

# Autopsy Death Profile Due to Railway Injury in Mangalore, A Coastal City of South Karnataka- A Retrospective Analysis

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## Abstract

**Background:** Accident deaths is one of the most common types of deaths in India. In India railway related deaths are reported throughout the year. Fatal trains impacts cause extensive musculoskeletal injuries due to the nature of the object as well as the amount of force transmitted during impacts. The purpose of all accident investigation to take a positive step in correction of causation and to prevent such incidents in the future.

**Objective:** The aim of this study is to assess and learn demographic details, characteristics of the incident in fatal train crashes and recognize the injury profile.

**Methods:** This is a retrospective autopsy based study. We considered 59 cases of railway track related deaths in three years (2016-2018) conducted at Tertiary Care Hospital, mortuary, Mangalore and analyzed them statistically.

**Results:** The study showed most of the victims were men between 30-40 years of age. Most victims of incidents were pedestrians (72.9%). The circumstance of incident in the majority was while walking on side of railway track (39%). The highest number of fatalities 42.4 % were observed between 6 Am to 12 pm. Analysis as to cause of death in accidental circumstances revealed that multiple injuries (35.9%) followed by blunt trauma of head (33.3%) and in suicidal circumstances, death due to blunt trauma to head (40%) and decapitation (40%) were the most prevalent.

**Limitations:** The study needs to be done for longer duration and more detailed parameters in the railway track accidents.

**Conclusion:** The study established that majority of railway related deaths are accidental. and there is a requirement of awareness and implementing strict traffic laws to strengthen their safety for such preventable deaths especially among the commuters of train and among the pedestrians using railway level crossings.

**Keywords:** - Railway related death; Pattern of railway deaths; Accidental deaths.

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## Introduction

In India, deaths due to railway incidents are quite common and having the largest railway in the world which runs under a single management<sup>1</sup> Railway accidents have an implication in medical and legal implications of trauma due to railway incidents and traumatic disorders as a result of an accident<sup>1</sup>. The congestion and populated railway are mostly seen

in India and as being the cheapest mode of mode of transportation and thus, the possibilities of increase in such cases<sup>2</sup>. There are many cases reported where a person deliberately lie across the railway track or lie head on the track in order to meet self-destruction and hence the railway provides a convenient mode of suicides. The difficulty to differentiate death due crossing track, suicide or criminal violence, specifically in the absence of eyewitness<sup>3</sup>. Railway related injury is severe, instantly and mutilated where the cause of death is clear.

In absence of history, determining the way of death is challenging. The most common dilemma in such cases is death is accidental or due to suicide<sup>4</sup>. Approximately one percentage of all fatalities submitted for medico legal autopsies are due to railway related death. The aim of all accident investigations is to establish the cause of incidents.

Accidental deaths were the major circumstance of death in railroad deaths. The most common injuries seen in suicide were a transection of neck, chest injuries and traumatic amputations of extremities<sup>5</sup>. The other factors for death would be a train and automobile collision, an impact between train or a passenger hanging out of compartment doors who are sandwiched by trees, posts or electric poles<sup>6,7,8</sup>. To rule out criminal violence certain features deserves special observation, such as wheel marks on the body, dirt and grease contamination and manner of severance of tissues<sup>8</sup>.

Despite many causalities are there, in the largest railway network in India, there are many places where unprotected railroad crossing is to be seen. Many cases of suicide over the railroad are reported as causalities are generally considered to be accidental. Laying oneself in front of running train is a common method of suicide. Less often, the person may jump in front of high-speed train. Generally, in cases of railway traumas the body is grossly mutilated with presence of grease and dirt materials on body surfaces<sup>9</sup>. To simulate suicide or accident, sometimes criminals may put the dead body of homicide victim over the railway track and mislead the autopsy surgeon as well as investigating agency. Autopsy surgeon need to be careful and able to distinguish postmortem injuries from ante mortem ones if a dead body recovered from a rail track where the circumstantial evidence has to be ascertained. Based

on the crime scene investigation and autopsy findings the manner of death could be opined<sup>8</sup>. The present retrospective autopsy based study is carried out to prove patterns, socio-epidemiological features and other significant associated Co factors, manner of death and cause of railway related deaths.

