

# Role of Radiology in Pica Syndrome: A Case Report

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## Case Report

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# Abstract

**Background:** Pica syndrome is a mental disorder defined as eating non-food and not-nutritive substances at least for 1 month. The diagnosis of pica syndrome is based on severe anemia which is not compatible with the developmental level, intestinal obstructions, or several conditions depending on content of the substance intaken such as lead poisoning etc. The diagnosis of pica syndrome requires active involvement of pediatrics, psychiatrists, radiologists and patients/family members.

**Case Presentation:** In this report, we present a 50-year-old female patient who presented to the emergency department with abdominal pain and radiologically diagnosed with pica syndrome. Patient's physical and laboratory investigations were normal, while all abdominal tomography revealed hyper-density areas. It was found in the detailed history of the patient that she was receiving psychiatric therapy and had habit of eating cigarette ashes. Upon this, cigarette ashes soaked in water were radiologically examined, similar hyper-density areas were found, and the diagnosis of pica syndrome was established.

**Conclusion:** This case is the third case of eating cigarette ashes pica presented in the literature, and the first case diagnosed radiologically.

## Introduction

Pica syndrome is defined as eating non-nutritive and non-food substances in a developmentally and culturally inappropriate way at least for 1 month [1]. Pica syndrome is commonly seen in children and pregnant women, although it can be developed in each age, gender, and population [2].

Current knowledge suggests that pica is a multicausal disorder. The most commonly adopted theories for the mechanism of pica are malnutrition and psychosocial factors [3]. Several factors are involved in the mechanism of Pica behaviour ranging from demands from the tradition and acquired cultural tastes to presumptive neurobiological mechanisms such as physiological conditioning, iron deficiency, CNS neurotransmission [4]. In addition, mental disorders such as obsessive-compulsive disorder or schizophrenia have also been associated with pica. Certain psychosocial stressors such as joint family, disorganized family structure, maternal deprivation, parental neglect and impoverished parent-child interaction have been linked to pica [5]. There are studies in the literature linking pica to stress, depression, and anxiety [3, 6].

The incidence of pica syndrome is not exactly known. The diagnosis of pica syndrome is based on severe anemia which is not compatible with the developmental level, intestinal obstructions, or several conditions depending on content of the substance intaken such as lead poisoning etc [7]. The diagnosis of pica syndrome requires active involvement of pediatrics, psychiatrists, radiologists and patients/family members. Radiographic examination plays an important role in the diagnosis of pica. In this report, a patient who presented to the emergency department with abdominal pain and who was found to eat

cigarette ashes with radiologic examination was presented. This case is the third case of eating cigarette ashes pica presented in the literature, and the first case diagnosed radiologically.

## Case Presentation

A 50-year-old female patient presented to the emergency department of our hospital with the complaint of abdominal pain. In the physical examination, patient was pale and had nausea and vomiting. Otherwise the examination was unremarkable. Respiratory rate, heart rate, blood pressure and oxygen saturation of the patient were normal. Biochemical blood and urine analysis parameters were within the normal range. In the laboratory analysis; creatinine was found as 0.81 mg/dL, ALT 15.3 U/L, AST 12.9 U/L, urea 26 mg/dL, WBC 8.56 and RBC 4.51.

It was learned from history of the patient that she was using psychiatric drugs and receiving depression therapy. Upon abdominal pain of the patient was not relieved with hydration, all abdominal unenhanced tomography was ordered. Computed tomography performed as IV oral unenhanced revealed patchy radiopaque hyper-density areas in the stomach and small intestine with a density of 307.23 HU (Figure 1).

Thereupon, the patient was questioned about whether she underwent contrast enhanced examination within the last few day and it was learned that that patient was not administered any investigation.

