

# Impaled roadside guardrail in the neck: Case of a failed motorcycle stunt

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### ABSTRACT

Trauma is currently the leading cause of death in the age group 15 to 44 years globally, with road trauma now representing the sixth leading cause of death worldwide. We present a case of a young male, who was brought to the apex trauma centre of the province with a metallic roadside guardrail impaled in his neck up to his oral cavity, which had to be cut to transport him to the hospital. A meticulous local exploration resulted in the successful removal of the spiked guardrail, with no damage to critical structures. We discuss the paradigm changes in and the expertise required for the management of such penetrating neck injuries (PNIs). For family physicians, this case represents one of the wide variety of cases they will be called to help upon and administer prehospital care. Thus, utilization of principles of basic life support, recognition of the severity of road trauma cases, and ensuring urgency of referral by general practitioners are all critical.

**Keywords:** Helmet, motor vehicle, oral cavity, penetrating neck injury, road trauma

### Introduction

Trauma currently represents the leading cause of death in the age group 15 to 44 years across the world, while also causing significant morbidity and long-term disability in this population, considered to be the most economically productive of all. The most recent edition of Global Burden of Disease (GBD) study, published in 2018, estimates that road trauma has moved up to become the sixth leading cause of death in the entire age spectrum worldwide.<sup>[1]</sup> Road injury now also accounts for approximately a quarter of all deaths secondary to trauma, with 90% of this burden being shouldered by low- and middle-income countries.<sup>[2]</sup>

Penetrating neck injuries (PNIs), defined as the trauma to the neck resulting in a breach of platysma layer, characterize 5-10%

of all trauma cases. With mortality rates reaching upto 10%, PNIs represent a significant challenge in management, especially in lieu of the changing paradigm in classifying and treating such injuries.<sup>[3]</sup> We here present a technically challenging road trauma case of a PNI with roadside guardrail impaled in the neck.

### Case Report

A 20-year-old male was brought by the police to a university teaching hospital in northern India with a metal railing impaled into his neck, that had its tip protruding out of his oral cavity [Figure 1]. He was hemodynamically stable, other than being in great distress. As per the police, he had been doing hazardous motorcycle stunts, without wearing a helmet, when he had lost control and gotten hurled in the air. He had landed on the roadside guard-rail whose metal spike had penetrated his neck in the midline. Being stuck in this precarious position, he could not be helped by passer-byes and had to wait for the police to cut the railing, who then brought him to the hospital with no other prehospital care administered.

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**Figure 1:** (a and b) Initial presentation of the patient to the trauma centre with impaled roadside guardrail in the neck and oral cavity. The guardrail had been cut near the patient's neck to free him

During the initial assessment, the PNIs were identified to have occurred in Zone II above the hyoid bone, with the absence of other injuries, shock and neurological deficits. Postresuscitation, he was urgently shifted to the operating room. Under general anaesthesia with a tracheostomy, meticulous local exploration was done. This resulted in the successful removal of the spike with no damage to critical structures [Figure 2a]. Postoperative course was uneventful with tracheostomy tube removed on the eighth postoperative day and the patient being discharged on the next [Figure 2b]. Regular follow-up revealed no changes to his speech, swallowing and salivation, and no development of any salivary fistula. He is currently well, with no functional deficits.

## Discussion

PNIs can result in significant morbidity and mortality. Some can result in retained foreign bodies in the neck, as described here. It is ironic to witness how a tool of protection accidentally turned here into a cause of morbidity.

The classical zone-based classification of PNI was put forward in 1969, and soon became popular worldwide for guiding management. Zone I extended from the clavicles to the cricoid, Zone II from the cricoid to the base of mandible, and Zone III stretched between the angle of mandible and the base of skull. Because Zone II contained relatively unprotected structures, this approach prescribed a mandatory surgical exploration for zone II PNI, in contrast to the expectant management prevalent prior. After 50 years of guiding physicians in managing PNI, this traditional classification has now given way to the no-zone approach.<sup>[4]</sup> This is attributed to enhancement in imaging modalities, a better understanding of perioperative physiology, high negative neck exploration rates, and a poor correlation between external wound location and internal injuries.<sup>[5]</sup> In the no-zone approach, the neck is treated as a single entity, and the decision for operative management is contingent on multi-detector computed tomography with angiography (MDCT-A). This approach has been recently shown across various studies to provide superior outcomes, with clinicians doing routine MDCT-A in all stable PNI patients, including as recently described by Nowicki *et al.* in 2018.<sup>[4-7]</sup> This approach should be more widely known to trauma surgeons.<sup>[7]</sup>



**Figure 2:** (a) Meticulous intra-operative exploration and removal of impaled guardrail was done, with no injury to critical neurovascular structures. (b) Patient after postoperative recovery, is seen holding the removed metal railing

In this case, MDCT-A was not required due to the obvious requirement for neck exploration.

While fortunately, this patient survived in this road trauma, a large number of preventable deaths are caused globally by the same. An analysis of over 3300 cases of road trauma published in 2020 affirms the preventable nature of the same, further emphasising how important are high quality trauma management systems.<sup>[8]</sup> The latter recommendation should also be noted in the current case. This patient was operated in the Department of Trauma Surgery of King George's Medical University, one among less, one among less than ten such specialized departments in India, with considerable expertise possessed by the operating surgeons, highlighting the considerable resources needed to manage such a case without complications.

However, better prehospital care of trauma patients is critical. Of note is that pre-hospital cervical collar was not used here. Fortunately, this did not result in any grievous harm, since the mode of injury did predispose to a cervical spine injury. Finally, patient rehabilitation is important in such cases. Fortuitously, despite the injury to the oral cavity, here there was no post-operative disability in speech or swallowing.

Notably, this case highlights the significant value of wearing full-face helmets for motorcyclists which could have reduced the morbidity here, as evident in the considerable body of work demonstrating the decrease in facial injuries with the use of full-face type compared to other types.<sup>[9]</sup> Legislative measures are essential to translate this recommendation into large-scale change. For family physicians, this case represents one of the wide variety of cases they will be called to help upon and administer prehospital care. Thus, utilization of principles of basic life support, recognition of the severity of road trauma cases, and ensuring urgency of referral by general practitioners are all critical.

## Statement of human rights

All ethical procedures were duly followed and informed consent was taken. The patient cannot be identified by any part of the text or image.

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## Conflicts of interest

There are no conflicts of interest.

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