## Materials and Methods

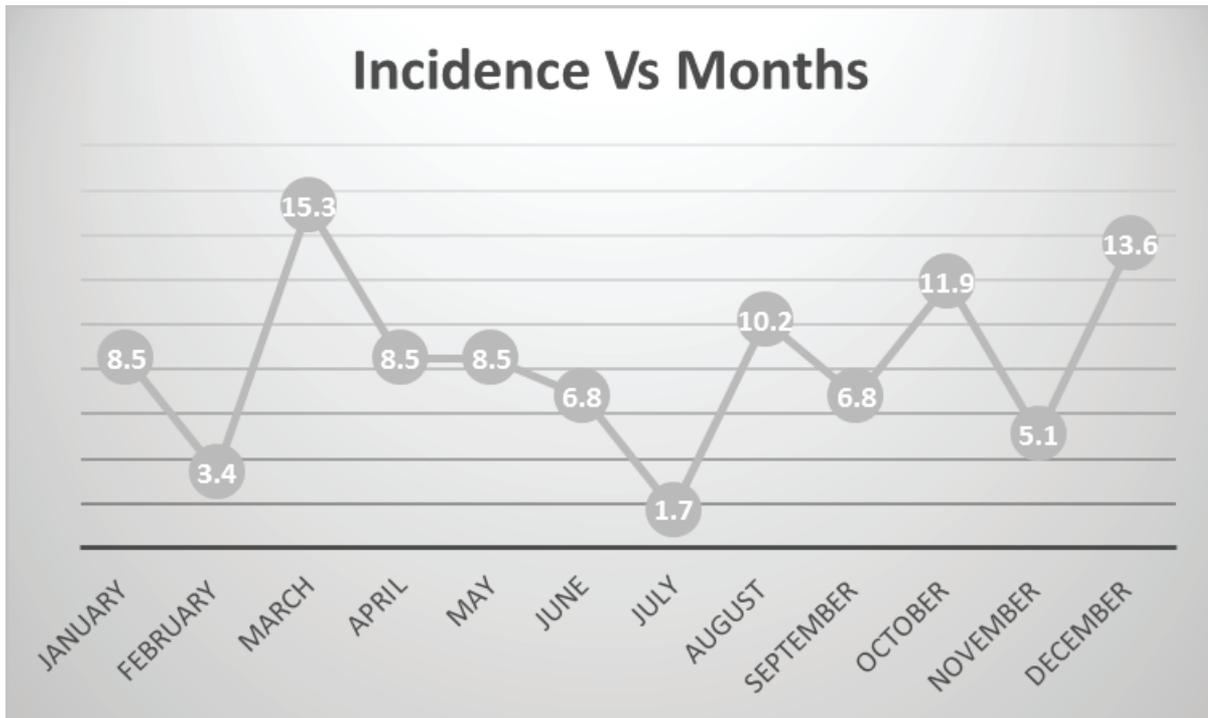
An autopsy based retrospective study was undertaken using postmortem reports of three consecutive years. Post mortem reports of deaths due to railway incidents referred to the Wenlock District Government Hospital, Mangalore for medico legal autopsy between January 1, 2016, to December 31, 2018, were considered. Of the total autopsy cases 2120, A total 59 cases of railway track related deaths were studied.

The cases included were those who had fatal injuries following impact with the train while trying to catch to train, while crossing across the railway track, walking on the side of railway track, or committed suicide on the track. Information obtained included demographic details of the victim, nature of the incident, time and incident, place of collision, external and internal injury distribution and cause of death and manner of death as determined by autopsy were extracted and maintained confidential. The data were entered in Excel sheet and analyzed using SPSS. Ethical Clearance from Institutional Ethics Committee (IEC KMC MLR 04-19/167) was taken before the study