In order to investigate the source of hyper-density areas in the stomach and loops, clinical questioning was deepened and it was learned that the patient was receiving not only antidepressants, but also antipsychotic drugs. Upon the psychiatric problem of the patient that was understood; considering that pica syndrome may be seen in these patients, and a probability of eating some abnormal things was taken into account. Hereon the anamnesis was deepened, and the patient reported that she was eating ashes of 2-3 cigarettes a day for a while, but she ate ashes of about 10 cigarettes on the day she arrived to the hospital, and presented to the emergency department due to abdominal pain.

Some dry cigarette ashes were collected and radiologically examined because of the hyper-density areas seen on the abdominal tomography. However, no bright white areas were observed on the CT image as in our patient. It was thought that this might be caused by mixing of the ashes with sputum and gastric secretions, and some ashes were soaked in water. On the CT taken, a hyper-density area was observed similar to the tomography image of the patient with a density of 320 HU (Figure 2).

The patient was diagnosed with pica syndrome. The small amount of radiopacity in the dry ashes were thought to gain density when soaked in water. The dry ashes were soaked in water to reflect the gastric content.

The patient whose abdominal pain was relieved with serum, was advised for psychiatric consultation. However, the patients stated that she was already receiving psychiatric therapy, rejected the consultation, and discharged.

## **Discussion**

Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria defined pica syndrome as eating non-nutritive and non-food substances at least for 1 month. Our patient was a 50-year-old women without pregnancy. Pica syndrome has also been reported with mental retardation, schizophrenia and autistic disorder [8]. In addition, this syndrome is seen in individuals with normal intelligence, and diagnosed with obsessive-compulsive disorder, pathologic anxiety, schizophrenia, emotional disorder, and depression [9]. Our patient was receiving depression therapy and using antipsychotic drugs.

Pica may lead to infections and parasitic infestation. Pica may be prolonged in persons with mental disorders. Physicians sometimes have difficulty in receiving history from pica patients. These problems are mostly resulted from the patient. The diagnosis is often established in the presence of anemia, lead poisoning, intestinal obstructions and other medical conditions. Pica diagnosis usually requires admit of the patient, because clinical findings are non-specific. In our patient also there was no pica behaviour in the first received history. However, upon the source of hyper-density areas in the abdomen could not be understood, anamnesis was deepened and the patient admitted her pica behaviour in form of eating cigarette ashes.

Although various pica syndrome case have been reported in the literature, to our knowledge only two cigarette ashes pica cases were published. First was a 33-year-old Puerto Rican woman described by DeSilva in 1975 [10]. The second case was a 55-year-old woman with chronic renal failure who was described by Aoyagi et al. from Japan in 2000 [11]. However, unlike these cases cigarette ashes pica was diagnosed in our patient with radiology for the first time in the literature.

In our patient, computed tomography images were found suspected, it was thought that the patient might ate a non-food thing, and it was decided to deepen her history. In the history taken for a second time, the patient was stated that she was receiving antipsychotic drugs in addition to antidepressants. Considering psychologic status and suspected attitude of the patient, a new anamnesis was received with the suspicion of pica syndrome. Upon information given by the patient, cigarette ashes collected in the outer environment was prepared and radiologically examined, and opacities similar with abdominal tomography images of the patient were obtained. Thus, definitive diagnosis of pica syndrome was established.

## **Conclusion**

In case of opacities on abdominal tomography of patients especially those receiving psychiatric therapy, in the absence of other clinical findings these patients should be questioned for pica syndrome. For this purpose, history of patients should be carefully received and radiologic evaluation should be performed in a multi-directional way.

## **Declarations**

**Ethical Approval and Consent to Participate:** N/A

**Consent for Publication:** Informed consent form was obtained from the patient for this case report.

**Availability of data and materials:** N/A

**Competing Interests:** the authors declare no competing interests to disclose.

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**Ethics Considerations:** Informed consent form was obtained from the patient for this case report tu use patient information for publication purpose.

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## Figures



**Figure 1**

Unenhanced abdominal tomography images of the patient



**Figure 2**

Radiologic image of cigarette ashes soaked in water