Hand injury in a child — a rare adverse effect of rear seatbelt use

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INTRODUCTION

Front seat belts in moving vehicles have proven advantages (McCarthy, 1989) and there have been recent changes in the law to regulate and encourage the use of rear seat belts (Motor Vehicles Regulations, 1989). We report an unusual complication of the use of static rear seat belt involving a child.

CASE REPORT

A 3-year-old girl with post-encephalitic mental and speech retardation was travelling at night with her parents, restrained in the rear seat by a static seat belt. After travelling some distance, a bang was heard followed by a cry from the girl who had been asleep. The parents could find nothing wrong when they stopped, but as the journey continued the child became more and more restless. Subsequently, in better light, blood was noticed on the child's left hand, which was swollen.

On presentation to a peripheral GP Accident & Emergency unit, avulsion of her left index finger tip was noted, with marked swelling of her hand. Radiographs were not possible so she was referred to the General Infirmary at Leeds for management. On re-examination two injuries were found. The girl was noted to have bruising across her lower abdomen and left thigh consistent with sudden traction of a seat belt, and marked swelling of her left palm together with avulsion of her index finger tip. Radiographs revealed a fracture of the proximal phalanx also (Fig. 1).

The mechanism of these injuries was then established: the static rear seat belt had been applied with excess length trailing outside the rear door. This loop had caught on the moving rear wheel and suddenly had been pulled taut. It is probable

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Fig. 1 Radiograph demonstrating fracture of proximal phalanx index finger.

that the sleeping child had a loop of seat belt around her left hand, resulting in her injury. Her inability to communicate confused the subsequent events before both the mechanism and nature of the injury could be finally established.

The fingertip injury and proximal phalangeal fracture were treated conservatively with a good result, and the lower abdominal bruising resolved spontaneously over several days.

DISCUSSION

The pattern and severity of injuries following road traffic accidents have been greatly modified by the advent of seatbelts (Christian *et al.*, 1989). This protection of occupants from injury is currently being extended to rear seat passengers as a result of legislation which came into force in July 1989 (Motor Vehicles Regulations, 1989). However, some form of injuries such as neck sprains, chest wall injuries and torsional injuries of the head and neck have increased (Banerjee, 1989). We report on a rare injury that highlights two factors regarding rear seat belt use.

The first factor relates to the design of the seatbelt itself. The older static belt remains difficult to adjust, and therefore is often worn incorrectly adjusted, as in the case we describe. An inertia reel belt would be unlikely to leave an external loop, though must also be fitted correctly across both the lap and the shoulder to adequately restrain a child.

The second factor relates to the fact that children, and others incapable of correctly using the device themselves, remain the responsibility of the parent and car driver. Safe application of appropriate restraining devices must not be left to the child, especially if handicapped. The strict legal position is that it remains the responsibility of the car driver (Motor Vehicles Regulations, 1989).

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