## Results

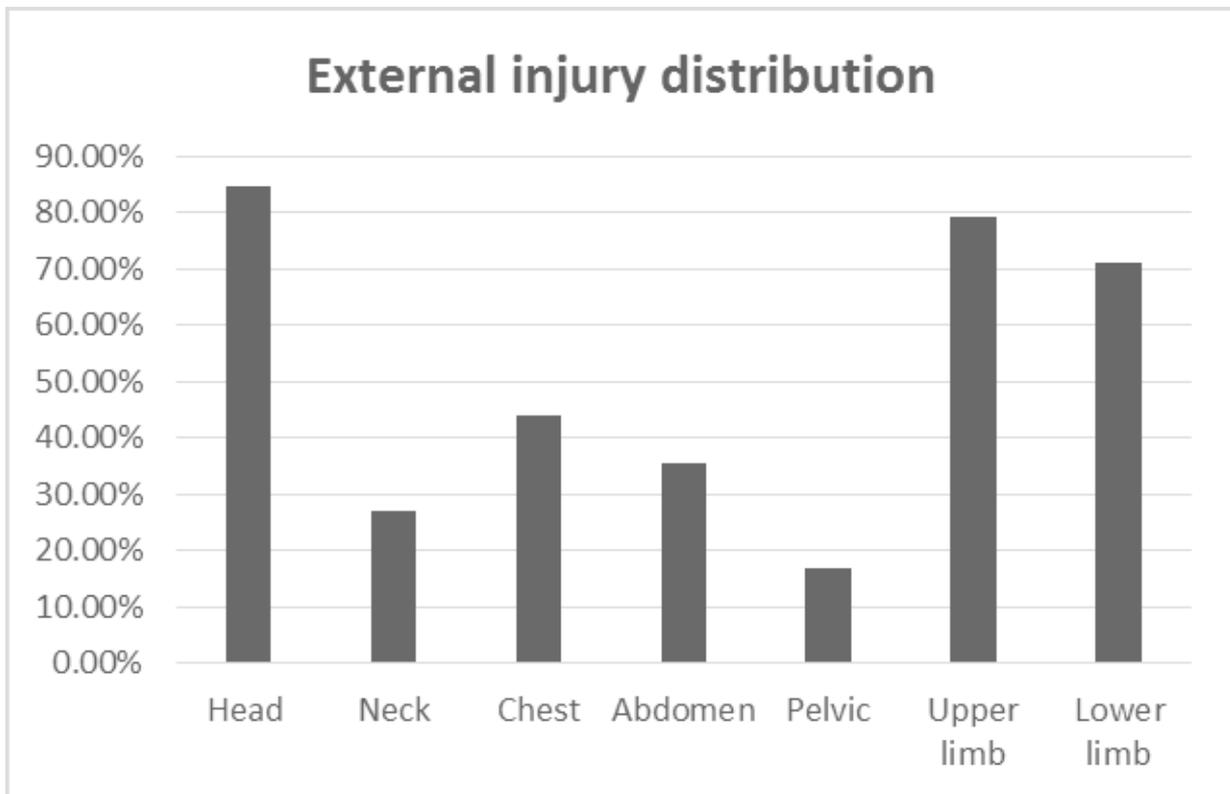
Among the total 59 cases of railway accidents most of the victims were men between 30-39 years (32.2%, n=19) of age. The circumstance of the incident in the majority was while walking on the side of railway track (39 %, n=23). Among the fatalities, the highest number of fatalities 42.4 % (n=25) was observed between 6 AM to 12 PM and in a day. Accidents occurred in the morning hours 6AM to 6PM. Suicidal deaths occurred in the late evenings, night and early mornings 6PM to 6AM.

Majority of railway track related deaths were prevalent in the month of March (n=9, 15%) and in month of December (14%). (**Fig.1**)

