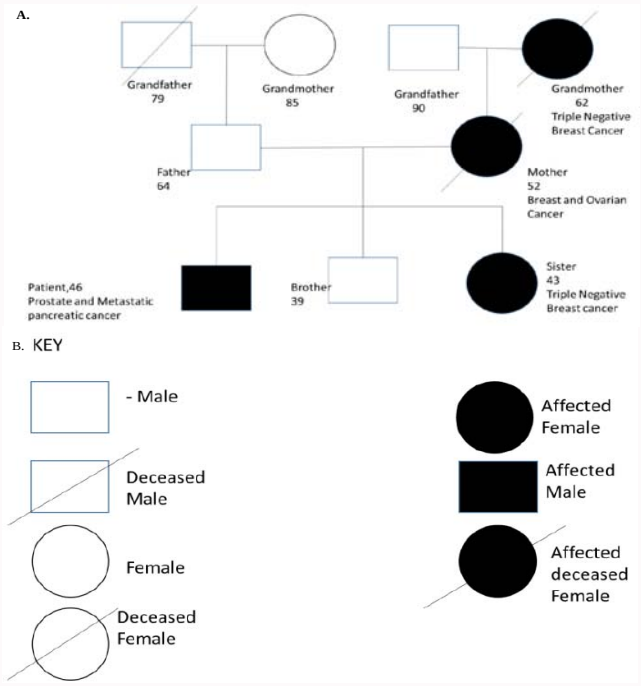

Figure 1: Ashkenazi Jewish male decent Pedigree Tree.

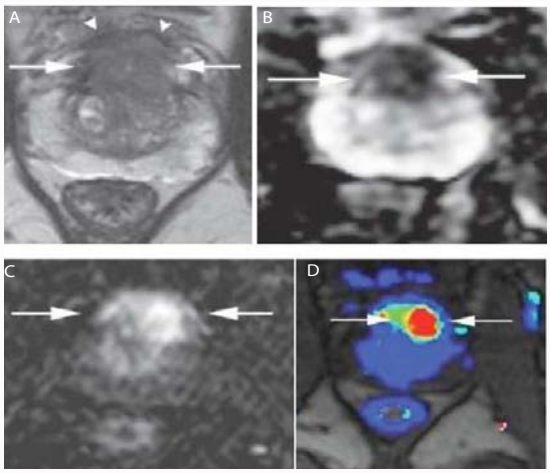

Figure 2: Patients Multiparameteric Magnetic Resonance Imaging (mpMRI). A 46-years old Ashkenazi Jewish Male decent with a PSA level of 20ng/ml and four negative transrectal ultrasound guided biopsies was referred for multiparameteric prostate MRI. (A) An axial T2-weighted image shows a large mass-like area of homogenous decreased T2 signal intensity with the far anterior transition zone of the prostate gland (showed by the white arrows between), with measurable extension of this tissue anteriorly to the anterior fibromuscular stroma of the prostate (white arrows).Results is almost certain to be located in the transition zone tumour with anterior extracapsular extension. (B) Axial apparent diffusion coefficient maps show a corresponding area of low apparent co-efficient value (indicated with the white arrows). (C) A subtracted axial image from early dynamic contrast – enhanced acquisition showed corresponding early enhancement (indicated with the white arrows). (D) A colourized perfusion map created from the dynamic contrast –enhanced MRI acquisition using post processing software shows abnormal perfusion. Biopsy of this lesion confirmed the presence a Gleason 7 (3 + 4) tumour in the location.

2A), low value on the apparent co-efficient map suggest an area of restricted diffusivity (Figure 2B), early enhancement of the prostate on dynamic contrast-enhanced suggest a possible lesion (Figure 2C) and an abnormal perfusion on the dynamic contrast enhanced MRI also suggest a lesion (Figure 2D). Subsequent targeted biopsy of this lesion confirmed the presence of a Gleason 3+4=7 tumor in this location. The multiparameteric MRI (mpMRI) helped to identify tumor (lesion) and those of the extracapsular extension which were not detected when the trans-ultrasound guided rectal examination.

In the month of July 2016, patient had a whole body CT that showed a 2.2 cm mass in the tail of the pancreas. Laboratory blood investigation revealed an elevated level of 67 U/mL of CA19-9 tumor biomarker in blood suggestive of a possible pancreatic cancer. Patient had CT-guided lesion biopsy of the pancreas for immunohistochemical analyses of the pancreas.

Immunohistochemistry profile showed a positive Villin, CA19-9 and CEA, and negative response on Prostatic acid phosphate and Prostate Specific antigen. Based on these findings suggest a possible pancreatic cancer due to positive response for CA19-9; positive response on Villin and CEA are also known to be associated with some cancers such colon cancer, other diagnostic investigations are recommended for confirmation of tumor origin to help with treatment plan; negative finding on Prostatic acid phosphate and PSA suggest no evidence of prostate pathology, but further investigation can be carried out for subsequent diagnosis into this patient condition.

