

Forearm fracture due to the release of an automobile air bag

A case report

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A 32-year-old man was the driver of a car which on a slippery road collided with another car at approximately 40 km/h. He had fastened his seat belt and only had his left hand on the steering wheel at the time of the collision. He held his left arm on the top of the steering wheel with his elbow flexed; his right hand was on the gear lever in an attempt to change down. At collision, the air bag in the steering wheel was inflated and the patient felt an abrupt, intense pain in his left arm. No other personal injuries were reported, and the cabin of the patient's car was not damaged.

16 years earlier he had an accident and sustained fracture to his left radius, treated by radial head excision. He had no loss of function or pain afterwards.

The patient was admitted to our hospital with shaft fractures of both forearm bones. Open reduction and internal plate fixation of both radius and ulna were performed. No neurologic or vascular damage was found either before or after surgery. The patient regained normal motility after 8 weeks.

Discussion

Air bags are located in the hub of the steering wheel and consist of a bag which is released at frontal and oblique collisions at speeds above 30 km/h.

A priming composition triggers off a chemical reaction which, in 54 msec, fills the air bag with nitrogen. When fully inflated, the bag cushions the impact of the steering wheel, thereby protecting the driver's face and trunk (National Highway Traffic Safety Administration 1986).

Air bags have proved their efficiency in preventing personal injuries and have reduced injury rates by about one quarter as compared to the use of manual seat belts in new car models (Zador and Ciccone 1993). However, cases of injuries caused by the

system have been reported: a serious hand injury (Smock 1992), skin abrasions and eye injuries (Ingraham et al. 1991, Larkin 1991). An investigation of volunteers showed only minor injuries, which all healed (Schneider et al. 1991).

In the U.S.A., the National Highway Traffic Safety Administration has reported 18 cases of air bag-related injuries. It is recommended that small children should not be placed in the front passenger seat in baby chairs if air bags have been installed (Öström 1993).

The extent of the injury in our case may be due to the patient's earlier fracture of the radius. However, the driver would not have been injured if his car had no air bag. He had buckled his seat belt and in this particular case it would have been sufficient to prevent injuries. The triggering system seems too sensitive in some cases.

References

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