

Electric-scooter-related facial injuries in children: A Christmas case series

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Abstract

Introduction

Electric-scooters (e-scooters) were a popular Christmas gift for children and teenagers in 2023. These vehicles can reach speeds of up to 40km/hr and often travel within main traffic lanes. Accidents can result in significant trauma, including soft-tissue facial injuries.

Cases

We present 4 cases involving teenagers, who were referred to the plastic surgery service with facial abrasions and lacerations as result of e-scooter accidents in the period after Christmas 2023. Cases 1, 2 and 3 describe adolescent patients who fell from an electronic scooter on a main road. Case 4 describes a 13-year-old female who fell from an electronic scooter in a woodland area.

Outcomes

All patients required scrub of facial abrasions and removal of debris under general anaesthetic. These wounds were subsequently managed in an outpatient dressing clinic and took an average of 23 days to heal. Three of the patients also required suturing of facial lacerations. One patient required splinting of teeth and another required dental intervention for a fractured tooth.

Discussion

We observed a cluster of facial injuries related to the use of new e-scooters in the early months of 2024. All patients referred to the service required procedures under general anaesthetic and follow-up in the dressing clinic. Newly-introduced legislation, which limits e-scooter use to those aged 16-years and over, is welcomed.

Introduction

Electric-scooters (e-scooters) are two-wheeled vehicles with a small standing platform that are propelled by an electronic motor. They are intended for use by one person only, can reach speeds of up to 40km/hr and often travel within main traffic lanes¹. Road traffic accidents involving e-scooters can result in significant trauma, including long bone and facial fractures, as well as life-threatening head injuries². It is reported that children experience a greater rate of fractures and polytrauma from e-scooter injuries when compared to the adult population³. In spite of this, e-scooters have been noted as potentially popular Christmas gift for Irish children in recent years⁴.

With a view to raising awareness of e-scooter trauma in Irish children, we report a cluster of four e-scooter-related soft tissue facial injuries that were referred to our paediatric plastic surgery service in the weeks after Christmas 2023.

Cases

Case 1

A 16-year-old female fell from an e-scooter on to the main road after crashing into a footpath. The patient was unsupervised, was not wearing a helmet and was riding the scooter with a friend, who also sustained injuries (Case 2, below). The patient had abrasion injuries to bilateral cheeks, forehead and nose, which required scrub under general anaesthesia to clean and remove debris. The patient remained inpatient for one day post-operatively for pain management. She was followed up in the dressing clinic for 21 days and was referred to occupational therapy for scar management.

Case 2

A 15-year-old female fell from an e-scooter onto the main road after crashing into a footpath. The patient was unsupervised, was not wearing a helmet and was riding on a scooter with a friend who also sustained injuries (Case 1, above). At presentation, the patient had abrasions to the forehead, left cheek, nose, and right hand, as well as a full-thickness upper lip laceration with associated tissue loss and alveolar fracture. The patient underwent a scrub of facial abrasions, lip laceration repair and dental assessment with tooth splint placement in theatre on the day of review. She remained inpatient for one night. During admission, the patient was reviewed by the general paediatric team for a head injury and the orthopaedic team for a right wrist sprain. Both CT brain and CT wrist showed no acute injuries. The patient was followed up in the dental clinic at one week for splint removal and then advised to attend her local general dental practitioner for follow up. She attended the plastic surgery dressing clinic until facial wounds were re-epithelialised at 29 days. The patient was referred to occupational therapy for scar management.

Case 3

A 15-year-old male fell from an e-scooter on the main road. He was unsupervised and was not wearing a helmet at the time. He sustained facial abrasion injuries to the forehead, nose, chin and right cheek with associated tissue loss in the philtrum and right cheek, a laceration to right knee and a fractured tooth. The patient underwent scrub of facial wounds and suturing of the knee laceration under general anaesthetic. He was assessed by the dental team for a fractured tooth, which was managed conservatively given its small size and absence of symptoms. The patient was discharged on the same day and was followed up in the dressing clinic for 20 days and referred to occupational therapy for scar management. He was followed up by the dental team at 2 weeks and discharged to community dental service for follow up and definitive restoration of the fracture.

Case 4

A 13-year-old female fell from an e-scooter while riding in a woodland area. She was supervised by a parent at the time of the accident and was wearing a helmet. The patient sustained abrasions to left cheek, chin and nose, with superficial skin loss at the philtrum, as well as superficial abrasions to bilateral hands and the right knee. The patient underwent a scrub of facial abrasions as a day case procedure and was followed up in the dressing clinic for 22 days. The patient was referred to occupational therapy for scar management.