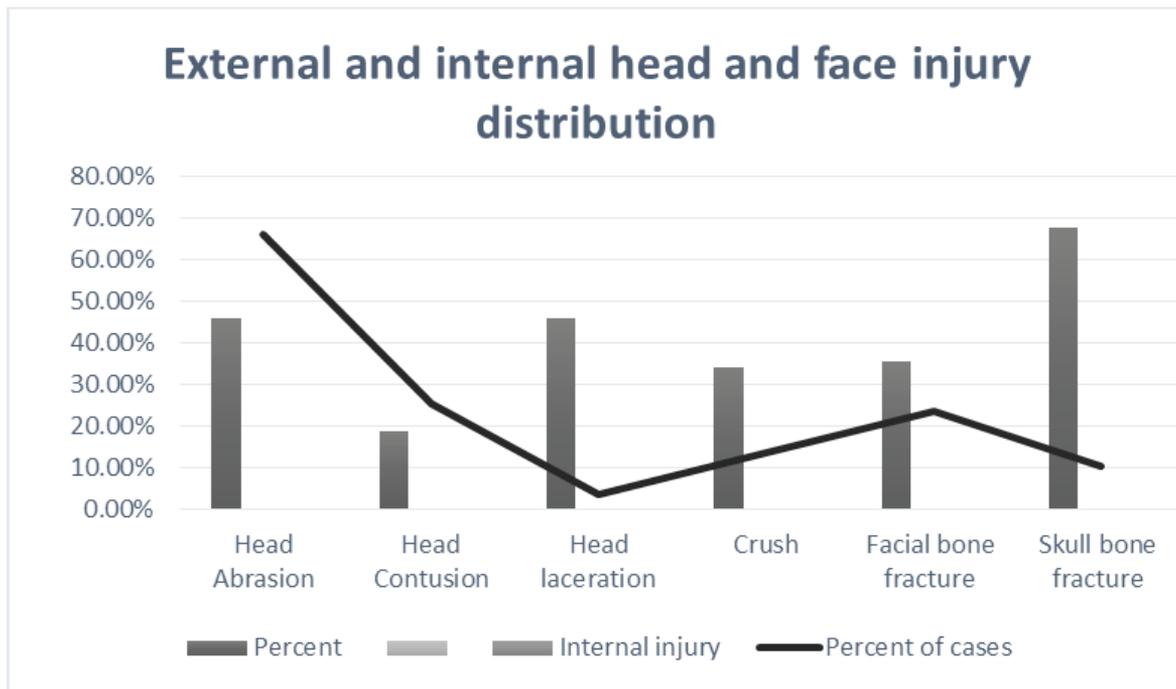


**Fig.1. Month wise incidence of railway deaths**

Among external injury head injury was the prominent injury observed in railway track deaths. In head injury abrasion and laceration were the most common injury. Skull fractures and facial injuries are common I the internal injuries in head and neck. Cervical vertebrae fracture (50%) and decapitation (50%) are the neck injuries observed in the railway deaths. (Fig.2 ,3)

