

## A MAN WHO DRANK CEMENT WAS TREATED BY WHOLE BOWEL IRRIGATION

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### **Abstract**

Direct toxicity of cement is most often observed in cement industrial workers; however, oral cement use for suicide is rare. In our case, a 45-year-old male patient drank a mixture of cement and water in order to suicide. We aimed to eliminate toxins from the body as soon as possible and serum saline and polyethylene glycol-electrolyte solution (PEG-ELS) was given with nasogastric catheter to stomach for whole bowel irrigation. Owing to acceleration of stomach and intestinal movements, within one or two hours, he developed a diarrhea-like situation and rectal discharge of the substance through rapid cathartic effect. In this article, we showed that whole bowel irrigation should be considered among treatment options as we applied it on a patient who took cement orally.

**Keywords:** Cement, emergency, intoxication, treatment, whole bowel irrigation

### **Introduction**

The production of cement is increasing around the world due to rapid urbanization. During cement production, especially factory workers could be directly or indirectly affected. Cement can be directly taken into the body with inhalation, gastrointestinal system, or skin. In addition cement could also cause water, food, and air pollution through the waste disposed in surrounding areas<sup>(1)</sup>. Its content of CaO, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, Pb, Ni, Cu, a small amount of MgO, and some other chemicals might lead to severe toxicities<sup>(1,2)</sup>.

Direct toxicity of cement is most often observed in cement industrial workers. Severe acute toxicities and death have been reported in the literature as a result of accidental exposure to the heavy metals and some chemicals in the cement<sup>(3)</sup>. Besides, oral cement use for suicide is also observed, though rare<sup>(4)</sup>.

Although it is known that whole bowel irrigation is performed to treat heavy metal intoxications, there has been no report in the literature on the use of this method following oral cement intake. In this article, we showed that whole bowel irrigation should be considered among treatment options as we applied it on a patient who took cement orally on a suicide attempt and obtained efficient and quick results.

## Case report

A 45-year-old male patient, who drank a mixture of cement and water in order to suicide, was transferred to our emergency department within the first one hour. We learned his history that he was a construction worker, had serious socioeconomic troubles and, he had been treated for major depression in the past. On arrival in the emergency department, his blood pressure was 140/85 mmHg, and his heart rate was 88 beats per minute.

He had pain on deep palpation of the epigastric area in the abdomen; however, no rebound and defense were detected and his intestinal movements were within the normal range. The chest x-ray, abdomen x-ray, and abdominal tomography of the patient revealed a radioopaque view of cement in the stomach and intestines (Figure 1 and 2). Radiological examinations showed no findings of organ perforation and other anomalies. Laboratory examinations were within normal limits.

A nasogastric catheter was inserted and serum saline and polyethylene glycol-electrolyte solution (PEG-ELS) was given in the patient's stomach for whole bowel irrigation, but gastric lavage was not done. Intravenous liquid infusion, pump inhibitor as stomach protector, and prophylactic antibiotics were also administered to the patient. He was investigated by upper gastrointestinal endoscopy and any pathology was not detected.

Diarrhea was developed in the patients on the first day. Follow-up, repeated abdomen x-ray revealed that the opaque material representing cement had descended to the level of lower intestines and no finding of perforation was observed. The patient was referred to psychiatric consultation, repeated laboratory findings were found normal and he was discharged with advises.

He was called for follow-up examination one week later and it was observed that the results of both his physical examination, radiological and laboratory findings were within normal limits.

## Discussion

During cement production, workers of cement industry are directly and local people are indirectly affected. High temperature, dust, allergic materials, noise and certain chemicals as a result of cement production directly threaten the workers, while the surrounding environment and the local people are threatened by water, air, and soil pollution caused by waste gases, toxic chemicals, and heavy metals in chimney emissions<sup>(1,2)</sup>.

Cement has heavy metals such as manganese, arsenic, cadmium, selenium, zinc, nickel, chromium, copper, mercury, lead, and vanadium in its content<sup>(1,2)</sup>. Taken into human body, these metals lead to short- or long-term serious problems, such as, arsenic may cause anemia, liver and kidney dysfunction, lung and respiratory problems<sup>(5)</sup>. Mercury might lead to behavioral changes, memory problems, and loss of muscle coordination by accumulating in the brain and kidneys and affecting neural system. The more common clinical presentations relate to the accidental indirect acute toxicity of cement or chronic intoxication findings among cement factory workers.

In a study by Berend K et al., while renewing the pipes for dialysis liquids, they were lined on the inside with a cement mortar and later, the patients dialyzed with these dialyzers developed acute aluminum encephalopathy<sup>(3)</sup>. 10 among 27 patients exposed to the contaminated dialyzed liquid died. The serum aluminum levels of these patients had been considerably high<sup>(3)</sup>. In two cases reported by Kvistad PH et al., ethylene chlorohydrin acute intoxication developed following the swallowing of film cement<sup>(6)</sup>.

Fujino Y et al. reported on the clinical status of a 54-year-old patient who took cement (180 mL of rapid-hardening cement) with suicidal intent<sup>(4)</sup>. Milk, sodium alginate, a proton pump inhibitor and antibiotics were administered to the patient. Patient's endoscopy revealed erosive lesions in the esophagus and stomach. Later, an acute renal failure with persistent

oliguria was developed in the patient. The serum level of silicon was found 25.1 microg/mL and the patient was then taken to dialysis. After dialysis, serum level of silicon was found 9.2 microg/mL. The authors recommended a serum silicon level of less than 10 microg/mL to avoid renal dysfunction<sup>(4)</sup>.

