



## The Household Ceramic Hazard: A Case Report On a Penetrating Life Threatening Neurovascular Injury Caused by Ceramic Material

Noor Subah, Alan Sbar, Muhammad Haris Nazim and Izi D Obokhare\*

Department of Surgery, Texas Tech University Health Sciences, USA

### Abstract

There is little research available on the risks associated with injuries related to household ceramic objects. This study presents the case of a 49-year-old female injured by a ceramic trashcan after a fall in the bathroom. The ceramic shard pierced deep into her left medial gluteal area lacerating her external iliac artery and sciatic nerve. She required angio-embolization to stem the massive bleeding. To evaluate for a rectal and sigmoid injury a sigmoidoscopy was also performed. To adequately manage her gluteal wound, she underwent a laparoscopic diverting loop colostomy. This was reversed after her gluteal wound healed. Her long term sequela from the injury includes difficulty ambulating due to sciatic nerve injury.

### Introduction

There is a dearth of data available on the risks associated with injuries related to ceramic objects, thus it is important to analyze a common source of emergency department visits. An analysis of Emergency Department (ED) found that 234,094 people were treated in the ED for bathroom related injuries in 2008 [1]. This can be broken down further into the precipitating causes of injury and the subsequent cause of trauma. Of this amount, over 23,000 injuries were precipitated by exiting the shower and over 35,000 were diagnosed with lacerations. The results indicate that there is a high risk of injury in bathrooms.

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#### \*Correspondence:

Izi Obokhare, Department of Surgery,  
Texas Tech University Health Sciences,  
Center School of Medicine 1400 S  
Coulter St. Amarillo, TX 79106, USA,  
Tel: 806-414-9558; Fax: 806-354-5693;

E-mail: izi.obokhare@ttuhsc.edu

Received Date: 03 May 2019

Accepted Date: 10 Jun 2019

Published Date: 13 Jun 2019

#### Citation:

Subah N, Sbar A, Haris Nazim M, Obokhare ID. The Household Ceramic Hazard: A Case Report On a Penetrating Life Threatening Neurovascular Injury Caused by Ceramic Material. *World J Surg Surgical Res.* 2019; 2: 1134.

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The findings are further supported through a retrospective study by Sauter et al. [2] of the 280 injured patients, 235 (83.9%) suffered a direct trauma by hitting an object and 52 patients (18.6%) obtained a laceration. While it is not clear the causes of laceration, it can be inferred that the presence of a hard surface such as a glass or ceramic object as well as the presence of moisture increased the risk for severe injury after a fall in the bathroom.

### Case Presentation

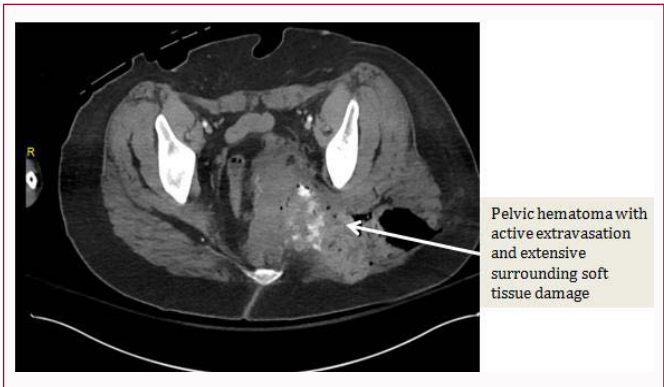
The patient is a 49 year old female who presented to ED with a 10 cm × 15 cm laceration on her left lateral gluteal and massive hemorrhage. She sustained the injury after falling off the toilet and landing on a ceramic trashcan. The ceramic trash can fell apart into several pieces, a large shard of ceramic pierced into her left mid gluteal region (Figure 1). At the scene, she lost a significant amount of blood because a tourniquet could not be applied due to the proximal anatomic location of the injury. The laceration measured 10 cm long × 5 cm wide × 8 cm deep and involved the gluteus maximus and the branches of the external iliac artery and vein and the sciatic nerve (Figure 2). Despite adequate pressure to the area and attempts to ligate the vessels, the bleeding from the area continued resulting in massive blood loss requiring transfusion of over two dozen units of blood products. She ultimately required angio-embolization of the external iliac branches. The CT images revealed a large sized pelvic hematoma with extravasation of contrast (Figure 3 and 4).