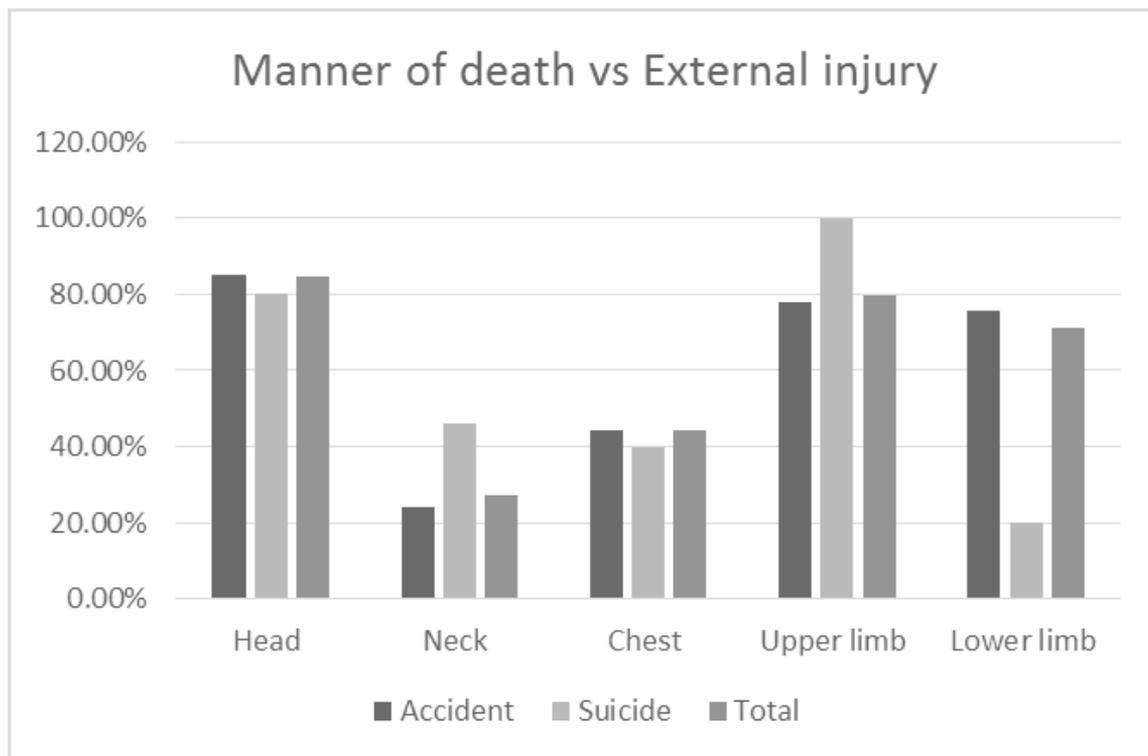


**Fig.2. Distribution of External injury among the victims.**



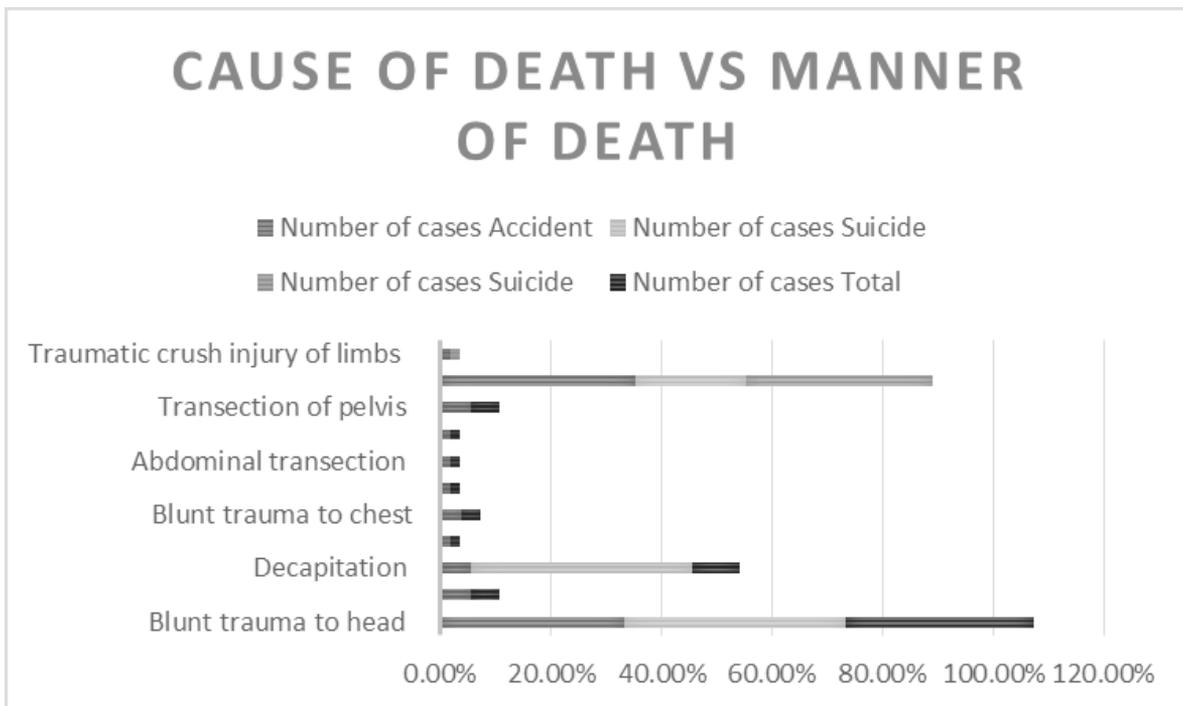
**Fig.3. Distribution of Internal injury to head, face among the victims.**

The study observed in all cases of suicidal deaths upper limb and head injuries were common and head, upper limbs, body were the prominent external injuries seen in accidental deaths. (Fig.4)



**Fig.4. Distribution of injury versus manner of death among the victims.**

Analysis as to cause of death revealed that multiple injuries (35.9%) was the most common cause of death in accidental death followed by blunt trauma of head (33.3%). In suicidal death blunt trauma to head (40%) and decapitation (40%) were the most prevalent cause of death. This was statistically significant (Fig.5)



