# Diagnosis of Pancreatic Adenocarcinoma in a Case of 25-year-old Female from Nepal

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## ABSTRACT

Pancreatic adenocarcinoma is one of the lethal form of malignant change involving the pancreas. The median age of diagnosis is 71 years and is uncommon below 40 years. Here we intend to report an uncommon case of a 25-year-old woman who presented to our institution with complaints of fever, severe abdominal pain. The laboratory workup showed bicytopenia with USG abdomen revealing a bulky pancreas. The Contrast Enhanced Computed Tomography and Magnetic Resonance Cholangiopancreatography suggested malignancy followed by Fine Needle Aspiration Cytology (FNAC) which confirmed the diagnosis of adenocarcinoma. Pancreatic adenocarcinoma is the 14th most common cancer and 7th most common cause of cancer death. Computed tomography is most useful modality of investigation used to diagnose and stage the cancer. This is supported by FNAC and CA19-9 tumor marker. The management includes surgical resection and chemotherapy. Although pancreatic adenocarcinoma is uncommon among the young population, it requires early management protocols.

## KEY WORDS

*CA 19-9 antigen, Case report, Nepal, Pancreatic cancer, Risk factors*

## INTRODUCTION

Pancreatic adenocarcinoma is one of the lethal form of malignant change involving the pancreas comprising approximately 90% of all solid tumors of the pancreas.[1] It is mostly diagnosed at an advanced stage and is thus resistant to all modalities of therapy. The median age at diagnosis is 71 years and is rarely ever diagnosed below the age of 40.[2] Smoking, long-standing diabetes mellitus, chronic pancreatitis, obesity, non-O blood group along with genes and genetic syndromes are common risk factors associated with pancreatic cancer.[2,3] The defining features of the disease includes: a very high rate of activating mutations in KRAS, progression from distinct types of precursor lesions, a propensity for local and distant metastasis, an extensive stromal reaction resulting in a hypoxic microenvironment, reprogramming of cellular metabolism, and evasion of tumor immunity.[2]

We have presented the case report in accordance with 2020 SCARE Guidelines.[3]

## CASE REPORT

A 25-year old married woman belonging to the Tamang ethnicity of Nepal presented to the outpatient department of our hospital with complaints of fever, severe abdominal pain and vomiting for 5 days. She gave a past history of low grade fever 2-3 weeks back with on and off abdominal pain. The patient did not mention any history of anorexia, jaundice and weight loss. She indicated she had never smoked or drank any alcoholic beverages in her life. There was no past history of chronic illnesses or a family history of any gastrointestinal diseases or malignancy. She did not have a significant surgical and medication history.

Physical examination revealed pallor and her vitals showed tachycardia with a pulse rate of 120 beats per minute. Her baseline temperature was recorded as 100 degrees Fahrenheit. However, her blood pressure was stable at the time of presentation. On systemic examination, particularly the abdominal examination, it revealed the abdomen to be slightly distended and mild tenderness over the epigastrium