### Treatment

Given the nature and location of the injury, the patient was taken to the operating room immediately upon arrival for surgical wound exploration and packing with surgical gauze. The next day after complete resuscitation, she was evaluated for the presence of a rectal injury and for diversion of fecal stream to reduce contamination of the wound. She underwent a flexible sigmoidoscopy and a diverting colostomy. Further wound exploration revealed that the bleeding was emanating from deep within the wound. She was packed with sterile gauze and transported to the interventional radiology suite for angiography. Angiography revealed active extravasation of contrast from the



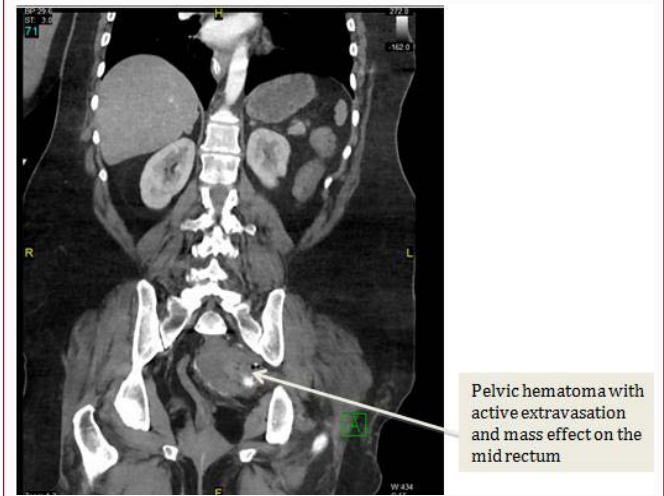
**Figure 1:** The shard of the ceramic trash can that pierced through the patient.



**Figure 3:** Pelvic CT revealing a hematoma and active Extravasation.



**Figure 2:** An Angiogram depicting the extravasation from the external iliac branches.



**Figure 4:** Abdominal CT revealing hematoma and extravasation along with mass effect on rectum.

branches of the external iliac artery; this was successfully managed with angio-embolization. Throughout this process, she required over 20 units of blood products due to the massive hemorrhage.

**Outcome and Follow-up**

The patient remained in the hospital for several days and was seen by a neurologist for her sciatic nerve injury. She subsequently was discharged home and was seen in the clinic multiple times for wound care. Complications related to the wound were managed with aggressive wound care and antibiotics. The patient also continued to experience pain and difficulty walking due sciatic nerve damage.

After the wound had healed, she underwent a minimal invasive loop colostomy closure after a normal colonoscopy. The patient was seen in clinic after the colostomy closure and was ambulatory with a cane due to her sciatic nerve injury. In the follow up period the patient struggled with mental health issues due to her history of major depressive disorder and chronic alcoholism.

**Discussion**

There are currently no major guidelines addressing the risk of ceramic or glass products, but it is important to consider the increased risk of injury when working with this type of material. Due to the high density of ceramic, it can become a deadly projectile that can puncture, lacerate and, at high velocities, macerate soft tissue and bone. Satyarthee et al. [3] reported a case of a transorbital penetrating cerebral injury that resulted from a ceramic stone. This injury led to herniation of the brain matter through the wound. The injury resulted from a piece of a knife sharpening stone that dislodged from an electronic rotator and penetrated the orbital roof.

To our knowledge, this is the first case report of a laceration of the gluteal neurovascular bundle due to a fall at home on a ceramic vessel. The patient underwent an extensive recovery period due to the laceration of her external iliac artery and damage to her sciatic nerve. Her recovery period was accelerated by a multi-disciplinary approach involving Trauma and Critical care, Interventional radiology, colorectal surgery and wound care management. Treating her initial injury similarly to a gunshot wound or a knife wound prevented further damage to surrounding structures and the demise of the patient. The ideal approach to a similar case would be angio-embolization and wound care.

The research available on injuries caused by ceramic or glass objects are limited; these objects are hazardous due to their density and ubiquitous nature in a home. As a result they have a great potential of causing severe life threatening injuries [1-3].

**Learning Points**

1. It is important to understand the potential risk of having ceramic or glass objects in the home especially in patients with high fall risks and locations in the home with decreased friction or wet surfaces. While these objects may cause low velocity injuries, they can have live threatening consequences.
2. Deep gluteal injuries have a potential for colonic or rectal perforation, as a result patients have to be evaluated adequately with endoscopic evaluation.

3. Treat injuries caused by ceramic objects similarly to those caused penetrating injuries. It is potentially more harmful to the patient to try and attempt to remove the penetrating object without the presence of a surgeon.

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