Our patient drank a mixture of cement and water on a suicide attempt. In his x-ray and tomography, cement was viewed as radiopaque material in the stomach and intestines. The treatment aimed to eliminate toxins from the body as soon as possible. Therefore, to accelerate stomach evacuation and to increase intestinal movements in the patient, nasogastric was inserted and liquid and PEG-ELS were administered. Within one or two hours, he developed a diarrhea-like situation and rectal discharge of the substance through rapid cathartic effect, which went on for approximately 12 hours. Because of rapid empty of bowel, intra-stomach administration of liquid and polyethylene glycol-electrolyte solution was ended earlier.

During admission, the patient exhibited no finding of pathological examination except for an increase in intestinal movements and diarrhea. The results of his laboratory tests after discharge were also normal. The lack of any severe toxicity finding in the patient in acute and chronic period was attributed to his very early presentation to the emergency clinic and acceleration of toxin discharge.

Bowel irrigation is a method used to clean the intestines before surgical operation, has also been used to eliminate toxin in intoxicated patients for three decades. It is usually indicated in intoxications with heavy metals, body packages, iron, lithium, and continuous or delayed release drugs<sup>(7,8,9)</sup>. This technique is particularly effective in intoxications such as heavy metals that cannot be absorbed by active carbon, and in which other gastrointestinal decontamination options cannot be used. However, it should be avoided in these cases; the patients whose general situation and hemodynamics findings are worse, they have severe problems related to the gastrointestinal system, they have not any respiratory tract protective reflexes and their intestinal sounds are not auscultated<sup>(9)</sup>.

Consequently, the lack of any severe toxicity findings in our case during the acute period can be attributed to his very early presentation to the emergency department and acceleration of toxin discharge. In appropriate patients, whole bowel irrigation should be considered for gastrointestinal decontamination.

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**Figure 1.** Radioopaque view of cement in abdominal tomography of the stomach

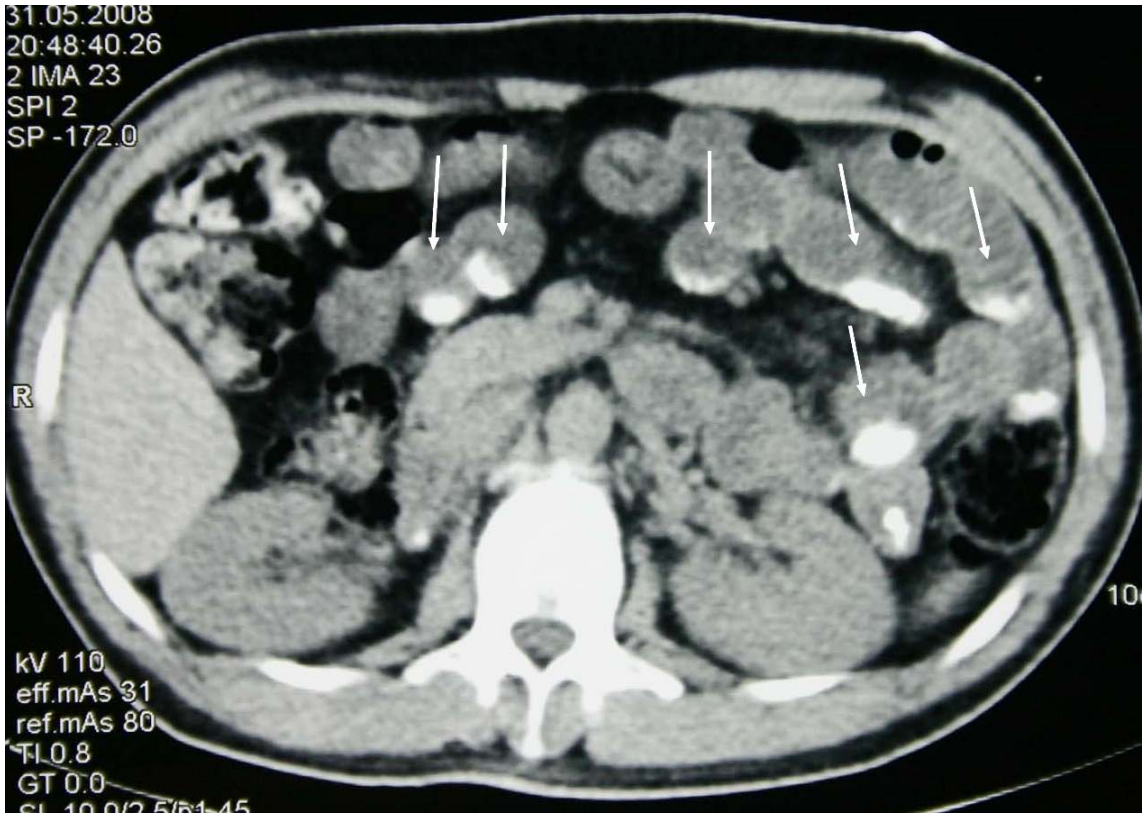


Figure 2. Radioopaque view of cement in abdominal tomography of the intestines