In September 2016, patient was taken for operative exploration and underwent a splenectomy, distal pancreatectomy and lymphadenectomy. Pathological analysis reveals a 2.8 cm × 2.4 cm × 2.1 cm moderately differentiated adenocarcinoma, the presence of peri-pancreatic fat invasion, perineural invasion and absence of vascular invasion. Surgical resection of 1.7 cm from the proximal pancreatic margin was positive with 1/13 regional lymph node harboured malignant disease. Based on this information the patient was diagnosis of pancreatic cancer and in accordance to The American Joint Committee of Cancer (AJCC) 7th edition cancer staging manual, patients cancer can be described as limited to the pancreas and is more than 2 cm in greatest dimension (pT2), there is regional lymph node metastasis (N1) with no distant metastasis (M0) and then grouped as Stage II B. Figure 3 show a schematic presentation of stage II B pancreatic cancer.

Discussion

Prostate Cancer is commonly diagnosed when patient presents with clinical symptoms relating to metastatic spread to bone or

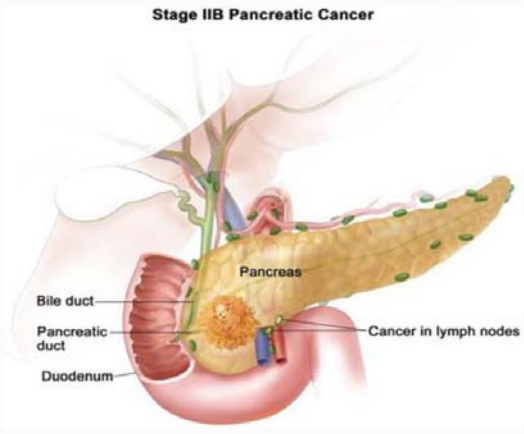

Figure 3: Schematic representation of Stage II B pancreatic Cancer. Shows Stage II B pancreatic cancer which has spread to nearby lymph nodes but not spread to distant organs [9].

Table 1: Summary of patient family history.

Family Member	Age	Cancer Present (Yes or No)	Type (s) of cancer(s) (If yes)	Dead/Alive
Patient Father	64	No		Alive
Patient Mother	52	Yes	Breast and Ovarian Cancer	Dead
Patient Brother	39	No		Alive
Patient sister	43	Yes	Triple Negative Breast cancer	Alive
Maternal grandmother	62	Yes	Triple Negative Breast cancer	Dead
Maternal grandfather	90	No		Alive
Paternal grandfather	79	No		Dead
Paternal grandmother	85	No		Alive

during a routine Prostate Specific Antigen test (PSA). Inaccurate diagnosis of prostate cancers, based on serum protease level secreted and inadequate treatment for metastasis necessitate identification of improved diagnostics for screening methods and new therapeutic targets [10]. Harvey et al. [11] reported that transrectal ultrasound is an imaging modality of choice for prostate, despite its high frequency wide band probes; grey scale ultrasound has an accuracy of only 50% to 60% for prostate cancer detection and a relatively poor staging for extracapsular extension. Other studies has shown that digital rectal examination help detect tumor in the lateral and posterior aspect of the prostate; limitation to digital examination is that about 85% of cancers arises peripherally where they can be detected with the finger examination [12]. Prostate cancer can be diagnosed through a routine PSA testing, digital rectal examination and transrectal ultrasound guided biopsy with Gleason score to confirm biopsy in the patient. In our case showed a negative diagnostic response on the transrectal ultrasound and digital rectal examination may be due to the location of the tumor (anterior extracapsular extension) but detected with the multiparameteric MRI. Humphrey [13] reported in a study that a common practice has been to translate Gleason score of 2 to 4 as well differentiated, Gleason score of 5 to 7 as moderately differentiated and Gleason 8 to 10 as poorly differentiated. Gleason score of 7 can be categorized as either 3+4 or 4+3, Gleason 7 with 3 dominating (3+4) has a very good prognosis compared to Gleason 7 with 4 dominating (4+3) [13]. In our case, patient had a Gleason score of 7 category from 3+4 scores with 3 dominating suggest tumor still have some good prognosis. Gleason scores consistently are associated with the risk of lymph node diseases [14,15]. Traditionally, prostate cancer with a Gleason Score 2 through 4, the risk of lymph node spread will be 0% to 20%; for Gleason scores 5 through 7, the risk is 31% to 38%, and, for Gleason score 8 through 10, the risk is from 62% to 93% [13]. Swanson [16], reported that Gleason score of 7 have a risk of lymph node metastasis >20%. In our case possible dissection of patient lymph node may provide important prognostic information and effective treatment planning. Further diagnostic test can also help to determine and direct therapy for patient. Kogianni et al. [10] reported a study that confirm Endo180 in determining prostate cancer progression in some patient with Gleason 7 (3+4) and 7 (4+3), can help with therapy plan. Similar studies by Rodriguez et al. [17] reported Endo180 as a prognostic marker and a therapeutic target have a significant impact on the prognosis and prevention of metastasis of prostate cancer. Although we are not performing neo-adjuvant or adjuvant therapy in this patient, but we recommend active surveillance with careful laboratory investigation for expression of Endo180 to assess for prostate cancer progression and observation with MRI, CT, or PET/CT, as PSA does not always accurately represent cancer prognosis [18].