**Table 1.** SCARE Checklist

| Topic | Item | Checklist item description |
|---|---|---|
| **Title** | 1 | The words “case report” and the area of focus should appear in the title (e.g. presentation, diagnosis, surgical technique or device or out-come). |
| **Key Words** | 2 | 3 to 6 key words that identify areas covered in this case report (include "case report" as one of the keywords). |
| **Abstract** | 3a | Introduction-What is unique or educational about the case? What does it add to the surgical literature? Why is this important? |
| | 3b | The patient's main concerns and important clinical findings. |
| | 3c | The main diagnoses, therapeutics interventions, and outcomes. |
| | 3d | Conclusion — what are the “take-away” lessons from this case? |
| **Introduction** | 4 | A summary of why this case is unique or educational with reference to the relevant surgical literature and current standard of care (with references, 1-2 paragraphs). Nature of the institution in which the patient was managed; aca-demic, community or private practice setting? |
| **Patient Information** | 5a | De-identified demographic and other patient specific information including age, sex, ethnicity, occupation and other useful pertinent information e.g. BMI and hand dominance. |
| | 5b | Presentation including presenting complaint and symptoms of the patient as well as the mode of presentation e.g. brought in by ambulance or walked into Emergency room or referred by family physician. |
| | 5c | Past medical and surgical history and relevant outcomes from interventions |
| | 5d | Drug history, family history including any relevant genetic information, and psychosocial history including smoking status and where relevant accommodation type, walking aids, etc. |
| **Clinical Findings** | 6 | Describe the relevant physical examination and other significant clinical findings (include clinical photographs where relevant and where consent has been given). |
| **Timeline** | 7 | Inclusion of data which allows readers to establish the sequence and order of events in the patient's history and presentation (using a table or figure if this helps). Delay from presentation to intervention should be reported. |
| **Diagnostic Assessment** | 8a | Diagnostic methods (physical exam, laboratory testing, radiological imaging, histopathology etc). |
| | 8b | Diagnostic challenges (access, financial, cultural). |
| | 8c | Diagnostic reasoning including other diagnoses considered |
| | 8d | Prognostic characteristics when applicable (e.g. tumour staging). Include relevant radiological or histopathological images in this section (the latter may sometimes be better placed in section 9). |
| **Therapeutic Intervention** | 9a | Pre-intervention considerations e.g. Patient optimisation: measures taken prior to surgery or other intervention e.g. treating hypother-mia/hypovolaemia/hypotension in a burns patient, ICU care for sepsis, dealing with anticoagulation/other medica-tions, etc |
| | 9b | Types of intervention(s) deployed and reasoning behind treatment offered (pharmacologic, surgical, physiotherapy, psychologi-cal, preven-tive) and concurrent treatments (antibiotics, analgesia, anti-emetics, nil by mouth, VTE prophylaxis, etc). Medical devices should have manu-facturer and model specifically mentioned. |
| | 9c | Peri-intervention considerations - administration of intervention (what, where, when and how was it done, including for surgery; anaesthesia, patient position, use of tourniquet and other relevant equipment, prep used, sutures, devices, surgical stage (1 or 2 stage, etc). Pharmacolog-ical therapies should include formulation, dosage, strength, route, duration, etc). |
| | 9d | Who performed the procedure - operator experience (position on the learning curve for the technique if established, specialisa-tion and prior relevant training). |
| | 9e | Any changes in the interventions with rationale. Include intra-operative photographs and/or video or relevant histopathology in this section. Degree of novelty for a surgical technique/device should be mentioned e.g. "first in-human". |
| | 9f | Post-intervention considerations e.g. post-operative instructions and place of care. |
| **Follow-up and Outcomes** | 10a | Clinician assessed and patient-reported outcomes (when appropriate) should be stated with inclusion of the time periods at which assessed. Relevant photographs/radiological images should provided e.g. 12 month follow-up. |
| | 10b | Important follow-up measures - diagnostic and other test results. Future surveillance requirements - e.g. imaging surveillance of endovascular aneurysm repair (EVAR) or clinical exam/ultrasound of regional lymph nodes for skin cancer. |
| | 10c | Where relevant - intervention adherence and tolerability (how was this assessed). |
| | 10d | Complications and adverse or unanticipated events. Described in detail and ideally categorised in accordance with the Clavien-Dindo Classi-fication. How they were prevented, diagnosed and managed. Blood loss, operative time, wound complications, re-exploration/revision sur-gery, 30-day post-op and long-term morbidity/mortality may need to be specified. |
| **Discussion** | 11a | Strengths, weaknesses and limitations in your approach to this case. For new techniques or implants - contraindications and alternatives, potential risks and possible complications if applied to a larger population. If relevant, has the case been reported to the relevant national agency or pharmaceutical company (e.g. an adverse reaction to a device). |
| | 11b | Discussion of the relevant literature, implications for clinical practice guidelines and any relevant hypothesis generation. |
| | 11c | The rationale for your conclusions. |
| | 11d | The primary “take-away” lessons from this case report. |
| **Patient Perspective** | 12 | When appropriate the patient should share their perspective on the treatments they received. |
| **Informed Consent** | 13 | Did the patient give informed consent for publication? Please provide if requested by the journal/editor. If not given by the patient, explain why e.g. death of patient and consent provided by next of kin or if patient/family untraceable then document efforts to trace them and who within the hospital is acting as a guarantor of the case report. |
| **Additional Information** | 14 | Conflicts of Interest, sources of funding, institutional review board or ethical committee approval where required. |

was elicited. The laboratory studies revealed bicytopenia with hemoglobin of 8.6 g/dl and total leukocyte count of 3000 cells/microliter. The platelet count was 279000 cells/microliter. She was thus admitted with an initial diagnosis of sepsis and treated accordingly. Further investigations revealed normal LFT and RFT values.

An abdominal ultrasound revealed a bulky pancreas with poorly defined heterogeneously hypoechoic areas and retroperitoneal lymph node involvement as shown in figure 1.

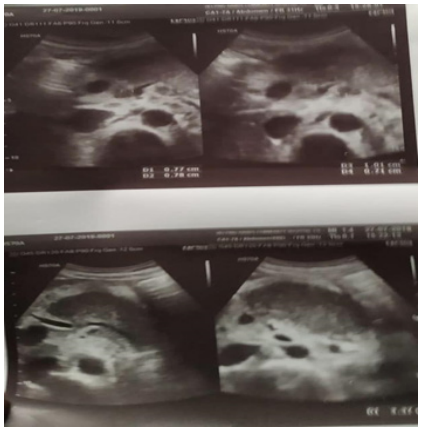

**Figure 1. Showing a bulky pancreas with poorly defined heterogeneously hypoechoic areas on the body of the pancreas with retroperitoneal involvement.**

Similarly, a follow up Contrast Enhanced Computed Tomography (CECT) abdomen revealed a heterogeneous pancreatic mass arising from the pancreatic head measuring 48*75*59 mm (Fig. 2) along with a dilated main pancreatic duct traversing through this lesion. The lesion was seen encasing the celiac artery with the mass also indenting the lesser curvature of the stomach and pushing it anteriorly. Multiple enlarged lymph nodes with the largest being 16.9*8.8 mm seen in the peripancreatic region. These findings were suggestive of a primary pancreatic neoplasm with local invasion and retroperitoneal lymph node involvement. This was further supported on performing MRCP which revealed local invasion of the surrounding tissues with encasement of the multiple arteries and nodal metastasis.