**Fig.5. Distribution of Cause of death versus Manner of death among the victims.**

**Discussion**

The present study understands vital information like the main circumstances, associated factors and other confounding factors from the railway related death profiles. The practical difficulties of history obtained from bystanders and other eyewitnesses, reliability about accurate history is an issue with railway accidents and suicides. Correlating circumstance by corroborating the injury profile with the given history is main task of forensic practitioners. Most of medico legal issues can be addressed by thorough investigation of external examinations, internal examinations, documentation and interpretation of injury patterns along with a crime scene visit is an important part of autopsy examination

The most vulnerable victims were in the age group between 30-39 years. The preponderance of this age group is mainly due to mobile behavior of this age group. This was consistent with other studies. (5,8) The majority of the victims were males again larger section of males commute and are mobile. In several studies male prevalence has shown. (5,8) 94 % of accidental deaths occurred in male, 80% of cases of suicide deaths occurred in male, 20% of suicidal cases in women and 6% of accidental deaths were in women. These findings

are similar to an another study<sup>10</sup>. Differences between men and women indicate sex specific inheritance to suicidal behavior.

In most cases of railway incidents, victims were pedestrians. This is consistent with another study<sup>8</sup>. Most incidents took place while walking along the sides of the track (39%) than crossing railway tracks (30.5%) was contrary to a study<sup>10</sup>. However the findings matched with another study observed by the author<sup>11</sup>. Usage of railway tracks frequently as a path by pedestrians in absence of bridges, alternative roads and in the absence of road crossings. Negligence in personal safety could also be another reason<sup>12</sup>. passenger cases out of 71 cases died by falling from the train is similar to another study<sup>8</sup>.

The majority of accidents took place during the morning time (6-12.59p. m.), reasons could be due to work and for other activities most boards to train or rush to reach working area on time. Thus, the carelessness of the pedestrians might be the one of the leading Co factors.

43% of accidental deaths occurred in the morning time and suicidal deaths occurred in 40 % of midnight cases and in 40% of the morning cases but contrast to another study. <sup>10</sup> however correlates with a study<sup>8</sup>. This

could be reasoned by the fact victims commit suicide after family goes to sleep and while they are hurrying to the workplace so that there is no help to rescue the offender.

Most of railway deaths (15%) occurred in the month of March followed by August month (14%). This may be reasoned due to seasonal variation among the incidents observed similar to the study<sup>11</sup> In 17% of cases ethanol was detected. This was contrasted with a study done by another author<sup>8</sup>. However, this was consistent with findings of other authors. This is reasoned by consuming some predisposing agents which can prepare to perform this act.

On the external examination head injury (87.2%) was the most common injury seen. Abrasions were mostly observed in upper limbs (50.2%) and lower limbs (45.8%). This was consistent to study done by another study<sup>8</sup>. Lacerated wounds were mostly distributed on the head region (45.8%) and lower limbs (45.8%). In 23.2% cases contusion was seen on the chest region. This was inconsistent to study<sup>8</sup>. Decapitation was seen in 40% of suicidal cases and in 7.4% of accidental deaths. This was contrast with the study<sup>5</sup>

The present study showed a large proportion of accidental deaths (91.5%) compared to suicidal deaths (8.5%). There were no homicidal deaths. A similar finding was observed by other studies<sup>5,8</sup>. However, these findings were contrary to the study carry out in New York, where suicide outnumbered to accidents<sup>12</sup>. Accidental deaths are often preventable with a great deal of good involvement of public and investigating authorities as seen in other studies.

The most common of cause of death in accidental deaths were multiple injuries (35.2%), consistent with previous study<sup>5, 8</sup> and the common cause of death in suicide were blunt trauma to head (40%) and decapitation

### **Conclusion and Recommendation**

This study revealed that the majority of railway related deaths are accidental. Decapitation and blunt trauma to the head were common in suicidal deaths. Death due to railway incidents will be preventable by creating public awareness and implementing strict traffic laws. Public attitude for such preventable deaths

could be improved through education, awareness drive, especially among the commuters of train and among the pedestrians using railway level crossings

The general attitude towards following the rules and regulations need to be improved and stricter enforcement can be made by law enforcement officials. There is a need to display these rules and penalties, so the law breakers are worried and aware of these rules at the railway stations and other areas notified and to generate a more eye-catching surroundings, enhanced public education messages are ingrained in the public.

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**Conflict of Interest:** -None declared

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