Results

We have observed a cluster of paediatric facial injuries related to e-scooter use. All patients required a procedure under general anaesthetic and an average of 23 days outpatient follow-up. In three out of four cases, no helmet was worn and the e-scooter was being used on a main road. All patients presented with a similar pattern of injury involving multiple facial abrasions +/- tissue loss that required a prolonged period of dressings. Obvious dental injuries were a feature of two of the four cases. The management and follow-up of these patients involved multiple teams including paediatric emergency medicine, plastic surgery, paediatric dentistry, paediatrics, orthopaedic surgery and occupational therapy.

Discussion

The increasing use of e-scooters globally has resulted in a rise in related injuries, particularly maxillofacial trauma. The first Irish series was published in 2021 and updated in 2025, with both studies describing these injuries in the adult population⁵. In their 2024 study, Buckley et al. reported a series of 147 e-scooter injuries presenting to a single emergency department in Dublin over a 12-month period⁶. The authors described the injuries as a “new emerging high-energy trauma”⁶. The purpose of the current study was to draw attention to the risk associated

with e-scooter use in children and to endorse the recent legislative measures, which have been introduced to ensure safety, address potential risks, and manage the impact of e-scooters on public spaces in Ireland.

The most concerning feature observed in the current series was patient age - all patients were aged 16 years or younger and had received their e-scooter as a Christmas gift. The Road Traffic and Roads Act 2023, which was introduced in May 2024, has increased legislation around the use of e-scooters and stipulates that users must be over 16 years of age⁷. Interestingly, the minimum age of legal e-scooter use varies across Europe, with Italy and Germany setting an age limit of 14 years and France allowing their use in children as young as 8 years^{8,9}. It is hoped that new legislation in this country will have a direct impact on the use of e-scooters by young people and will deter parents from choosing them as gifts for under 16s.

In addition to age limits, other risk factors that we observed have been directly addressed in the 2023 legislation. One of our patients (Case 2) was using an e-scooter with a friend - the specific banning of passengers on e-scooters in the Road Traffic and Roads Act is therefore welcomed. Furthermore, the use of e-scooters on footpaths and in pedestrianised areas, as reported in the Case 4, has also been restricted under the new legislation.

Although not a legal requirement under the 2023 legislation, helmet-use is often cited as a risk-mitigating strategy. In 3 of the 4 cases discussed, the child was not wearing a helmet while riding an e-scooter. This is a common finding in previous literature on the topic, with McGalliard et al reporting that 97% of paediatric patients who presented to their trauma unit with e-scooter injuries were not wearing a helmet⁹. A large systematic review and meta-analysis by Stassen et al. found that wearing a helmet while riding a bicycle decreased the risk of sustaining a maxillofacial injury in the event of a bicycle accident by over one third¹⁰. As regards helmet type, Wu et al. found that patients wearing a full-face helmet were about three times less likely to have sustained injury to the face, compared to those wearing another type of helmet¹¹. An interesting counter-argument to helmet use is that it has been associated with increased risk-taking behaviour. In their 2015 study, Thompson and Carlson reported helmet-use as an independent predictor of increased risk-taking behaviour in snow-boarders and skiers¹². Gamble and Walker used eye-tracking experiments to demonstrate that risk-taking behaviour subconsciously increased when wearing a helmet as opposed to a baseball cap¹³. In spite of these findings, we do feel that the benefit of helmet-wearing outweighs the risk and given the injury pattern described in the current series, we would advocate for the use of full-face helmets in those legally entitled to use an e-scooter.

A final observation was that all injuries in the current series occurred while using privately-owned e-scooters, a finding which is consistent with McGalliard et al's 2022 review¹¹. The Road Traffic and Roads Act 2023 allows for the development of e-scooter rental schemes, with

local authorities able to establish licensing and contractual agreements with operators⁷. Commercial e-scooter rental is usually facilitated via online applications, which are likely to be difficult for those under 16 years to access as rental requires proof of age, credit card details and/or a driver's license. Furthermore, rental e-scooters tend to have built-in speed limits in keeping with local legislation, thereby optimising safety of use.

We observed a cluster of e-scooter-related facial injuries after Christmas 2023, a period that just predated the enactment of the Irish Road Traffic and Roads Act 2023 in March 2024. It is encouraging that a significant fall in maxillofacial trauma related to e-scooter accidents was observed in Helsinki, Finland following the introduction of legislative measures surrounding their use¹⁴. In contrast, Watson et al. at the University of Queensland, Australia, reported no reduction in serious head, neck and facial injuries in the 6-month period following introduction of legislative change enforcing safer riding conditions for e-scooters¹⁵. We hope that this report will raise awareness of the risk associated with e-scooter use in children. The impact of legislative change in Ireland on e-scooter-related trauma in children remains to be seen.

Declaration of Conflicts of Interest:

None declared.

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