It is very essential to confirm the origin of pancreatic tumor whether is a primary or secondary origin for effective treatment plan. However, it is difficult to differentiate a primary and secondary metastatic tumor, when given very low incidence of pancreatic metastasis. Patient had further diagnostic imaging and tumor biomarkers investigation after a period of time which suggests pancreatic cancer. In this patients immunohistochemical profile showed a positive response to Villin and CEA which are known to be biomarkers to help assess treatment response in cancers like colorectal cancer, this findings makes it difficult to fully confirm the origin of the pancreatic cancer as metastatic in origin or not. Currently, Carbohydrate antigen 19.9 may quantify best for this purpose due to the secretion in about 75% to 80% of pancreatic cancer patient [7]. However, it is unclear whether extraordinarily increased in CA19.9 indicates otherwise undetected disseminated diseases which needs profound diagnostic work [19]. In other study has proven Carcinoembryonic Antigen (CEA) as a potential marker of pancreatic cancer [20]. Further studies have shown a link between pancreatic metastasis and CEA. Carcinoembryonic antigen is expressed on the surface of cells and roles of cellular linkage [21]. Hence, malignant cells may be characterized as aggravate and metastasize with increased CEA expression. In our case may indicate a possible metastasis. To confirm the origin of tumor in this patient, pathological and immunohistochemical examination of endoscopic ultrasound guided fine needle aspiration biopsy of the pancreatic tumor will be helpful to confirm the tumor origin. The patient had a remarkable family history. Breast cancer and ovarian cancer were diagnosed in his deceased mother at the age of 52. Triple negative breast cancer was diagnosed in his 43 years old sister who is still alive and his deceased maternal grandmother at the age 62. Also, another study has shown that there is a relationship between mutation of the BRCA2 gene and the incidence of pancreatic cancer as well as breast cancer [22]; other studies suggest that a significant portion of the increased risk of pancreatic cancer in individuals of Ashkenazi Jewish descent has a genetic basis from DNA defect (617deiT) mutation passed from generation to generation [23]. As a result 1% of all living Ashkenazi Jewish descent now inherit a defective copy of one of their BRCA2 gene [24]. In our case, one could speculate that there could have been common BRCA2 mutation between patient and his mother who had died of breast cancer and ovarian cancer. The prognosis of pancreatic cancer is with a 5-year survival rate of only 6% [25]. Treating pancreatic cancer is potentially effective with surgery but relatively resistant to medical treatment. Pancreatic cancer is staged immediately when it is been diagnosed into stages with stage I as the earliest and stage IV as evidence disease characterized with metastasis.

Pancreatic cancer patient can be categorized into three classes

namely, Class I (Patient with local disease which is equivalent to stage I or II) Class II (Patient with locally advanced unresectable disease equivalent to stage III) and Class III (Patient with metastatic diseases which is also equivalent to stage IV). In our patients case there is no evidence of distant metastasis according to the cancer staging (stage IIB), but there are available form of treatment, although the chance of curing the disease is minimal. Patient treatment plan include low dose of combined chemotherapy and radiotherapy all aimed to decrease the possibility of metastasis to surrounding tissue thereby to prevent any pancreatic cancer related symptoms. Example of combined dose of chemotherapy includes Folinic acid, Fluorouracil, iriniotecan and oxaliplatin (FOLFIRINOX). And follow up to ensure response to treatment.

Conclusion

Active surveillance was the option for the prostate cancer in this patients case which includes, laboratory investigation for the expression of Endo180 to assess for prostate cancer progression, radiological examination with MRI, CT and additional routine close monitoring of patient PSA level (every 3 to 6 months), prostate biopsy within 6 to 12 months, digital rectal examination at least once every year etc. Patient will receive treatment when result obtained during the active surveillance showed that cancer is more aggressive with other clinical manifestation into patient condition e.g. urinary tract blockade, pain etc. We suspected patient with a pancreatic cancer with no evidence of distant metastasis, we then recommended low dose of combined chemotherapy and radiotherapy so as to enhance patient quality of life. Follow up will be ensured in every 6 months to help assess patient response to management and therapy methods in both conditions.

Statement of Ethic

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images.

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