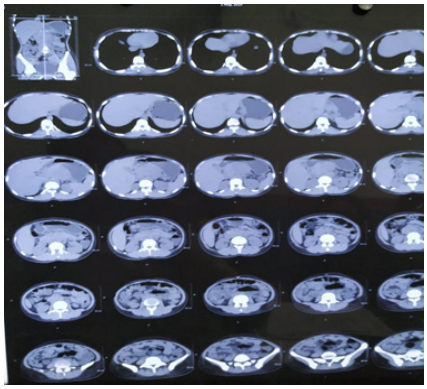

**Figure 2. Showing a heterogeneous pancreatic mass measuring 48*75*59 mm with local tissue invasion along with involvement of the regional peripancreatic lymph nodes.**

## DISCUSSION

Pancreatic cancer is ranked as the 14th most common cancer and the 7th highest cause of cancer mortality in the world.[4] It often presents at an advanced stage, which contributes to the poor five-year survival rates of 2-9%, ranking firmly it as the last amongst all cancer sites in terms of prognostic outcomes for patients.[4] The incidence of pancreatic adenocarcinoma is around the seventies and the occurrence of disease below the age of 40 is uncommon.[2] Among the cases of pancreatic carcinoma, the early-onset pancreatic cancer (EOPC) is defined as the age at onset < 50 years to 55 years which accounts for 5-12% of all pancreatic carcinoma diagnosed and its incidence has been rising according to modern reports.[5] The patient in our study was incidentally diagnosed and worked up subsequently at a very young age of 25 years. Along with the fact she is of female gender, it makes this case very uncommon among the medical literature.

Cigarette smoking is considered the most important modifiable risk factor in pancreatic cancer with multiple individual and combined studies demonstrating a strongly positive association.[6] Alcohol, chronic pancreatitis, obesity, diet along with non-modifiable factors like increasing age, male sex, Caucasian ethnicity and genetic factors have also been linked strongly to the disease. Among many, BRCA2 and PALB are the most commonly implicated mutations.[4]

The presenting symptoms of this disease can include weight loss, anorexia, jaundice, floating stools, pain, dyspepsia, nausea, and depression.[6,7] These clinical manifestations can be initially vague causing a diagnostic uncertainty.[8]

CT is the most widely available and best-validated imaging modality for diagnosing patients with pancreatic cancer.[4,9] In addition to diagnostic value, it is also used as the primary modality for staging pancreatic cancer. Laparoscopy is another potentially valuable diagnostic tool for staging.[4]

A histologic diagnosis of adenocarcinoma of the pancreas is often made using fine-needle aspiration (FNA) biopsy with either EUS-guidance or CT. EUS-directed FNA biopsy is preferable to CT-guided FNA because of the much lower risk for peritoneal seeding with EUS-FNA compared with the percutaneous approach.[4,6]

Many tumor-associated antigens have been studied in connection with pancreatic adenocarcinoma, among which, Serum cancer antigen 19-9 (CA 19-9) is the only marker approved by the United States Food and Drug Administration for use in the routine management of pancreatic cancer as of now.[4,9] However, the level of CA 19-9 level in our case was not significantly raised despite several other investigations hinting towards pancreatic adenocarcinoma.

Surgical resection is the only treatment that offers a potential cure of pancreatic cancer and the addition of chemotherapy in the adjuvant setting has been shown

to improve survival rates.[4] Pancreatico-duodenectomy (Whipple's procedure), distal or total pancreatectomy are the surgical options for the resection of pancreatic cancer depending on the anatomical location of the tumor or tumors. For chemotherapy, mFOLFIRONOX (a combination of oxaliplatin, irinotecan, and leucovorin) is used for very fit patients with tumors of the head, body and tail of the pancreas whereas in a less fit patient dual therapy with gemcitabine and capecitabine is given.[4,10,11]

Despite developments in detection and management of pancreatic cancer, only about 4% of patients will live 5 years after diagnosis. Unfortunately, 80-85% of patients present with advanced inoperable disease.[8,12] Hence, palliative therapy remains a substantial requirement owing to the prevalence of advanced disease in a significant majority of diagnosed patients. It should address pain control, biliary and gastric outlet obstruction, malnutrition, thromboembolic disease, and depression.[6,12]

Pancreatic adenocarcinoma is one of the cause of cancer death among the elderly population due to its late presentation and potential malignant tissue invasion. It is very uncommon in the young population and among the female gender. A CT scan is the gold standard to establish a diagnosis which can be further supported by doing a MRCP, EUS guided FNAC and checking the level of CA 19-9. The management depends upon the stage of cancer and prognosis. The initial management typically included surgery and induction of chemotherapy. However, for advanced disease or those with poor prognosis, palliative management can be undertaken. We would like to provide an additional emphasis on the fact that such cases of pancreatic adenocarcinoma can occur among young population despite there being few medical literatures to support this.

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