

Rhinoceros Horn: Hidden Spread Injury

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Abstract: A rhinoceros attacked and gored a breeding staff member with its horn. The staff member was gored in the upper right quadrant and he fell down. Upon arrival, he was in a state of pre-shock. Enhanced CT revealed hepatic rupture at the right lobe with extravasation. He required transfusion twice during hospitalization following urgent selective embolization. The patient was discharged on foot, after it had been confirmed that the area of hepatic injury had decreased in size on enhanced CT. Similarly to handle bar injury or horse kick injury, which are referred to as hidden spear injuries, the present case shows that the injuries caused by a rhinoceros horn attack have the potential to be severe or fatal, because the transfer of energy from the end of the horn to a small field can lead to internal organ injuries that are more severe than predicted.

Keywords: rhinoceros; liver injury; embolization

INTRODUCTION

In Japan, there have been no reports of traumatic injuries caused by rhinoceros attacks. Furthermore, we could not find any detailed reports on the traumatic injuries caused by rhinoceros attacks in the English literature. We herein report the case of a patient who experienced hepatic rupture after being gored by a rhinoceros horn.

CASE PRESENTATION

A twenty-three-year-old male staff member tried to place a rhinoceros in a cage. However, the rhinoceros attacked and gored a breeding staff member with its horn (**Figure 1**). The right side of his abdomen was gored and he fell down. The rhinoceros subsequently attacked him several more times with its horn; however, he managed to climb into a deep moat that had been built to prevent the animal's escape. The staff member was rescued and he was transferred to our department by an air ambulance. His medical and family history was unremarkable. Upon arrival, his Glasgow Coma Scale score was 15. He had a blood pressure of 120/90 mmHg, a heart rate of 105 beats per minute, a respiratory rate of 30 breaths per minute, and an SpO₂ of 100% with 5L per minute of oxygen. A physical examination revealed severe pain on the right side of his abdomen, as well as back, left neck and right hand swelling and tenderness. Focus sonography detected traumatic injury of Morrison's pouch. Enhanced CT revealed hepatic rupture at the right lobe with extravasation (**Figure 2**). Radiological examinations did not reveal any fractures of the neck, back or hand. A biochemical analysis revealed that the patient's aspartate transaminase (AST) level was 587 IU/L and his alanine transaminase (ALT) level was 581 IU/L, which was compatible with hepatic rupture. Tracheal intubation was performed under sedation due to the severity of the patient's hepatic rupture. Urgent

selective embolization of the right hepatic artery was performed. The patient's circulation remained stable during and after the interventional radiological procedure. He required transfusion twice on the 1st and 4th days of hospitalization. The peak AST and ALT levels were 2323 and 2344 IU/L, respectively, and occurred on the 3rd day of hospitalization. After embolization, he had a high fever of 39°C. Enhanced CT on the 5th day of hospitalization demonstrated hepatic necrosis and a small amount of biloma without peritonitis, which was thought to be the origin of the patient's fever. The patient was extubated on the 7th day of hospitalization, after the improvement of the patient's inflammation reaction and jaundice index and oral intake was started the following day. Enhanced CT on the 15th day of hospitalization revealed that the hepatic necrotic area was small but that the biloma had increased in size; however, the inflammation reaction and jaundice index continued to decrease; thus, the patient started rehabilitation. The patient was discharged on foot on the 27th hospital day, after it had been confirmed that the area of hepatic injury had decreased in size on enhanced CT. The photograph shows the same species of rhinoceros that was responsible for the attack on the patient in the present case.



Fig-1: A photograph of a rhinoceros

CT reveals hepatic rupture at the right lobe.



Fig-2: Enhanced CT on arrival

DISCUSSION

This is the first case to describe the details of a traumatic injury caused by a rhinoceros attack. Acharya *et al.* reported the patterns of human injury and death due to large mammals using the data related to attack events from a national survey of Nepal that was performed over a five-year period [1]. They showed that elephants and leopards were most commonly involved in attacks on people (in terms of attack frequency and fatal attacks). Although one-horned rhinoceroses and bears were involved in more attacks than Bengal tigers, tigers caused more fatalities than either animal. Their report did not describe the types of trauma that the patients suffered or provide detailed information about the causes of death. With regard to English records, an Internet search using the term, 'rhinoceros, human and trauma, revealed that two people in Umfolozi, South Africa experienced severe injuries due to a rhinoceros attack. However, this report did not reveal the details of the trauma (<http://www.iol.co.za/news/south-africa/second-person-gored-by-rhino-at-umfolozi-223471>). The present case had the potential to be lethal due to hemorrhagic shock due to hepatic rupture if embolization or transfusion had not been appropriately performed. Similarly to handle bar injury or horse kick injury, which are referred to as hidden spear injuries, the present case

shows that the injuries caused by a rhinoceros horn attack have the potential to be severe or fatal, because the transfer of energy from the end of the horn (which has a small cross-sectional area) to a small field leads to internal organ injuries that are more severe than predicted [2].

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